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

July 3, 2018

Mr. Mano Nazar
President, Nuclear Division
and Chief Nuclear Officer
Florida Power & Light Company
Mail Stop: EX/JB
700 Universe Blvd
Juno Beach, FL 33408

SUBJECT: TURKEY POINT NUCLEAR GENERATING, UNITS 3 AND 4 – STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION (EPID NOS. 000495/05000250/L-2017-JLD-0029 AND 000495/05000251/L-2017-JLD-0029)

Dear Mr. Nazar:

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, under Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f), (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807). Enclosure 2 to the 50.54(f) letter requested that licensees reevaluate flood hazards for their sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits and combined licenses (ADAMS Accession No. ML12056A046). By letter dated March 11, 2013 (ADAMS Accession No. ML130950216), as supplemented by letters dated January 31, 2014 (ADAMS Accession No. ML14055A365), February 26, 2014 (ADAMS Accession No. ML14073A065), April 25, 2014 (ADAMS Accession No. ML14149A479), and August 7, 2014 (ADAMS Accession No. ML14234A085), Florida Power and Light Company (FPL, the licensee) responded to this request for Turkey Point Nuclear Generating, Units 3 and 4 (Turkey Point).

After its review of the licensee's response, by letter dated December 4, 2014 (ADAMS Accession No. ML14324A816), the NRC staff issued the staff assessment of the flood hazard reevaluation report (FHRR) for Turkey Point. By letter dated November 4, 2015 (ADAMS Accession No. ML15301A200), the NRC issued a supplement to its staff assessment of flood-causing mechanisms reevaluation for Turkey Point (hereafter referred to as the Mitigating Strategies Flood Hazard Information (MSFHI) letter). The MSFHI letter provided the reevaluated flood hazard mechanisms that exceeded the current design basis (CDB) for Turkey Point and parameters that are suitable for other assessments associated with NTTF Recommendation 2.1, "Flooding." As stated in the letter, because the local intense precipitation (LIP), seiche, tsunami, storm surge, and combined events flood-causing mechanisms at Turkey Point are not bounded by the plant's CDB, additional assessments of these flood hazard mechanisms are necessary.

By letter dated June 29, 2017 (ADAMS Accession No. ML17212B180), the licensee submitted the focused evaluation (FE) for Turkey Point. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the MSFHI letter, that: 1) a flood mechanism is bounded based on further reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response is provided if the unbounded mechanism is local intense precipitation. The purpose of this letter is to provide the NRC's assessment of the Turkey Point FE.

As set forth in the attached staff assessment, the NRC staff has concluded that the Turkey Point FE was performed consistent with the guidance described in Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178). Guidance document NEI 16-05, Revision 1, has been endorsed by Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301). The NRC staff has further concluded that the licensee has demonstrated that effective flood protection, if appropriately implemented, exists for the LIP, tsunami, PMSS, sieche and combined events flood mechanisms during a beyond-design-basis external flooding event at Turkey Point. This closes out the licensee's response for Turkey Point for the reevaluated flooding hazard portion of the 50.54(f) letter and the NRC's efforts associated with EPID Nos. 000495/05000250/L-2017-JLD-0029 AND 000495/05000251/L-2017-JLD-0029.

If you have any questions, please contact me at 301-415-1617 or by e-mail at Frankie.Vega@nrc.gov.

Sincerely,

Frankie Vega, Project Manager
Beyond-Design-Basis Management Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

Docket Nos: 50-250 and 50-251

Enclosure:
Staff Assessment Related to the
Flooding Focused Evaluation for Turkey Point

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STAFF ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE FOCUSED EVALUATION FOR

TURKEY POINT NUCLEAR GENERATING, UNIT NOS. 3 AND 4

AS A RESULT OF THE REEVALUATED FLOODING HAZARD NEAR-TERM TASK FORCE

RECOMMENDATION 2.1 - FLOODING

EPID NO. 000495/05000250/L-2017-JLD-0029 AND 000495/05000251/L-2017-JLD-0029L

1.0 INTRODUCTION

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, under Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807).

Enclosure 2 of the 50.54(f) letter requested that licensees reevaluate flood hazards for their respective sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits and combined licenses (ADAMS Accession No. ML12056A046). If the reevaluated hazard for any flood-causing mechanism is not bounded by the plant's current design basis (CDB) flood hazard, an additional assessment of plant response would be necessary. Specifically, the 50.54(f) letter stated that an integrated assessment should be submitted, and described the information that the integrated assessment should contain. By letter dated November 30, 2012 (ADAMS Accession No. ML12311A214), the NRC staff issued Japan Lessons-Learned Project Directorate (JLD) interim staff guidance (ISG) JLD-ISG-2012-05, "Guidance for Performing the Integrated Assessment for External Flooding."

