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10 CFR 50.90

TMI-13-033
April 10, 2013

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

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

Subject: Three Mile Island Nuclear Power Station, Unit 1, Technical Specification Change Request 352, Revise Technical Specification 3.14.2 and the Licensing Basis Flood Hazard contained in the Updated Final Safety Analysis Report

References:

1. Exelon Generation Company, LLC "Response to March 12, 2012, Request for Information Enclosure 2, Recommendation 2.1, Flooding, Required Response 2, Flooding Hazard Reevaluation Report," dated March 12, 2013.

2. NUREG/CR-7046, "Design-Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America," published November 2011.

3. NRC NCV 05000289/2011005-05, "Failure to Identify a Non-Conservative Technical Specification following Revison to River Stage Discharge Analysis."

4. U.S. Nuclear Regulatory Commission Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety," December 29, 1998.

5. NRC URI 05000289/2011005-04, "Adequacy of Flood Protection without Consideration of Wind Generated Wave Activity."

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) requests an amendment to Renewed Facility Operating License No. DPR-50 for Three Mile Island Nuclear Station, Unit 1 (TMI, Unit 1).

To support the TMI, Unit 1 Response to NRC Request for Information 10 CFR 50.54(f) letter regarding insights from the Fukushima accident (Reference 1), an external flood hazard reevaluation was conducted in accordance with NUREG/CR-7046 (Reference 2). The proposed revision of the TMI, Unit 1 Technical Specification (TS) and the Licensing Basis Flood Hazard are consistent with the results of the external flood hazard reevaluation.

This License Amendment Request (LAR) proposes a revision of TS 3.14.2 to require TMI, Unit 1 to be placed in HOT SHUTDOWN within 2 hours after river level reaches 300 feet elevation. TS 3.14.2 was identified to contain an error with respect to the implementation of flood protection actions (Reference 3). TMI, Unit 1 has implemented administrative controls, in accordance with

NRC Administrative letter 98-10 (Reference 4), to apply revised action timing until the NRC completes its review and approval of this proposed amendment.

This LAR also proposes to replace the Licensing Basis Flood Hazard contained in the UFSAR, in its entirety, with the hazard determined in accordance with NUREG/CR-7046. This change will resolve a recent issue regarding the adequacy of the flood protection licensing basis (Reference 5).

Attachment 1 provides the evaluation of the proposed changes. Attachment 2 provides the existing TS page markups. The TS Bases markups are also provided (for information only).

There are no regulatory commitments contained in this letter.

The proposed changes have been reviewed by the TMI, Unit 1 Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the EGC Quality Assurance Program.

EGC requests approval of the proposed amendment by April 10, 2014. Once approved, the amendment shall be implemented within 60 days of issuance.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), EGC is notifying the Commonwealth of Pennsylvania of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

If you have any questions or require additional information, please contact Wendy E. Croft at (610) 765-5726.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 10th day of April 2013.

Respectfully,

Michael D. Jesse
Director, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments:
1. Evaluation of Proposed Changes
2. Proposed Technical Specification and Technical Specification Bases (for information only) Pages (Mark-Up)

cc: USNRC Region I, Regional Administrator
USNRC Project Manager, TMI, Unit 1
USNRC Senior Resident Inspector, TMI, Unit 1
Director, Bureau of Radiation Protection, PA Department of Environmental Resources
Chairman, Board of County Commissioners, Dauphin County, PA
Chairman, Board of Supervisors, Londonderry Township, PA
R. R. Janati, Commonwealth of Pennsylvania

ATTACHMENT 1

Evaluation of Proposed Changes

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

Subject: **Three Mile Island Nuclear Power Station, Unit 1, Technical Specification Change Request 352, Revise Technical Specification 3.14.2 and the Licensing Basis Flood Hazard contained in the Updated Final Safety Analysis Report**

1.0 SUMMARY DESCRIPTION

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (EGC) is requesting an amendment to Renewed Facility Operating License No. DPR-50 for Three Mile Island Nuclear Station, Unit 1 (TMI, Unit 1).

