June 29, 2017
10 CFR 50.54f
L-2017-124

U. S. Nuclear Regulatory Commission
Attn.: Document Control Desk
Washington, D.C. 20555

Re: Turkey Point Unit 3 and Unit 4
Docket Nos. 50-250 and 50-251
Flooding Focused Evaluation Summary

References:

1. NRC Request for Information Pursuant to 10 CFR 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, ADAMS Accession Number ML12056A046.
2. FPL Letter, L-2014-087, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Flood Hazard Reevaluations for Recommendation 2.1, dated March 11, 2013, ADAMS Accession Number ML13095A216.
3. NRC Letter, Turkey Point Nuclear Generating, Unit Nos. 3 and 4 - Staff Assessment of Response to Title 10 CFR 50.54(f), Information Request – Flood Causing Mechanism Reevaluation (TAC NOS MF1114 and MF1115)," dated December 4, 2014, ADAMS Accession Number ML14324A816.
4. NRC Letter, Turkey Point Nuclear Generating, Unit Nos. 3 and 4 – Supplement to Staff Assessment of Response to 10 CFR 50.54(f) Information Request-Flood-Causing Mechanisms Reevaluation (CAC Nos. MF1114 and MF1115), dated November 4, 2015, ADAMS Accession Number ML15301A200.
5. NRC Staff Requirements Memoranda to COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond Design-Basis External Events and Reevaluation of Flooding Hazards," dated March 30, 2015.
6. NRC Letter, Coordination of Requests for Information Regarding Flooding Hazard Reevaluations and Mitigating Strategies for Beyond-Design-Basis External Events, dated September 1, 2015.
7. NEI 16-05, Revision 1, External Flooding Assessment Guidelines, dated June 2016, ADAMS Accession Number ML16165A178.
8. U.S. Nuclear Regulatory Commission, JLD-ISG-2016-01, Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation; Focused Evaluation and Integrated Assessment, Revision 0, dated July 11, 2016, ADAMS Accession Number, ML16162A439.

On March 12, 2012, the NRC issued Reference 1 to request information associated with Near Term Task Force (NTTF) Recommendation 2.1 for Flooding. Enclosure 2 of Reference 1, requested that licensees reevaluate flood hazards using present day methods and regulatory guidance and to submit the Flood Hazard Reevaluation Report (FHRR). For Turkey Point Units 3 and 4, the FHRR was submitted on March 11, 2013, Reference 2, and supplemented by FPL letters dated January 31, 2014, February 26, 2014, and April 25, 2014, and August 7, 2014, ADAMS Accession Numbers ML14055A365, ML14073A065, ML14149A479 and ML14234A085, respectively. The NRC Staff completed its review as documented in the Staff Assessment, Reference 3, and in the Supplement of the Staff Assessment, Reference 4.

Following the Commission's directive to NRC Staff in Reference 5, the NRC issued a letter to industry (Reference 6) indicating that new guidance is being prepared to replace instructions in Reference 5 and provide for a "graded approach to flooding reevaluations" and "more focused evaluations of local intense precipitation and available physical margin in lieu of proceeding to an integrated assessment."

NEI prepared the new "External Flooding Assessment Guidelines" in NEI 16-05 (Reference 7), which was endorsed by the NRC in Reference 8. NEI 16-05 indicates that each flood-causing mechanism not bounded by the design basis flood (using only stillwater and/or wind-wave runup level) should follow one of the following five assessment paths:

- Path 1: Demonstrate Flood Mechanism is Bounded Through Improve Realism
- Path 2: Demonstrate Effective Flood Protection
- Path 3: Demonstrate a Feasible Response to LIP
- Path 4: Demonstrate Effective Mitigation
- Path 5: Scenario Based Approach

Non-bounded flood-causing mechanisms in Paths 1, 2, or 3 would only require a Focused Evaluation (FE) to complete the actions related to external flooding required by the March 12, 2012 10 CFR 50.54(f) letter. Mechanisms in Paths 4 or 5 require an Integrated Assessment

Turkey Point Units 3 and 4 followed Path 2, Demonstrate Effective Flood Protection, in accordance with NEI 16-05, Rev. 1, and utilized Appendices B and C to that document for guidance on evaluating the site strategy. The flooding focused evaluation for Turkey Point Units 3 and 4 is provided in the Attachment to this letter.

This submittal completes the actions related to External Flooding required by the March 12, 2012 10 CFR 50.54(f) letter.

Should you have any questions regarding this submittal, please contact Mr. Mitch Guth, Turkey Point Licensing Manager, at 305-246-6698.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 29, 2017.

Sincerely,

Thomas Summers
Regional Vice President, Southern Region
Turkey Point Nuclear Plant

Enclosure

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Senior Resident Inspector, Turkey Point Nuclear Plant

L-2017-124
ATTACHMENT

TURKEY POINT UNITS 3 & 4
FLOODING
FOCUSED EVALUATION SUMMARY

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TURKEY POINT NUCLEAR GENERATING STATION FLOODING FOCUSED EVALUATION SUMMARY

1 EXECUTIVE SUMMARY

The Turkey Point Nuclear Generating Station (PTN) has reevaluated its flooding hazard in accordance with the NRC's March 12, 2012, 10 CFR 50.54(f) request for information (RFI) (Reference 1). The RFI was issued as part of implementing lessons learned from the Fukushima Dai-ichi accident; specifically, to address Recommendation 2.1 of the NRC's Near-Term Task Force report. This information was submitted to the NRC in a flood hazard reevaluation report (FHRR) on March 11, 2013 (Reference 2), with errata corrections submitted on April 8, 2013 (Reference 3) and supplemental information submitted on August 7, 2014 (Reference 21). This is assessed in the Mitigating Strategies Flood Hazard Information (MSFHI) documented in the NRC's "Staff Assessment" letter dated December 4, 2014 (Reference 9) and "Supplement to Staff Assessment" letter dated November 4, 2015 (Reference 10). The only change to the flooding analyses performed since the issuance of the MSFHI letters is a revision to the Local Intense Precipitation (LIP) calculation (Reference 18), which now takes credit for the dewatering pumps in the CCW pump rooms during a Scenario B LIP. This scenario occurs while site is under Hurricane Readiness Procedure 0-ADM-116 (Reference 17). There are four (4) mechanisms that were found to exceed the Current Design Basis (CDB) flood level at PTN. These mechanisms are listed below and included in this Focused Evaluation (FE):

1. Local Intense Precipitation
2. Storm Surge
3. Seiche
4. Tsunami

The applicable Combined Events hazards are analyzed by the Storm Surge and Tsunami mechanisms and thus is not considered separately (Reference 2, Section 4.14). Associated effects (AE) and flood event duration (FED) parameters for all flooding mechanisms other than Seiche were assessed and submitted as a part of the MSA (Reference 20). These parameters were not required for the Seiche because PTN was determined not to be affected by this mechanism and is eliminated from further evaluation (Reference 2, Section 5.5). This FE concludes that, once several planned changes are implemented, the strategy for maintaining key safety functions (KSFs) during all four (4) mechanisms has effective flood protection through the demonstration of adequate Available Physical Margin (APM), reliability of flood protection features, and that the overall site response is adequate. This FE followed Path 2 of NEI 16-05, Rev. 1 and utilized Appendices B and C to that document for guidance on evaluating the site strategy. This submittal completes the actions related to External Flooding required by the March 12, 2012 10 CFR 50.54(f) letter.