To support the TMI, Unit 1 response to the NRC request for information regarding insights from the Fukushima accident (References 6.1 and 6.2) an external flood hazard reevaluation was conducted in accordance with NUREG/CR-7046 (Reference 6.3). The proposed revision of the TMI, Unit 1 Technical Specification (TS) and the Licensing Basis Flood Hazard are consistent with the results of the external flood hazard reevaluation.

This License Amendment Request (LAR) proposes a revision of TS 3.14.2 to require TMI, Unit 1 to be placed in HOT SHUTDOWN within 2 hours after river level reaches 300 feet elevation.

This LAR also proposes a revision to replace the Licensing Basis Flood Hazard contained in the UFSAR, in its entirety, with an analysis performed in accordance with NUREG/CR-7046. This change will address a recent issue regarding the adequacy of the flood protection licensing basis (Reference 6.4).

2.0 DETAILED DESCRIPTION

2.1 Technical Specification 3.14.2

This proposed amendment revises TS 3.14.2 to eliminate the reference to the river flow rate for the specified river level and adds margin to ensure that reactor shutdown is completed before river level exceeds the protection of the dike. Specifically, the proposed amendment reduces the river stage at which actions must be taken from 302 feet to 300 feet. In addition, the proposed amendment conservatively modifies the action at that river stage to require placing the unit in HOT SHUTDOWN within 2 hours as opposed to the current requirement of placing the unit in HOT STANDBY without any time constraint.

The proposed TS and TS Bases changes are:

- The title of TS 3.14.2 is revised to state, "OPERATING LIMIT FOR FLOOD." The "Table of Contents" on TS page ii is updated accordingly.
- The "Applicability" statement of TS 3.14.2 is revised to state, "POWER OPERATION or HOT STANDBY."
- The "Objective" statement of TS 3.14.2 is revised to state, "To define the action taken in the event river elevation challenges the flood protection dike."
- The "Specification" statement of TS 3.14.2.1 is revised to state, "If the river level at the River Water Intake Structure reaches 300 feet elevation then the unit will be placed in HOT SHUTDOWN within 2 hours."
- The TS BASES will be revised to reflect the requirement of a plant shutdown before the flood level exceeds the protection of the dike, the revised river elevation at which action is taken, and the revised action to place the unit in HOT SHUTDOWN. The Bases revisions are being provided for information only.

A markup of the proposed TS changes are provided in Attachment 2. The TS Bases markups are also provided (for information only).

2.2 UFSAR Licensing Basis Flood Hazard

This LAR proposes to replace the licensing basis flood hazard contained in the UFSAR, in its entirety, with the hazard determined in accordance with NUREG/CR-7046. NUREG/CR-7046 uses the hierarchical hazard assessment (HHA) approach to demonstrate that structures, systems, and components (SSCs) important to safety of a nuclear power plant are adequately protected from the adverse effects of flooding. The HHA is a stepwise, progressively refined series of analyses that is aimed at demonstrating that the SSCs important to safety are adequately protected from the adverse effects of severe floods expected at the site.

3.0 TECHNICAL EVALUATION

3.1 Technical Specification 3.14.2 Background

On July 11, 1973, the Atomic Energy Commission (AEC) issued the Safety Evaluation Report (SER) (Reference 6.5) for approval of TMI, Unit 1 operations. Section 3.4, "Flood Design Criteria," states that the "design criteria for high water levels due to a flood on the Susquehanna River and the protection for the plant are covered in Section 2.4. We find the criteria acceptable." The design criteria described in the Reference 6.5 SER Section 2.4 is described below to give insight into the design and purpose of TS 3.14.2.

Section 2.4.1, "Hydrologic Description," in the Reference 6.5 SER describes the design basis of the levee system around the plant, and that emergency operation plans allow for shutdown and maintenance of safe shutdown for floods greater than the levee design flood.