2 BACKGROUND

On March 12, 2012, the NRC issued Reference 1 to request information associated with Near-Term Task Force (NTTF) Recommendation 2.1 for flooding. The RFI (Reference 1) directed licensees, in part, to submit a FHRR to reevaluate the flood hazards for their sites using present-day methods and guidance used for early site permits and combined operating licenses. For PTN, the FHRR was submitted on March 11, 2013 (Reference 2).

Following the Commission's directive to NRC Staff in Reference 4, the NRC issued a letter to the industry (Reference 7) indicating that new guidance is being prepared to replace instructions in Reference 11 and provide for a "graded approach to flooding reevaluations" and "more focused evaluations of local intense precipitation and available physical margin in lieu of proceeding to an integrated assessment." NEI prepared the new "External Flooding Assessment Guidelines" in NEI 16-05 (Reference 5), which was endorsed by the NRC in Reference 6. NEI 16-05 indicates that each flood-causing mechanism not bounded by the design basis flood (using only stillwater and/or wind-wave run-up level) should follow one of the following five assessment paths:

- Path 1: Demonstrate Flood Mechanism is Bounded Through Improved Realism
- Path 2: Demonstrate Effective Flood Protection
- Path 3: Demonstrate a Feasible Response to LIP
- Path 4: Demonstrate Effective Mitigation
- Path 5: Scenario Based Approach

Non-bounded flood-causing mechanisms in Paths 1, 2, or 3 would only require a FE to complete the actions related to external flooding required by the March 12, 2012 10 CFR 50.54(f) letter. Mechanisms in Paths 4 or 5 require an Integrated Assessment.

3 TERMS AND DEFINITIONS

- AE – Associated Effects
- AIMs – Assumptions, Inputs, and Methods
- APM – Available Physical Margin
- CCW – Component Cooling Water
- CCW3 – Component Cooling Water Pump Room Unit 3
- CCW4 – Component Cooling Water Pump Room Unit 4
- CDB – Current Design Basis
- CMU – Concrete Masonry Unit
- CRF – Central Receiving Facility
- EDG – Emergency Diesel Generators
- FE – Focused Evaluation
- FED – Flood Event Duration
- FIAP – Flooding Impact Assessment Process
- FHRR – Flood Hazard Reevaluation Report
- FLEX – Diverse and Flexible Coping Strategies covered by NRC order EA-12-049
- FT – Feet
- GPM – Gallons Per Minute
- Key SSC – A System Structure or Component relied upon to fulfill a Key Safety Function
- KSF – Key Safety Function, i.e. core cooling, spent fuel pool cooling, or containment function.
- LIP – Local Intense Precipitation
- MCC – Motor Control Center
- MLW – Mean Low Water (Site Datum) – 2.307 ft below NAVD88 (FHRR, Reference 2)
- MPH – Miles Per Hour
- MSA – Mitigating Strategies Assessment as described in NEI 12-06 Rev 2, App G
- MSFHI – Mitigating Strategies Flood Hazard Information
- NAVD88 – North American Vertical Datum 1988
- NTTF – Near Term Task Force commissioned by the NRC to recommend actions following the Fukushima Dai-ichi accidents
- PMH – Probable Maximum Hurricane
- PMSS – Probable Maximum Storm Surge
- PMT – Probably Maximum Tsunami
- POI – Point of Interest (in the FLO-2D model)
- PTN - Turkey Point Nuclear Generating Station
- RFI – Request for Information
- RWST – Refueling Water Storage Tank
- TSA – Time Sensitive Action

4 FLOOD HAZARD PARAMETERS FOR UNBOUNDED MECHANISMS

The NRC has completed the "Staff Assessment" (Reference 9) and "Supplement to Staff Assessment" (Reference 10) which contains the MSFHI related to PTN's FHRR (Reference 2). In Reference 10, the NRC states that the "staff has concluded that the licensee's reevaluated flood hazard information is suitable for the assessment of mitigating strategies developed in response to Order EA-12-049 (i.e., defines the mitigating strategies flood hazard information described in guidance documents currently being finalized by the industry and NRC staff) for Turkey Point. Further, the licensee's reevaluated flood hazard information is suitable for other assessments associated with Near-Term Task Force Recommendation 2.1 'Flooding.'" The enclosure to Reference 10 includes a summary of the CDB and reevaluated flood hazard parameters. In Table 3.1.2-1 of the enclosure to Reference 10, the NRC lists the following flood-causing mechanisms for the CDB flood:

- Local Intense Precipitation;
- Streams and Rivers;
- Failure of Dams and Onsite Water Control/Storage Structures;
- Storm Surge;
- Seiche;
- Tsunami;
- Ice Induced Flooding; and
- Channel Migrations/Diversions.

In Tables 4.0-1 and 4.0-2 of the enclosure to Reference 10, the NRC lists flood hazard information (specifically flood event durations, associated effects, and reevaluated flood hazard elevations) for the following flood-causing mechanisms that are not bounded by the CDB hazard flood level at PTN:

- Local Intense Precipitation;
- Storm Surge;
- Seiche; and
- Tsunami.

These are the reevaluated flood-causing mechanisms that are addressed in this FE. The four (4) non-bounding flood mechanisms for PTN are described in detail in Reference 2, the FHRR submittal. Table 1 summarizes how these unbounded mechanisms are addressed in this FE:

Table 1 – Unbounded Flood Mechanisms

	Flood Mechanism	*Summary of Assessment*
1	Local Intense Precipitation (LIP)	Path 2 was determined to be pursued for all four (4) mechanisms at PTN since all flooding vulnerabilities are addressed by flood protection features (see FIAP Path Determination Table, Section 6.3.3 of NEI 16-05). Adequate APM, reliability of flood protection features, and adequate site response are all demonstrated with the planned changes.
2	Storm Surge (PMSS)	
3	Seiche	
4	Tsunami (PMT)	

5 OVERALL SITE FLOODING RESPONSE

5.1 DESCRIPTION OF OVERALL SITE FLOODING RESPONSE

The following are responses to each of the flooding mechanisms identified in Section 4. Though not credited in this evaluation, additional defense in depth is provided by FLEX (as confirmed in the MSA, Reference 20).

The site response for LIP is as follows:

There are two LIP scenarios evaluated. LIP Scenario A occurs during normal plant operations. LIP Scenario B occurs under Hurricane Readiness Procedure 0-ADM-116 (Reference 17). For LIP Scenario A, this FE demonstrates that no Key SSCs are impacted during a LIP event and only permanently installed protection features already credited as part of the CDB are required. Doors, buildings, and propagation pathways were evaluated to ensure they provide adequate protection during the LIP event. Sumps and sump pumps are located in each of the 4160V switchgear rooms. The sumps are equipped with a high-water level alarm that also automatically starts the associated pump to remove water flooding these rooms (Reference 30, Section 5F.1.3.3). Electrical power to these sump pumps is backed by the EDGs as shown in site drawings, References 33 through 39. The only changes being made are to seal specific manholes and conduit penetrations, as identified in Section 5.2.

As defense in depth, additional actions directed by Severe Weather Preparations procedure, 0-ONOP-103.3 (Reference 16) for Flooding/Heavy Rain, may be taken. These actions include installing dewatering pumps and drain plugs.

Table 4.0-1 of the Supplement to Staff Assessment (Reference 10) states the Time Available for Preparation for Flood Event, Duration of Inundation of Site and Time for Water to Recede from Site will be addressed in the FE for LIP Scenario A. The Duration of Inundation of Site for this scenario is taken to be 0.5 hours and the Time for Water to Recede from Site is taken to be 0.75 hours; for a total of 1.25 hours (or 1 hour and 15 minutes). This is consistent with the timeline developed in NEE016-PR-001 (Reference 15) and is identical to LIP Scenario B. Since there are no Key SSCs adversely impacted and the time for the water to recede is relatively short, no additional actions are needed for LIP Scenario A.

For LIP Scenario B, there are no appreciable differences in water level between the two LIP scenarios at any location other than at the CCW pump rooms. The calculated maximum flood height without crediting any additional protection features in this area is 20.8 feet (ft) North American Vertical Datum 1988 (NAVD88), which is above 18.12 ft NAVD88, the height of the Key SSCs (CCW pumps) in these rooms. As a compensatory measure, PTN credits use of the CCW pump room dewatering pumps, which will already have been deployed as part of the Hurricane Preparedness Procedure. This reduces the maximum water level to 16.6 ft NAVD88, which is below the height of the Key SSCs.

Turning these dewatering pumps on and periodically monitoring them is the only manual action required as part of the Scenario B response. Although the CCW pump rooms have no roof and are exposed to rainfall, the surrounding walls shield the area from high winds.

The site response for Storm Surge is as follows:

This FE demonstrates that with the addition of the changes identified in Section 5.2, no Key SSCs are impacted by flood waters during the PMSS event. Flood barrier walls, concrete jersey barriers, stoplogs, doors, drain plugs, manhole covers, conduit penetrations, and sandbags around specific floor drains are all flood protection features analyzed for the PMSS event. Additionally, the RWST and Intake Structure were evaluated.

Manual actions required prior to the arrival of a hurricane are included in the Hurricane Season Readiness procedure, 0-ADM-116 (Reference 17). This procedure outlines the actions to be taken prior to the start of hurricane season (June through November) and 72 hours prior to the projected arrival of tropical storm force winds (39 mph). All actions taken for PMSS flood protection and mitigation are performed well in advance of hurricane arrival as part of the Hurricane Season Readiness Procedure.

As defense in depth, sandbags are also deployed to provide additional protection for doorways, stoplogs, and manhole covers. The location, quantity, and configuration are specified in the Hurricane Season Readiness procedure (Reference 17). Similarly, portable sump pumps can optionally be used by the same procedure.

The site response for Seiche is as follows:

It was determined in the FHRR (Reference 2, Section 4.5) and confirmed in the Supplement to Staff Assessment (Reference 10) that the Seiche is not applicable and thus is only listed here for completeness because it is not addressed in the CDB. Maximum water heights were not calculated for this scenario and Key SSCs are not impacted from this flooding event.

The site response for Tsunami is as follows:

This FE demonstrates that no doors, buildings, or propagation pathways that contain Key SSCs are challenged by flood waters during the PMT event. The calculated maximum water height is below grade elevation. Therefore, Key SSCs are not impacted by this flooding event.

5.2 SUMMARY OF PLANT MODIFICATIONS AND CHANGES

There are several planned changes that will be implemented to ensure adequate APM and reliability of flood protection features credited for the reevaluated levels during a PMSS. These planned changes are presented in Table 2. Changes to the manholes and conduit penetrations also support the LIP.

Table 2 – Planned Changes

Protection Feature to be Changed	*Planned Changes (based on Reference 27)*
Jersey Barriers	Install a removable 4 ft concrete block barrier at Stoplogs 1, 2, 16, 17, 18, 19, 20, 21, 22, 23, 24, SL-1, SL-2, and SL-4. Tracked via condition report AR 01977483-03.
Flood Barrier Wall	Replace the existing CMU wall with a stronger/taller CMU wall. Tracked via AR 01977483-03.
Stoplogs	Add additional weld metal to Stoplogs 16-22. Tracked via condition report AR 01977483-03.
Stoplogs	Add reinforcing stiffeners to Stoplogs 16-24. Tracked via condition report AR 01977483-03.
Stoplogs	Replace existing anchors on Stoplogs 23 and 24 with higher capacity mechanical/epoxy anchors. Tracked via condition report AR 01977483-03.
Stoplogs	Reinforce the CMU flood wall with rebar around Stoplogs 1 and 15. Tracked via condition report AR 01977483-03.
Stoplogs	Caulk/seal the identified stoplogs before a flooding event. Tracked via condition report AR 01977483-03.
Drain Plug	Procure a new 12 in. drain plug rated for at least 10 ft of back pressure. Tracked via condition report AR 01977483-03.
Manholes	Install watertight sealing solution on the 23 manholes identified in NEE016-PR-001 (Reference 15, Attachment B). Tracked via condition report AR 01977483-03.
Conduit Penetrations	Install watertight seals on the 209 conduits identified in the Flooding Hazards Modifications Alternative Analysis (Reference 27, Attachment 11). Tracked via condition report AR 01977483-03.

6 FLOOD IMPACT ASSESSMENT

6.1 LOCAL INTENSE PRECIPITATION SCENARIO A– PATH 2

6.1.1 DESCRIPTION OF FLOOD IMPACT

As discussed in Section 5.1, LIP Scenario A occurs during normal operations while Scenario B occurs under Hurricane Season Readiness procedure 0-ADM-116 (Reference 17). For the LIP events, manhole cover seals, conduits, roof structures, and LIP internal flood pathways were evaluated in NEE016-PR-001 (Reference 15). Also credited are the sump pumps located in each of the switchgear rooms that automatically begin to pump out any water flooding into the rooms once a high level alarm/switch is triggered (Reference 30, Section 5F.1.3.3). This is the only active feature credited for Scenario A. APM was calculated for each Fire Zone, with the Key SSCs within these Fire Zones identified. It was determined that no Key SSCs are impacted using the current flood protection features. The limiting APM for these switchgear rooms is 0.09 ft. The minimum APM in any area is 0.01 ft, which occurs at the 3C, 4C, and 3D MCCs. The information provided in Table 3 is taken from NEE016-PR-001 (Reference 15) and presents the relevant APM.