> "A hypothetical flood with a maximum runoff rate of 1,100,000 cubic feet per second (cfs) has been used to design the levee system around the plant. In addition, emergency operation plans will allow shutdown and maintenance of safe shutdown for floods greater than the levee design flood up to the [Probable Maximum Flood (PMF)] of 1,645,000 cfs (1,600,000 cfs discharge at Harrisburg)."

Section 2.4.7, "Technical Specifications and Emergency Operation Requirements," in the Reference 6.5 SER states the action to be taken in TS 3.14.2.

> "For floods greater than the levee design flood (1,100,000 CFS) operation will be terminated, and the plant will be placed in an emergency shutdown and cooldown condition."

The Reference 6.5 SER was the basis for the original TS 3.14, issued on April 19, 1974 (Reference 6.6). TS 3.14.2 was added to require a plant shutdown before the flood level exceeded the height of the dike protection. The original TS 3.14.2 remains unchanged from the 1974 wording with the exception of the "References" which were revised by administrative License Amendment 157 on September 25, 1990 (Reference 6.7).

On September 26, 2011, a revision of the TMI, Unit 1 river stage discharge analysis was completed. The revised analysis predicted a river water stage of approximately 300 feet at the River Water Intake Structure with a corresponding river flow rate of 1,000,000 cfs.

On March 12, 2013, in response to an NRC request for information 10 CFR 50.54(f) letter regarding insights from the Fukushima accident (Reference 6.1), TMI, Unit 1 submitted a summary of the results of an external flood hazard reevaluation (Reference 6.2) conducted in accordance with NUREG/CR-7046 (Reference 6.3). This reevaluation confirmed the previously predicted water level of approximately 300 feet at the River Water Intake Structure with a river flow rate of 1,000,000 cfs.

3.2 Technical Specification 3.14.2 Evaluation

TS 3.14.2 Specification requires that TMI, Unit 1 be placed in a hot standby condition "if the river stage reaches elevation 302 feet at the River Water Intake Structure, corresponding to 1,000,000 cfs river flow." The proposed revision requires reactor shutdown at 300 feet at the River Water Intake Structure, within 2 hours. The current flood hazard analysis (summarized in Reference 6.2) determined that a river flow of 1,000,000 cfs will result in a river stage of approximately 300 feet at the River Water Intake Structure. This level provides assurance that the TS will ensure that the reactor is shutdown if the river conditions approach the design condition of the dike.

The proposed amendment requires that the reactor is shutdown within 2 hours if the river conditions approach the design condition of the dike. The minimum level of protection provided by the dike is 304 feet at the downstream end of the dike. If a plant shutdown is initiated at 300 feet at the River Water Intake Structure, at least 4 feet of margin exists prior to exceeding the dike at its lowest point. Assuming a PMF flood, per UFSAR Figure 2.6-9 the time required to consume 4 feet of margin is at least 6 hours. Thus, the 2 hour response time provides a conservatively bounded period to ensure that the plant is shutdown before the flood level exceeds the protection of the dike.

HOT SHUTDOWN, defined by TS definition 1.2.2, requires the reactor to be at least subcritical by one percent delta k/k. Conversely, TS 3.14.2 requires the "unit be brought to the *hot standby* condition" [italics added] when the discharge reaches 1,000,000 cfs. HOT STANDBY, defined by TS definition 1.2.4, allows the reactor to remain critical. Furthermore, per Section 2.4.7 of the Referenced 6.5 SER, the purpose for TS 3.14.2 was to place the unit in "an emergency shutdown and cooldown condition." It was determined that the appropriate change would be to update the TS to require placing the unit in HOT SHUTDOWN.

Complementing the changes above, this proposed amendment revises TS 3.14.2 Title to read, "OPERATING LIMIT FOR FLOOD," This proposed title more accurately reflects that this specification provides an operating limit of 300 feet river water level, at which point the reactor must be taken to a HOT SHUTDOWN condition.