Table 3 – LIP Scenario A Flood Elevations

Area (and Key SSC)	*Key SSC Elevation*	*Re-evaluated Flood Hazard*	*APM*
Fire Zone 67 (4B 4160V)	15.87* ft NAVD88	15.78 ft NAVD88	0.09*
Fire Zone 58 (3C, 4C, & 3D MCCs)	16.12 ft NAVD88	16.11 ft NAVD88	0.01
Fire Zone 47 (CCW4 Pumps) Fire Zone 54 (CCW3 Pumps)	18.12 ft NAVD88 18.12 ft NAVD88	17.2** ft NAVD88	0.92**

*Based on plant floor grade of 15.7 ft NAVD88 and an equipment height of 2 inches above the ground (Reference 40), rounded to the nearest hundredth of a foot.
**CCW3 values reported since they are bounding over CCW4.

As additional defense in depth, Severe Weather Preparations procedure 0-ONOP-103.3 (Reference 16) includes compensatory actions that were intended for larger hurricanes but is now also implemented in the event of flooding/heavy rainfall. Initiated by any rainfall event in excess of 0.5 inches in a 24-hour period, actions such as installing drain plugs or dewatering pumps in the Unit 3 & 4 Condenser Pit Sump may be initiated.

6.1.2 ADEQUATE APM JUSTIFICATION AND RELIABILITY OF FLOOD PROTECTION

During a LIP event, exterior doors are exposed to flood water up to a height equal to the maximum flood elevation. Because the exterior doors are currently unsealed, substantial leakage is expected. The maximum flood elevation for each fire zone is determined by locating the Points of Interest (POIs) closest to the exterior doors of the

fire zone. If the SSCs' elevation is greater than the maximum flood elevation, the water level in the fire zone will not be able to reach the SSC. The APM for fire zones not protected by sealed doors are determined based on the difference between the Key SSC elevation and the maximum flood elevation. As indicated in Section 6.1.1, APM in several fire zones is calculated, the minimum being 0.01 ft in Fire Zone 58. Per NEI 16-05 Appendix B Section B.1, "Negligible or zero APM can be justified as acceptable if the use of conservative inputs, assumptions, and/or methods in the flood hazard reevaluation can be established." Since the AIMs used in this LIP analysis are conservative, this APM is considered adequate. The following are examples of conservatisms used in the revised LIP flood analysis:

1. HMR-51/52 (References 12 & 13), which determine the greatest rainfall rates theoretically possible for the United States east of the 105th meridian, were conservatively used for the precipitation input in Reference 23. A site-specific study would have likely reduced the ponding elevations.

2. The velocity outside the buildings were conservatively considered to be perpendicular to the doors when added to the corresponding water depth for the total hydraulic head (Reference 22).

3. All site surfaces are considered impervious surfaces and no infiltration is credited (References 18 & 22).

4. The floor drainage system is modeled as blocked (Reference 15, Section 5.1.1). Similarly, no credit was given to yard drains (Reference 31).

For reliability, there are no temporary flood protection features or manual actions credited for the Scenario A LIP event. The only active protection features credited are the sump pumps located in each of the switchgear rooms, which are already credited as part of the CDB (Reference 30, Section 5F.1.3.3). Building doors are expected to maintain structural integrity since the water height is only 1.6 ft (Reference 15, Section 7.1.2.1, calculated as the maximum flood height within the protected area of 17.3 ft NAVD88 minus plant grade of 15.7 ft NAVD88). Water ingress through the stair roof hatch in the middle of the Auxiliary Building is not considered a credible flood mechanism because the stair opening is covered with a roof hatch (Reference 15, Attachment D). Water ingress through the conduits and manholes discussed in Section 5.2 will be sealed to ensure reliability and adequate APM against the reevaluated flood levels. Conservative leakage rates through the doorways based on these increased hydrostatic forces is also accounted for. As stated in Supplement to Staff Assessment (Reference 10), there is no wave run-up during a LIP event and therefore hydrodynamic and debris impact forces are not applicable. This is documented in NEE016-PR-001 (Reference 15), which states the hydrodynamic loads due to the LIP flooding are negligible because water velocities are very low and the debris loads are

also negligible. This meets the criteria for reliability of flood protection features set by Appendix B of NEI 16-05 (Reference 5).

6.1.3 Adequate Overall Site Response

There are no required manual actions for this response to be successful and, therefore, an evaluation of the overall site response is not necessary. However, as discussed in Section 6.1.1, Severe Weather Preparations procedure 0-ONOP-103.3 (Reference 16) includes additional compensatory actions intended for hurricane preparation that is now implemented as an enhancement to the strategy given an extreme weather event such as a flash flood warning, tropical storm, or hurricane at the discretion of the Shift Manager/ Emergency Coordinator.

6.2 Local Intense Precipitation Scenario B– Path 2

6.2.1 Description of Flood Impact

As discussed in Section 5.1, LIP Scenario B occurs while the site is already under Hurricane Season Readiness procedure 0-ADM-116 (Reference 17). Report NEE016-PR-001 (Reference 15) compares the flood levels for the different LIP scenarios. The only appreciable flooding elevation difference between the two occurs in the CCW pump rooms. Without any modifications to the flood protection strategy, these areas were expected to reach 20.8 ft NAVD88 (Reference 18), consistent with the Supplement to the Staff Assessment (Reference 10). This would have exceeded the 18.12 ft NAVD88 elevation of the CCW pumps, which are the Key SSCs in these pump rooms. As a compensatory measure, dewatering pumps are now credited to evacuate rainwater from the CCW3 and CCW4 areas. These dewatering pumps have already been integrated into Hurricane Season Readiness procedure 0-ADM-116 (Reference 17). This drops the calculated CCW water level to 16.6 ft NAVD88 (Reference 15), which is lower than the 17.2 ft NAVD88 for Scenario A as shown in Table 3. Actuation of these pumps is the only required manual action. PTN has also performed several modifications to the Auxiliary Building roof to reduce ponding levels as a result of these analyses (Reference 32).

6.2.2 Adequate APM Justification and Reliability of Flood Protection

As discussed in Section 6.2.1, there are no appreciable differences between the LIP scenario flood elevations except for in the CCW pump rooms. Since the resulting CCW pump room water levels are lower for Scenario B, they are bounded by Scenario A and the same justification for adequate APM and reliability of the flood protection features is applicable. Therefore, the only piece that needs to be addressed is the reliability of the dewatering pumps being used in the CCW pump rooms.

Two Thompson 3T Series pumps are designated for the CCW3 Room and a combination of a Thompson 3S Series pump and a Thompson 3T Series pump are used for the CCW4 Room (Reference 19). Each of the pumps have 3-inch (nominal) diameter hoses

and fittings for the suction and discharge. These pumps were selected because they have wheels and each have a nominal pump capacity of 300 gpm (600 gpm total for each pump room), which combined exceed the 500 gpm requirement in 0-ADM-116 (Reference 17). These pumps are normally stored inside the CRF (Reference 17). PM 44109-01, which inspects pumps prior to hurricane season, was updated to include these dewatering pumps. Given the pumping capacity exceeds the credited rate, the pumps are stored in indoor conditions, and PM tasks are in place to ensure proper operation, these pumps are determined to meet the reliability criteria from Appendix B of NEI 16-05.

6.2.3 ADEQUATE OVERALL SITE RESPONSE

This evaluation, performed in accordance with NEI 16-05 Appendix C, has demonstrated the overall site response to a LIP event during Scenario B is adequate. As discussed in Section 6.2.1, portable dewatering pumps will be used to remove flooding in the CCW pump rooms. Since this scenario only occurs when an expected hurricane spawns a LIP event, these pumps will have already been deployed. Discussion of dewatering pump deployment is covered under the Storm Surge event in Section 6.3.3 and will already be staged once a Scenario B LIP occurs. Thus, the only action required for a LIP is to turn the dewatering pumps on and periodically monitor them if the rooms become flooded. The following sections outline the results of evaluating the criteria in NEI 16-05 Appendix C.

6.2.3.1 DEFINING CRITICAL PATH AND IDENTIFYING TIME SENSITIVE ACTIONS (TSAS)

There are no TSAs required for this site response. As discussed in Section 6.2.3, the portable dewatering pumps will have already been deployed and therefore the only manual action is to turn the pumps on. Per 0-ADM-116 (Reference 17), there are two dewatering pumps in each CCW pump room (four total). In the event of heavy rain, which is triggered under Severe Weather Preparations procedure 0-ONOP-103.3 (Reference 16) for any flash flood or rain in excess of 0.5 inches in a 24 hour period, these dewatering pumps "should be started when sufficient water has accumulated over the dewatering pump suction line strainer to permit pump(s) to run without being starved for flow". It goes on to say that depending on the conditions, use of only a single dewatering pump may be adequate.

6.2.3.2 DEMONSTRATION ALL TSAS ARE FEASIBLE

There are no TSAs required for this site response. The only required action is for an operator to turn on the pumps (which are already deployed) and monitor them periodically. PTN-ENG-SECS-13-012 (Reference 19) developed additional procedural enhancements integrated into 0-ADM-116 (Reference 17) to ensure the pumps would be operated safely. With these changes, PTN-ENG-SECS-13-012 concluded that the procedure provides sufficient description to implement the procedure as written.

6.2.3.3 ESTABLISHING UNAMBIGUOUS PROCEDURAL TRIGGERS

Hurricane Season Readiness procedure 0-ADM-116 (Reference 17) is initiated 72 hours prior to arrival of a projected severe weather event or as directed by the Emergency Preparedness Manager. Severe Weather Preparations procedure 0-ONOP-103.3 (Reference 16) is entered in the event of a flash flood warning or rainfall more than 0.5 inches in a 24-hour period. There is not a specific water level when the CCW dewatering pumps are required to be used; only when "sufficient water has accumulated over the dewatering pump suction line strainer to permit pump(s) to run without being starved for flow". Depending on the weather conditions and the quantity of incoming water, running a single dewatering pump in a CCW room may be sufficient. As conditions warrant, it could become necessary to run both pumps concurrently.

6.2.3.4 PROCEDURALIZED AND CLEAR ORGANIZATIONAL RESPONSE TO A FLOOD

0-ADM-116 (Reference 17) and 0-ONOP-103.3 (Reference 16) provide clear guidance on actions that are required to be taken once a hurricane or severe weather is expected. The Shift Manager is ultimately responsible for all actions taken. There are no TSAs required. The only manual action is to turn on and periodically monitor the CCW dewatering pumps, as deemed necessary depending on the level of flooding in these CCW pump rooms. In this scenario, the site will already be under Hurricane Season Readiness procedure 0-ADM-116 with appropriate staffing levels and site preparedness as discussed in Section 6.3.

6.2.3.5 DETAILED FLOOD RESPONSE TIMELINE

Given the limited number of actions required during a Scenario B LIP event, a detailed flood response timeline is not required.

6.2.3.6 ACCOUNTING FOR THE EXPECTED ENVIRONMENTAL CONDITIONS

These CCW pump rooms do not have a roof and are exposed to the rainfall associated with a LIP event. However, the dewatering pumps will have already been deployed as part of hurricane preparations, so the only manual action required is to turn on the dewatering pumps for the CCW pump rooms and periodically monitor them. Engineering performed inspections, walkdowns, and interviews to validate the acceptability and suitability of the dewatering pumps for the CCW pump rooms. Also, interviews were performed to validate the timeline and required actions for placement and operations of the dewatering pumps (Reference 19). Given the short amount of time expected to complete these actions, it is highly unlikely that conditions will deteriorate enough to impede operation of the pumps. Also, per PTN-ENG-SECS-13-012 (Reference 19) the pumps can run for over 2 hours on a full tank of fuel. Given the LIP event and recession occur over 1 hour and 15 minutes as discussed in Section 5.1, the environmental conditions during refueling will not be challenged. The dewatering pumps in the CCW pump rooms are considered reasonably shielded from high winds since these rooms are enclosed by reinforced concrete walls that are approximately

17.5 ft high. The roof is open, but protected with grating. Therefore, the expected environmental conditions will not impact these actions.

6.2.3.7 Demonstration of Adequate Site Response

The site response to a Scenario B LIP has been demonstrated as adequate by meeting the guidelines in NEI 16-05 Appendix C. The required dewatering pumps for the CCW pump rooms will have already been deployed as part of the Hurricane Season Readiness procedure 0-ADM-116 (Reference 17) and the only required manual action is to turn on and periodically monitor the dewatering pumps if flooding starts to occur in the CCW pump rooms.

6.3 Storm Surge – Path 2

6.3.1 Description of Flood Impact

The PMSS at PTN is caused by a PMH and as such, the site will be under the Hurricane Preparedness procedure 0-ADM-116 (Reference 17). As discussed in Section 5.1, the site relies upon protection from flood barrier walls, concrete jersey barriers, stoplogs, drain plugs, manhole covers, conduit penetration seals, and sandbags as flood protection features. Table 4 presents the site flood barrier wall protection heights, current re-evaluated flood levels, and APM. Note, this supersedes the margin values presented in letter L-2014-257 (Reference 21). As shown, the minimum flood wall APM is 0.1 ft. Note, this does not include the 20-year sea level increase, which was calculated to be 0.39 feet (Reference 2, Section 6.4).

Table 4 – Current Flood Wall APM

Area	*Re-evaluated Flood Hazard (without sea level rise)*	*Flood Protection Elevation*	*APM*
East	18.2 ft NAVD88	19.7 ft NAVD88	1.5 ft
North	17.6 ft NAVD88	17.7 ft NAVD88	0.1 ft
South	17.5 ft NAVD88	17.7 ft NAVD88	0.2 ft
West	17.1 ft NAVD88	17.7 ft NAVD88	0.6 ft

Internal flooding pathways into buildings that contain Key SSCs via features such as conduits, penetrations, manholes, etc. were evaluated in Attachment J of Reference 15 and assigned bounding leakage rates. It was determined that the APM determined in Attachment C of the same Reference for LIP bounded the PMSS, except for Fire Zones 11 – 16, 47, and 54. Zone 54 was calculated to have the limiting APM as presented in Table 5. This does not credit the CCW pump room portable dewatering pumps or additional sandbagging of stoplogs, manholes, etc., which are integrated into Hurricane Season Readiness procedure 0-ADM-116 (Reference 17).