The proposed amendment revises the Applicability statement to specify that TS action is only required when the unit is in POWER OPERATIONS or HOT STANDBY. This proposed change clarifies that if the unit was in COLD SHUTDOWN, REFUELING, or HOT SHUTDOWN (which all require the reactor to be subcritical by at least one percent delta k/k) a mode change to HOT SHUTDOWN would not be required. By amending the TS requirement to state " POWER

OPERATIONS or HOT STANDBY" the TS action is only required when the unit is in a mode where the reactor is critical.

The proposed amendment revises TS 3.14.2 Objective to "define the action taken in the event river elevation challenges the flood protection dike." This proposed objective clearly states the purpose of TS 3.14.2, which is to ensure that the reactor is shutdown if the river conditions approach the design condition of the dike.

Lastly, the proposed amendment replaces TS 3.14.2 References 1 and 2 with a reference to the UFSAR Section 2.6.5, "Design of Hydraulic Facilities." UFSAR Section 2.6.5 provides a single, concise location for the background and supporting information for TS 3.14.2.

3.3 UFSAR Licensing Basis Flood Hazard Background

In 1967, when the TMI, Unit 1 Preliminary Safety Analysis Report (PSAR) was submitted, the PMF was 1,100,000 cfs.

In 1969, the Army Core of Engineers (ACOE) issued a revised PMF river flow value, 1,625,000 cfs, for the TMI, Unit 1 PMF.

The TMI, Unit 1 Final Safety Analysis Report (FSAR), dated 7/16/1973 (Reference 6.8) stated,

> "The present system of dikes will protect the site against inundation and wave action for the site design flood of 1,100,000 cfs. This system and design flood will remain unchanged."

The FSAR also stated that a licensee commitment was made to provide plant protection to the degree that will assure a safe and orderly shutdown for the level of flooding caused by the new PMF.

The 1973 AEC SER for TMI, Unit 1 operations (Reference 6.5) stated,

> "for floods greater than the levee design flood (1,100,000 cfs) operation will be terminated, and the plant will be placed in an emergency shutdown and cooldown condition...the applicant has provided a detailed emergency operating plan which describes the operational procedures to be taken in the event of such a flood emergency, and has listed the specific waterproofing actions to be taken for each safety related plant component."

This commitment was implemented by installing a flood barrier system (i.e., a system of seals and barriers) to protect safety related components and emergency procedures to install temporary barriers in the event of a PMF. In addition, TS 3.14.2 was added to require a plant shutdown before the water level exceeded the height of the dike protection.

Analysis in 1970 established the predicted water surface elevation for the PMF at 309.0 feet at the River Water Intake Structure. At that time, the minimum height of the flood barrier system was 311.0 feet. When the dike was designed margin was provided for the effects of wind driven waves. The wave height at a flow of 1,100,000 cfs was determined to be 2.25 feet. Neither the FSAR (Reference 6.8) nor the AEC SER (Reference 6.5) discussed consideration of wind

driven waves with the revised PMF. The current licensing basis as described in the UFSAR does not address wind generated wave activity associated with the PMF (Reference 6.4).

In March 2013, in response to an NRC Request for Information 10 CFR 50.54(f) letter regarding insights from the Fukushima accident (Reference 6.1), TMI, Unit 1 submitted a summary of the results of an external flood hazard reevaluation (Reference 6.2) performed in accordance with NUREG/CR-7046 (Reference 6.3). The limiting PMF discharge was determined to be due to a precipitation and snowmelt event that produces a discharge of 1,491,618 cfs, resulting in a peak water level of 311.0 feet at the River Water Intake Structure. When the effects of the maximum predicted wind driven wave height are included, the peak predicted water elevation was determined to be 313.2 feet at the entrance to the River Water Intake Structure.

In 2011, design modifications were performed on the TMI, Unit 1 flood protection barriers that increased the minimum height of the flood barrier system to 313.5 feet. Thus, the TMI, Unit 1 flood protection barriers, having a minimum height of 313.5 feet, provide a margin of at least 0.3 feet above the highest predicted water elevation during a PMF. No physical changes to the existing level of the flood barrier protection system are needed to support this amendment request.