Table 5 – Limiting PMSS Internal Flood Area Not Bounded by LIP

Area (and Key SSC)	*Key SSC Elevation*	*Re-evaluated Flood Hazard*	*APM*
Fire Zone 54 (CCW Pumps)	18.12 ft NAVD88	17.36 ft NAVD88	0.76 ft

Per 0-ADM-116 (Reference 17), drains can alternatively be protected with a sandbag ring when a drain plug cannot be used (such as if a non-removable equipment drain pipe interferes). This procedure specifies a minimum sandbag elevation of 20 ft MWL (17.7 ft NAVD88). As defense in depth, 0-ADM-116 includes the option of using portable sump pumps inside these sandbag rings. The APM for this protection feature is presented in Table 6.

Table 6 – PMSS Drain Protection APM

Sandbag Drain Protection Elevation	*Re-evaluated Flood Hazard (stillwater)*	*APM*
17.7 ft NAVD88	17.3 ft NAVD88	0.4 ft

6.3.2 ADEQUATE APM JUSTIFICATION AND RELIABILITY OF FLOOD PROTECTION

As discussed in Section 6.3.1, several APMs were calculated. The minimum Flood Barrier APM was calculated to be 0.1 ft for the north side. The limiting APM of any area not bounded by the LIP was calculated to be 0.76 ft in Fire Zone 54, which houses the CCW pumps. The minimum APM for all other Fire Zones where LIP is bounding is thus 0.01 ft, as shown in Table 3. While there is considerably small margin, per NEI 16-05 Appendix B Section B.1, "Negligible or zero APM can be justified as acceptable if the use of conservative inputs, assumptions, and/or methods in the flood hazard reevaluation can be established." Since the AIMs used in this PMSS analysis are conservative, this APM is considered adequate. The following are examples of conservatisms used in the revised PMSS flood analyses:

1. The 20 nautical miles' radius of maximum winds (RMW) is very conservative for a storm of extremely low central pressure (884 millibars), as used in the models, and bounds observed historical parameter combinations with substantial margin (Reference 24).

2. The radius of maximum winds was kept constant for all model simulations in space and time, even if the storm track moved over oceanic island or landmasses; this is conservative, indicating that the storm does not weaken (Reference 24).

3. Rayleigh distribution is conservatively assumed for waves in wave runup formulas. Most waves at the power block would already be broken and, therefore, do not follow the Rayleigh distribution (Reference 25).

4. Due to the nature of the PMSS event and the unexpected storm-related effects, a safety factor (SF) of 3 was applied to the hydrodynamic pressures calculated. The USACE Coastal Engineering Manual states that if the design wave is expected to occur frequently, such as in depth-limited situations, a SF of at least 2 should be applied to the calculated forces and moments (Reference 26).

A combination of temporary and permanent flood protection features are credited for the PMSS at PTN. The temporary protection features credited are Jersey Barriers, stoplogs, drain plugs, and sandbags around drains where drain plugs cannot be used. The permanent protection features credited are the manholes, conduit and pipe penetration seals, existing structures, and site grade. These were all previously credited as part of the original design barrier. Per NEI 16-05 Section B.2, an evaluation is not required to reconstitute all aspects of the original barrier design. However, for existing flood barriers being credited for higher flood levels, the barrier's ability to provide flood protection needs to be verified for the re-evaluated flood parameters that exceed the current design. NEE016-PR-001 (Reference 15) evaluated the adequacy of all flood protection features credited for the PMSS, with the exception of sandbags that are used to protect drains that cannot be plugged. The adequacy of each protection feature is dispositioned in Table 7. Also included is whether a change is planned, which aligns with those listed in Table 2.

Table 7 – PMSS Protection Feature Reliability

Protection Feature	Conclusion	Change(s) Included in Table 2?
RWST	The RWST and associated piping is qualified for the applicable reevaluated hydrostatic, hydrodynamic, sedimentation and debris loads (Reference 15, Section 7.2.1).	No
Jersey Barriers	The jersey barriers and block barriers are structurally adequate to withstand the reevaluated loads from any direction. However, they are susceptible to sliding and overturning due to impact by the debris loads (Reference 15, Section 7.2.2).	Yes

Protection Feature	Conclusion	Change(s) Included in Table 2?
Flood Barrier Wall	All but three (3) sections of the flood wall portions remain qualified, as their existing design provides sufficient margin for the reevaluated flood loads and there are no pathways for water intrusion (Reference 15, Section 7.2.3). PM 37141 currently inspects the concrete barriers yearly to ensure they are intact.	Yes
Stoplogs	Specific stoplogs will be modified to ensure reliability and adequate APM against the reevaluated flood loads. PM 37141 currently inspects the stoplogs yearly for deterioration.	Yes
Drain Plugs	All drain plugs except for the 12 inch drain plug installed in Manhole 3B will perform their intended function as a credited flood protection feature under the reevaluated flood levels (Reference 15, Section 7.2.6). A new drain plug will be procured for Manhole 3B. PM 83395 currently inspects the drain plugs yearly for seal loss, missing hardware, cracking, etc.	Yes
Internal Flood Pathways (Manholes, Conduits, Pipe Penetrations, doors, etc.)	Specific unsealed manholes and conduits that were identified will be sealed to ensure reliability and adequate APM against the reevaluated flood loads (Reference 15, Sections 7.2.7 and 7.2.8). PM 37176 also inspects the manholes yearly for seal degradation and to re-seal if needed.	Yes

Protection Feature	Conclusion	Change(s) Included in Table 2?
Intake Structure	The plastic capacity of the existing Intake Structure flood wall has been evaluated by examining the maximum ductility ratios, which are less than the allowable values specified in ACI 349. Therefore, it is concluded that the existing Intake Structure flood wall will maintain its functionality as a flood protection barrier for the PMSS event without any modifications (Reference 15, Section 7.2.9).	No
Sandbags	NEI 16-05 requires standards, codes, guidance documents and operating experience be evaluated to determine whether the configuration of the temporary barrier around drains that cannot be plugged conforms to accepted engineering practices. AR 01977483-05 was created to evaluate the sandbag ring configuration described in 0-ADM-116 and make any changes in order to meet the NEI 16-05 guidance. This is the only instance where sandbags are credited as the primary protection feature.	No

6.3.3 ADEQUATE OVERALL SITE RESPONSE

This evaluation, performed in accordance with NEI 16-05 Appendix C, has demonstrated the overall site response to a PMSS event is adequate. As discussed in Section 5.1, the site credits several types of temporary protection features, including jersey barriers, drain plugs, stoplogs, and sandbags (only for drains that cannot be plugged). The following sections outline the results of evaluating the criteria against NEI 16-05 Appendix C.