3.4 UFSAR Licensing Basis Flood Hazard Evaluation

This LAR proposes a revision to replace the licensing basis flood hazard contained in the UFSAR, in its entirety, with the hazard determined in accordance with NUREG/CR-7046. NUREG/CR-7046 uses the HHA approach to demonstrate that SSCs important to safety of a nuclear power plant are adequately protected from the adverse effects of flooding. The HHA is a stepwise, progressively refined series of analyses that is aimed at demonstrating that the SSCs important to safety are adequately protected from the adverse effects of severe floods expected at the site.

In accordance with NUREG/CR-7046 an analysis of each flood-causing mechanism that may impact the site was performed. TMI, Unit 1 specific analysis was completed for local intense precipitation and site drainage, flooding in streams and rivers, and dam breaches and failures. The following mechanisms were evaluated and determined to not constitute a limiting hazard applicable at the site: ice induced flooding, channel migration or diversion, storm surge, seiche, and tsunami. A summary of analysis or evaluation of the flood hazard at TMI, Unit 1 for each flood causing mechanism is provided below.

> **NOTE:** The Intake Screen and Pump House (ISPH) and the River Water Intake Structure are the same structure at TMI, Unit 1. These terms are used throughout TS and UFSAR interchangeably.

Local intense precipitation (LIP) is a measure of the extreme precipitation (high intensity/short duration) at a given location. LIP is not considered in the current licensing basis flood hazard for TMI, Unit 1. A severe local rainfall event where 17.8 inches of rain occurs on the site within 1 hr was evaluated. The topographical data for the site was loaded into a hydraulic modeling tool to determine water levels, durations, and velocities on site. The analysis shows that without any active mitigation some water would enter the Fuel Handling Building, Auxiliary Building, and Diesel Generator Building, but the limited volume would not adversely affect any

safe shutdown functions. TMI, Unit 1 emergency response procedures have been modified to minimize the possibility that any water enters a safety related structure.
The PMF in rivers and streams is the governing external flood hazard event at TMI, Unit 1. The current licensing basis event is caused by the Probable Maximum Precipitation (PMP) across the Susquehanna watershed. The PMF discharge was determined to be 1,625,000 cfs in 1969. The peak water surface elevation at that flow is 313.3 feet at the ISPH as determined in 2011. The re-analysis of the PMF was completed in 2013. The United States Army Corps of Engineers (USACE) Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) software, version 3.5, was used to simulate the hydrologic processes of the Susquehanna watershed. The HEC-HMS model was calibrated to Tropical Storm Lee (2011). The combined-effect flood scenarios in NUREG\CR-7046 were each analyzed and the governing PMF peak discharge is caused by the snow season PMP falling on the 100 year snowpack. In this analysis, a conservative assumption that all upstream dams fail is made. The governing PMF peak discharge is 1,491,618 cfs. A hydraulic analysis using the governing PMF peak discharge was performed to determine the water surface elevations at TMI, Unit 1. The Susquehanna River from 5.4 miles upstream of TMI, Unit 1 to 13.7 miles downstream of TMI, Unit 1 was modeled with HEC-RAS, version 4.1 (Hydrologic Modeling System by USACE). A two dimensional hydrodynamic model, FLO 2D, was developed for the area closer to TMI, Unit 1. Both models were calibrated to Tropical Storm Agnes (1972). This analysis shows that a discharge of 1,491,618 cfs at TMI, Unit 1 produces a water surface elevation of 311.0 feet at the TMI, Unit 1 ISPH. The 2-year wind speed was applied on top of the governing PMF water surface elevations, and the peak water elevations and hydrodynamic loads at TMI, Unit 1 safety related structures were determined using the FLO 2D model. The highest water elevation at a pathway into a safety related structure is 313.2 feet at the entrance to the ISPH. The lowest margin between the hydrodynamic pressure and an acceptable pressure is at the Air Intake Pagoda. The Air Intake Pagoda structure margin is greater than 250 psf.

"Sunny Day" dam failures are those where dams fail without warning or a deterministic cause. The current dam failure licensing basis assumes a failure of an upstream dam coincident with a flood of 800,000 cfs. This results in a peak predicted water elevation of 301.6 feet elevation at the ISPH, which is within the dike's minimum design protection level of 304 feet. A re-analysis of the effects of the failure of any upstream dam was completed in 2013. A simultaneous failure of all upstream dams in the Susquehanna River watershed was assumed to occur at an initial river flow equal to 50% of the PMP. The resulting discharge at TMI, Unit 1 was 778,026 cfs. This flow is well within the dike design flow of 1,100,000 cfs.

Storm surge is the rise of offshore water elevation caused principally by the shear force of the hurricane or tropical depression winds acting on the water surface. Storm surge is not considered in the current licensing basis flood hazard for TMI, Unit 1. The head-of-tide on the Susquehanna River is approximately 3 miles downstream of the Conowingo Dam, which is located approximately 50 miles downstream of TMI, Unit 1. Since TMI, Unit 1 is located approximately 53 miles upstream from the tidally influenced reach of the Susquehanna River, storm surge is not considered an applicable flood-causing mechanism at TMI, Unit 1.

Seiche is an oscillation of the water surface in an enclosed or semi-enclosed water body initiated by an external cause. Seiche is not considered in the current Licensing Basis Flood Hazard for TMI, Unit 1. The Susquehanna River is not an enclosed or semi-enclosed water body and, therefore, seiche is not considered an applicable flood-causing mechanism at TMI, Unit 1.

Tsunami is a series of water waves generated by a rapid, large-scale disturbance of a water body due to seismic, landslide or volcanic tsunamingenic sources. Tsunami is not considered in the current Licensing Basis Flood Hazard for TMI, Unit 1. TMI, Unit 1 is approximately 59 miles upstream from the mouth of the Susquehanna River at the Chesapeake Bay. The downstream dams, elevation difference, and topography of the Susquehanna River would likely attenuate a Tsunami wave generated in the Chesapeake Bay. Therefore, Tsunami is not considered an applicable flood-causing mechanism at TMI, Unit 1.

Ice jams and ice dams can cause flooding by impounding water upstream of a site and subsequently collapsing or by impounding water downstream of a site and backing up water. Ice jams and ice dams are not considered in the current Licensing Basis Flood Hazard for TMI, Unit 1. A historic review was performed to identify the most severe historical ice jam event in the vicinity of the site. The most severe ice jam induced flooding event occurred in 1996. The peak flow at Harrisburg from that event was 567,000 cfs. Such an event is bounded by (i.e., is less severe than) the seismic dam failure flood and protection is provided by the dike at TMI, Unit 1.

Flood hazard associated with channel diversion is caused by the possible migration either toward the site or away from it. Flood hazard associated with channel diversion is not considered in the current licensing basis flood hazard for TMI, Unit 1. Historical records and available studies were reviewed to evaluate whether the adjacent Susquehanna River has exhibited the tendency to meander towards the site. Available sources including the TMI, Unit 1 UFSAR, current and historical topographic maps, and geologic information were reviewed. Based on review of available data, the Susquehanna River has not exhibited the tendency to meander towards the site. Channel diversion is not considered a flood hazard at TMI, Unit 1.

Implementation of the revised licensing basis flood hazard will incorporate the current regulatory guidance and methodology into the TMI, Unit 1 licensing basis flood hazard. The proposed licensing basis flood hazard will include all the flood-causing mechanisms from NUREG/CR-7046 applicable to TMI, Unit 1 (i.e., local intense precipitation, dam failure, and precipitation driven river flooding).

The revised licensing basis flood hazard will resolve the issue raised in URI 05000289/2011005-04 (Reference 6.4).