6.3.3.1 DEFINING CRITICAL PATH AND IDENTIFYING TIME SENSITIVE ACTIONS (TSAS)

The PMSS, which is based on a PMH, is identified 72 hours prior to arrival per procedure 0-ADM-116 (Reference 17). As stated in the MSA (Reference 20), this allows ample warning time for event preparation. Per NEI 12-06 (Reference 8) Section E.5.1.2, required actions within 72 hours are not considered Level A and Level B TSAs because they have greater than 24 hours to be completed. Therefore, an NEI 16-02 Appendix E

validation is not required. These actions are defined in 0-ADM-116 and include deployment of the temporary flood protection features. There are no manual actions required during the storm, although actions may be taken to protect economic assets. As such, there are no TSAs for this site response.

6.3.3.2 DEMONSTRATION ALL TSAS ARE FEASIBLE

As discussed in Section 6.3.3.1, there are no TSAs because the warning time exceeds the requirements set in NEI 12-06 Appendix E and therefore a validation was not performed. However, it is stated in NEE016-PR-001 (Reference 15) that as a result of the NTTF Recommendation 2.3 Walkdown Report, the staffing levels were verified using reasonable simulation and were determined to be adequate and that the flooding protection procedure could be implemented as written for performance of these activities prior to storm arrival.

6.3.3.3 ESTABLISHING UNAMBIGUOUS PROCEDURAL TRIGGERS

Hurricane Season Readiness procedure 0-ADM-116 (Reference 17) is initiated 72 hours prior to arrival of a projected severe weather event or as directed by the Emergency Preparedness Manager. A severe weather event is defined as a "tropical cyclone with surface winds greater than or equal to 39 mph." Reliable information on approaching severe weather disturbances is available from the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS).

6.3.3.4 PROCEDURALIZED AND CLEAR ORGANIZATIONAL RESPONSE TO A FLOOD

0-ADM-116 (Reference 17) provides clear guidance on actions that are required to be taken once a hurricane is expected. The Shift Manager is ultimately responsible for all actions taken. There are no manual actions required during the event and all site preparations occur well in advance of the storm arrival, starting 72 hours beforehand.

6.3.3.5 DETAILED FLOOD RESPONSE TIMELINE

Given the amount of time for site flood preparations, a detailed flood response timeline is not required.

6.3.3.6 ACCOUNTING FOR THE EXPECTED ENVIRONMENTAL CONDITIONS

There are no manual actions required during the PMSS and therefore expected environmental conditions are not applicable.

6.3.3.7 DEMONSTRATION OF ADEQUATE SITE RESPONSE

The site response to a PMSS has been demonstrated as adequate by meeting the guidelines in NEI 16-05 Appendix C. All required actions occur prior to storm arrival based on a 72-hour warning time, which provides adequate time for all site preparations. There are no manual actions required during the Storm Surge event.

6.4 SEICHE – PATH 2

6.4.1 DESCRIPTION OF FLOOD IMPACT

Based on the conclusions developed in calculation FPL062-CALC-013 (Reference 14) and confirmed by the Supplement to Staff Assessment (Reference 10), there is no credible driving force for a Seiche aside from the PMSS within the Biscayne Bay and therefore this event is not applicable to PTN. No increase in water levels calculated.

6.4.2 ADEQUATE APM JUSTIFICATION AND RELIABILITY OF FLOOD PROTECTION

As discussed in Section 6.4.1, no maximum flood height was calculated for this mechanism and therefore APM and reliability of flood protection features are not applicable.

6.4.3 ADEQUATE OVERALL SITE RESPONSE

There are no required manual actions for this response to be successful and, therefore, an evaluation of the overall site response is not applicable.

6.5 TSUNAMI – PATH 2

6.5.1 DESCRIPTION OF FLOOD IMPACT

The primary feature protecting the site from the PMT is 'site topography and grading', which is a Type 1 feature per NEI 16-05 Appendix B Section B.1. Table 8 provides the relevant PMT elevations, site grade, and APM.

Table 8 – Tsunami Flood Elevations

PMT Stillwater Elevation	*PMT Maximum Water Level*	*PMT and Coincident Waves*	*Site Grade*	*APM*
12.1 ft NAVD88	13.9 ft NAVD88	14.8 ft NAVD88	15.7 ft NAVD88	0.9 ft

Given that the maximum elevation of the PMT with wave runup is below site grade, this flood mechanism does not adversely affect Key SSCs. The protection feature (site grade and topography) is permanent and passive, requiring no manual actions. APM justification is provided below in Section 6.5.2.

6.5.2 ADEQUATE APM JUSTIFICATION AND RELIABILITY OF FLOOD PROTECTION

An APM of 0.9 ft is acceptable because per NEI 16-05 Appendix B Section B.1 "Negligible or zero APM can be justified as acceptable if the use of conservative inputs, assumptions, and/or methods in the flood hazard reevaluation can be established". Since the AIMs used in this PMT analysis are conservative, this APM is adequate. The following are examples of conservatisms used in the PMT flood analysis:

1. Tsunami wave and runup flooding was analyzed for the PTN Units 6 & 7 SAR (Reference 28, Section 2.4.6). The approach taken is aligned with the PMT evaluation methodology proposed in NUREG/CR-6966 (Reference 29).

2. Delft3D-FLOW, which is the computer code used to simulate the PMT, assumes hydrostatic pressure distribution and therefore ignores frequency dispersion. As a result, tsunami propagation model simulations generally show steeper wave fronts with larger wave amplitudes compared to analytical solutions or benchmark laboratory test results. The shallow water conditions adopted in Delft3D-FLOW therefore are capable of resolving the tsunami wave propagation where the frequency dispersion is not significant and would be conservative in simulating the near shore tsunami amplitude (Reference 28, Section 2.4.6.4.1.1).

3. Several major tsunamigenic sources were evaluated, with the most bounding being an earthquake in the Azores-Gibraltar fracture zone. Several model conservatisms are used in this specific simulation (Reference 28, Section 2.4.6.4.1.2):

    a. The antecedent water level including the 10 percent exceedance high spring tide, initial rise, and long-term sea level rise, is used as the initial water level for the tsunami model. These methods used for estimating the antecedent water level in the PTN Units 6 & 7 SAR are different than what was done in the FHRR, but ultimately resulted in higher, more conservative values (Reference 2, Section 4.6.1).

    b. The south model boundary is set along the northern coastlines of the Dominican Republic, Haiti, and Cuba. The small passage between Haiti and Cuba is conservatively assumed to be blocked.

    c. A Manning's n of 0.02 is used conservatively in the final analysis because the Manning's n sensitivity analysis results indicate that lower values give higher maximum tsunami water level at the site.

Site grade and topography, with a site grade elevation of 15.7 ft NAVD88, is a permanent and passive protection feature that's already credited as part of the site CDB and therefore meets the criteria for reliability provided by NEI 16-05 Section B.2.

6.5.3 ADEQUATE OVERALL SITE RESPONSE

There are no required manual actions and, therefore, an evaluation of the overall site response is not necessary.

7 CONCLUSION

The FHRR showed that four (4) flooding mechanisms were not bounded by the CDB and were required to be evaluated in this FE. For the first mechanism, LIP, there were two scenarios identified. Scenario A occurs during normal plant operation with no warning time, temporary flood protection features, or manual actions credited. To ensure adequate APM and reliability, seals will be added to specific manholes and conduit penetrations, tracked under AR 01977483-03. As defense in depth the site may take compensatory actions under procedure Severe Weather Preparations procedure 0-ONOP-103.3 (Reference 16), which includes additional actions that were intended for large hurricanes but is now also implemented in the event of flooding/heavy rainfall.

LIP Scenario B occurs while the site is under Hurricane Season Readiness procedure 0-ADM-116. The calculated water level in the CCW pump rooms without crediting any additional protection features exceeds the minimum Key SSC height of the CCW pumps. Therefore, PTN credits the portable dewatering pumps deployed as part of hurricane preparations to lower the flood levels in these rooms. Crediting the dewatering pumps, the calculated maximum water height is now bounded by the Scenario A event. This FE demonstrated APM was adequate, the protection features are reliable, and the site response for a Scenario B is adequate. Therefore, Key SSCs are not impacted.

For the second mechanism not bounded by the CDB, the PMSS, each of the credited flood protection features was evaluated. To ensure adequate APM and reliability, there are ten (10) changes planned that are tracked under AR 01977483-03. With the implementation of these changes, all Key SSCs will be adequately protected from the reevaluated flood levels. The only manual actions required are deployment of the temporary flood protection features. Given the 72-hour warning for a PMH that would cause this PMSS, significant time is available for all actions. There are no TSAs for this mechanism.

The third and fourth mechanisms not bounded by the CDB are the PMT and Seiche. All buildings that have Key SSCs have been shown to have adequate APM since the flood water will not exceed site grade for these events. Therefore, no water intrusion or accumulation is anticipated in rooms with Key SSCs and the plant will be able to maintain all KSFs throughout the event. There are no manual actions relied on.

Finally, for all four (4) mechanisms, the MSA has demonstrated that mitigating strategies developed within FLEX will be available to maintain/restore KSFs as a defense in depth measure. Additional information can be found in the MSA (Reference 20).

This submittal completes the actions related to External Flooding Response required by the March 12, 2012 10 CFR 50.54(f) RFI. It is not anticipated that Phase 2 decision making will be necessary based on the information provided in this FE.

8 REFERENCES

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 (ML12053A340).

2. L-2013-087, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Flood Hazard Reevaluation of Recommendation 2.1, dated March 11, 2013 (ML13095A196).

3. L-2013-133, Errata Corrections to FPL Letter L-2013-087, dated April 8, 2013 (ML13114A259).

4. NRC Staff Requirements Memoranda to COMSECY-14-0037, Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards, dated March 30, 2015 (ML15089A236).

5. Nuclear Energy Institute (NEI), Report NEI 16-05, Rev. 1, External Flooding Assessment Guidelines (ML16165A178).

6. U.S. Nuclear Regulatory Commission, JLD-ISG-2016-01, Rev. 0, Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation; Focused Evaluation and Integrated Assessment (ML16162A301).

7. NRC Letter, Coordination of Requests for Information Regarding Flooding Hazard Reevaluations and Mitigating Strategies for Beyond-Design-Basis External Events, dated September 1, 2015 (ML15174A257).

8. Nuclear Energy Institute (NEI), Report NEI 12-06, Rev. 2, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide (ML16005A625).

9. Turkey Point Nuclear Generating, Unit Nos. 3 and 4 – Staff Assessment of Response to 10 CFR 50.54(f) Information Request – Flood-Causing Mechanism Reevaluation (TAC Nos. MF1114 and MF1115), dated December 4, 2014 (ML14324A816).

10. Turkey Point Nuclear Generating, Unit Nos. 3 and 4 – Supplement to Staff Assessment of Response to 10 CFR 50.54(f) Information Request – Flood-Causing Mechanisms Reevaluation (CAC No. MF1114 and MF1115), dated November 4, 2015 (ML15301A200).

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13. NOAA Hydrometeorological Report No. 52, Application of Probable Maximum Precipitation Estimates – United States East of the 105th Meridian.

14. FPL062-CALC-013, Rev. 0, Seiche Evaluation on Biscayne Bay.

15. NEE016-PR-001, Rev. 1, Integrated Assessment Report.

16. 0-ONOP-103.3, Rev. 21, Severe Weather Preparations.

17. 0-ADM-116, Rev. 19, Hurricane Season Readiness.

18. FPL062-CALC-004, Rev. 2, Effects of Local Intense Precipitation.

19. PTN-ENG-SECS-13-012, Rev. 1, Flooding Hazard Reevaluation Report FPL062-PR-001, Rev. 0, in response to the 50.54(f) information request regarding NTTF Recommendation 2.1: Flooding for PTN U3 & U4.

20. NEETPX181-REPT-001, Rev. 1, 2016 Mitigating Strategies Assessment for Flooding Documentation Requirements at the Turkey Point Nuclear Site.

21. L-2014-257, Supplemental Information Regarding the Flood Hazard Reevaluation, August 7, 2014 (ML14234A085).

22. FPL062-CALC-002, Rev. 2, Effects of Local Intense Precipitation on Critical Selected Powerblock Rooms.

23. FPL062-CALC-003, Rev. 1, Local intense Precipitation (LIP) – Precipitation Distribution.

24. FPL062-CALC-012, Rev. 0, Probable Maximum Storm Surge (PMSS) Analyses.

25. FPL062-CALC-014, Rev. 2, PMSS Wave Runup Evaluation.

26. FPL062-CALC-017, Rev. 2, Hydrostatic and Hydrodynamic Loads Evaluation.

27. Alternatives Analysis for PTN Flooding Hazards Modifications, Rev. 0, 18 November 2016.

28. Turkey Point Units 6 & 7, COL Application, Part 2 – FSAR, Rev. 8 (ML16250A282).

29. NUREG/CR-6966, Tsunami Hazard Assessment at Nuclear Power Plant Sites in the United States of America (ML082810348).

30. Updated Final Safety Analysis Report, Turkey Point Units 3 & 4, Rev. 429.

31. L-2014-023, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Flood Hazard Reevaluation Report (FHRR), Recommendation 2.1 – Flooding, January 31, 2014 (ML14055A365).

32. EC 279049, Rev. 6, NEI 12-07 Flooding Walkdown and Flood Hazard Reevaluation Improvements.

33. 5613-E-6 Sh. 1, Rev. 20, Emergency Diesel Generator 3A Load List.

34. 5613-E-6 Sh. 2, Rev. 11, Emergency Diesel Generator 3B Load List.

35. 5614-E-6 Sh. 1, Rev. 19, Emergency Diesel Generator 4A Load List.

36. 5614-E-6 Sh. 2, Rev. 12, Emergency Diesel – Generator 4B Load List.

37. 5610-E-303 Sh. 61, Rev. 8, N/E Lighting Distribution Panel DP-312.

38. 5610-E-303 Sh. 81, Rev. 6, N/E Distribution PNL DP#412 Located on DWG. E-218 & E-119.

39. 5610-E-200 Sh. 2, Rev. 0, Lighting Distribution.

40. 5613-C-1791, Rev. 0, 4160V Switchgear Anchorage Details.