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements / Criteria

The 1973 Atomic Energy Commission's (AEC's) Safety Evaluation Report (SER), "Safety Evaluation by the Directorate of Licensing U.S. Atomic Energy Commission in the matter of Metropolitan Edison Company Jersey Central Power and Light Company Pennsylvania Electric Company Three Mile Island Nuclear Station Unit 1 [(TMI, Unit 1)]," dated July 11, 1973 stated,

> "for floods greater than the levee design flood (1,100,000 cfs) operation will be terminated, and the plant will be placed in an emergency shutdown and cooldown condition...the applicant has provided a detailed emergency operating plan which describes the operational procedures to be taken in the event of such a flood

emergency, and has listed the specific waterproofing actions to be taken for each safety related plant component."

Subsequently, Technical Specification 3.14.2 was added to require a plant shutdown before the water level exceeded the height of the dike protection. The proposed change to TS 3.14.2 is consistent with the above SER statement by requiring the unit be placed in HOT SHUTDOWN at a river flood stage below the height of the dike.

TMI, Unit 1 was designed and constructed to meet the intent of the AEC's General Design Criteria (GDC), as originally proposed in July 1967. Section 3.0 of the AEC's SER dated July 11, 1973, concluded that the plant design conforms to the intent of the GDC as revised in 1971. 10 CFR 50 Appendix A, Criterion 2, "Performance Standards," states that those systems and components of reactor facilities which are essential to the prevention of accidents which could affect the public health and safety or the mitigation of their consequences be designed, fabricated and erected to performance standards that will enable the facility to withstand, without loss of the capability to protect the public, the additional forces that might be imposed by natural phenomena such as earthquakes, tornadoes, flooding conditions, winds, ice, and other local site effects. The TMI, Unit 1 Updated Final Safety Analysis Report (UFSAR), Section 2.6, includes the design basis for the Probable Maximum Flood (PMF).

Consistent with the above requirements, the proposed UFSAR changes incorporate the NUREG/CR-7046 analysis as the TMI, Unit 1 licensing basis flood hazard. This revision is consistent with the current regulatory guidance and methodology.

4.2 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) requests an amendment to Renewed Facility Operating License No. DPR-50 for Three Mile Island Nuclear Station, Unit 1 (TMI, Unit 1).

EGC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No.

The proposed amendment will update the Technical Specifications (TS) to require placing the unit in HOT SHUTDOWN within 2 hours of the river reaching a river stage of 300 feet. The proposed amendment will revise the Licensing Basis Flood Hazard to be consistent with the current regulatory guidance and methodology in NUREG/CR-7046.

The proposed amendment does not involve physical changes to any plant structure, system, or component. As a result, no new failure modes of the Flood Protection System are being introduced.

The consequences of a previously analyzed accident are not affected. The proposed amendment increases the margin described in the original TS and ensures the reactor is not operating if river water level exceeds the protection from the dike. There are no changes in the types or significant increase in the amounts of any effluents released offsite. The proposed amendment maintains the existing level of protection provided by the dike and the Flood Barrier System.

Therefore, the proposed amendment does 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 amendment will update the TS to require placing the unit in HOT SHUTDOWN within 2 hours of the river reaching a river stage of 300 feet. The proposed amendment will also revise the licensing basis flood hazard to be consistent with the current regulatory guidance and methodology in NUREG/CR-7046 and the corresponding results of the TMI, Unit 1 specific analysis.

The proposed amendment does not involve physical changes to any plant structure, system, or component. The possibility of exceeding the design flood protection is not increased.

Therefore, the proposed amendment does 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.

The proposed amendment will update the TS to require placing the unit in HOT SHUTDOWN within 2 hours of the river reaching a river stage of 300 feet. The proposed amendment will also revise the licensing basis flood hazard to be consistent with the current regulatory guidance and methodology in NUREG/CR-7046 and the corresponding results of the TMI, Unit 1 specific analysis.

There is no reduction in the margin of safety. The proposed amendment increases the margin of safety by initiating action at a lower river stage than currently required and specifying a time-period to complete the action. The proposed amendment maintains the existing level for the flood barrier protection system, which results in an increased margin of protection for the probable maximum flood and river flooding due to dam failure.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above, EGC concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

4.3 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 the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c) (9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

6.1 NRC Letter "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," dated March 12, 2012.

6.2 Exelon Generation Company, LLC "Response to March 12, 2012, Request for Information Enclosure 2, Recommendation 2.1, Flooding, Required Response 2, Flooding Hazard Reevaluation Report," dated March 12, 2013.

6.3 NUREG/CR-7046, "Design-Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America," published November 2011.

6.4 NRC URI 05000289/2011005-04, "Adequacy of Flood Protection without Consideration of Wind Generated Wave Activity."

6.5 U.S. Atomic Energy Commission "Safety Evaluation by the Directorate of Licensing U.S. Atomic Energy Commission in the matter of Metropolitan Edison Company Jersey Central Power and Light Company Pennsylvania Electric Company Three Mile Island Nuclear Station Unit 1," dated July 11, 1973.

6.6 Three Mile Island, Unit 1 "Technical Specifications," dated April 19, 1974.

6.7 Letter from R. Herman (U.S. Nuclear Regulatory Commission) to H. Hukill (GPU Nuclear Corporation), "Issuance of Amendment (TAC No. 76033)," dated September 25, 1990.

6.8 TMI, Unit 1 Final Safety Analysis Report, (Amendment No. 12) and subsequent Amendments 13 through 41 inclusive, dated July 16, 1973.

ATTACHMENT 2

Proposed Technical Specification and
Technical Specification Bases (for information only) Pages (Mark-Up)

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

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Operating Limit for Flood

Amendment No. ~~59, 72, 78, 97, 98, 119, 122, 136, 149, 167, 182, 196,211, 216,234,242,245, 248, 264, 269~~ ~~278~~

OPERATING LIMIT FOR FLOOD

3.14.2 ~~FLOOD CONDITION FOR PLACING THE UNIT IN HOT STANDBY~~

Applicability

POWER OPERATION or HOT STANDBY

~~Applies to the river stage for placing the unit in hot standby~~.

Objective

challenges the flood protection dike

To define the action taken in the event river elevation ~~reaches 302 feet at the intake structure.~~

Specification

level

3.14.2.1 If the river ~~stage reaches elevation 302 feet~~ at the River Water Intake Structure~~, corresponding to 1,000,000 cfs river flow,~~ the unit will be ~~brought to the hot standby condition~~.

reaches 300 feet elevation then

placed in HOT SHUTDOWN within 2 hours.

Bases

~~The dikes provided protect the plant site during the design flood of 1,100,000 cfs. The design flood corresponds to an elevation of approximately 303 feet at the River Water Intake Structure (Reference 1). The dike elevation at the intake structure is 305 feet. The minimum freeboard is at the downstream end of the plant site where the dike elevation is 304 feet providing a freeboard of approximately one foot. Adequate freeboard is provided to protect the plant site from flooding due to wave action during the design flood (Reference 2).~~

~~Placing the unit in hot standby when the river stage reaches 302 feet elevation provides an additional margin of conservatism by assuring that adequate freeboard exists during operation of the unit.~~

This Technical Specification requires a plant shutdown if the flood level reaches the protection of the dike. The dike elevation at the River Water Intake Structure is 305 feet (Reference 1). The minimum dike elevation is at the downstream end of the plant site, at which point the dike elevation is 304 feet (Reference 1). Placing the unit in HOT SHUTDOWN when the river stage reaches 300 feet elevation at the River Water Intake Structure provides an adequate margin to ensure the reactor is shutdown before the river water level exceeds the dike.

References

(1) ~~UFSAR, Figure 2.6-15 - "Dike Freeboard - Design Flood"~~

~~(2) UFSAR, Section 2.6.4 - "Flood Studies"~~

UFSAR, Section 2.6.5 - "Design of Hydraulic Facilities"