On June 30, 2015 (ADAMS Accession No. ML15153A104), the NRC staff issued COMSECY-15-0019, describing the closure plan for the reevaluation of flooding hazards for operating nuclear power plants. The Commission approved the closure plan on July 28, 2015 (ADAMS Accession No. ML15209A682). COMSECY-15-0019 outlines a revised process for addressing cases in which the reevaluated flood hazard is not bounded by the plant's CDB. The revised process describes a graded approach in which licensees with hazards exceeding their CDB flood will not be required to complete an integrated assessment, but instead will perform a focused evaluation (FE). As part of the FE, licensees will assess the impact of the hazard(s) on their site and then evaluate and implement any necessary programmatic, procedural, or plant modifications to address the hazard exceedance.

Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178), has been endorsed by the NRC as an appropriate methodology for licensees to perform the focused evaluation in response to the 50.54(f) letter. The NRC's endorsement of NEI 16-05, including exceptions, clarifications, and additions, is

described in NRC JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301).

2.0 BACKGROUND

This provides the final NRC staff assessment associated with the information that the licensee provided in response to the reevaluated flooding hazard portion of the 50.54(f) letter. Therefore, this background section includes a summary description of the reevaluated flood information provided by the licensee and the associated assessments performed by the NRC staff. The reevaluated flood information includes: 1) the flood hazard reevaluation report (FHRR); 2) the mitigation strategies assessment (MSA); and 3) the focused evaluation.

Flood Hazard Reevaluation Report

By letter dated March 11, 2013 (ADAMS Accession No. ML130950216), as supplemented by letters dated January 31, 2014 (ADAMS Accession No. ML14055A365), February 26, 2014 (ADAMS Accession No. ML14073A065), April 25, 2014 (ADAMS Accession No. ML14149A479), and August 7, 2014 (ADAMS Accession No. ML14234A085), Florida Power and Light Company (FPL, the licensee) submitted its flood hazard reevaluation report (FHRR) for Turkey Point. After reviewing the licensee's response, by letter dated December 4, 2014 (ADAMS Accession No. ML14324A816), the NRC staff issued the staff assessment of the FHRR for Turkey Point. By letter dated November 4, 2015 (ADAMS Accession No. ML15301A200), the NRC issued a supplement to its staff assessment of flood-causing mechanisms reevaluation for Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point) (hereafter referred to as the Mitigating Strategies Flood Hazard Information (MSFHI) letter). The MSFHI letter discusses the reevaluated flood hazard mechanisms that exceeded the CDB for Turkey Point and parameters that are a suitable input for the MSA and the FE. As stated in the MSFHI letter, because the local intense precipitation (LIP), seiche, tsunami, storm surge, and combined events flooding mechanisms at Turkey Point are not bounded by the plant's CDB, additional assessments of the flood hazard mechanisms are necessary.

Mitigation Strategies Assessment

By letter dated December 20, 2016 (ADAMS Accession No. ML17012A065), the licensee submitted its MSA for Turkey Point for review by the NRC staff. The MSAs are intended to confirm that licensees have adequately addressed the reevaluated flooding hazards within their mitigation strategies for beyond-design-basis external events. By letter dated June 27, 2017 (ADAMS Accession No. ML17143A034), the NRC issued its assessment of the Turkey Point MSA. The NRC staff concluded that the Turkey Point MSA was performed consistent with the guidance described in Appendix G of Nuclear Energy Institute 12-06, Revision 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" (ADAMS Accession No. ML16005A625). The NRC's endorsement of NEI 12-06, Revision 2, is described in JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15357A163). The NRC staff further concluded that the licensee has demonstrated that the mitigation strategies, if appropriately implemented, are reasonably protected from reevaluated flood hazards conditions for beyond-design-basis external events.

Focused Evaluation

By letter dated June 29, 2017 (ADAMS Accession No. ML17212B180), the licensee submitted its FE for Turkey Point. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the MSFHI letter, that: 1) a flood mechanism is bounded based on further reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response is provided if the unbounded mechanism is local intense precipitation. These 3 options associated with performing an FE are referred to as Path 1, 2, or 3, as described in NEI 16-05, Revision 1. The purpose of this staff assessment is to provide the results of the NRC's evaluation of the Turkey Point FE.

3.0 TECHNICAL EVALUATION

The licensee stated that its FE followed Path 2 of NEI 16-05, Revision 1 and utilized Appendices B and C for guidance on evaluating the site strategy. The Turkey Point FE addresses the LIP, probable maximum tsunami (PMT), seiche and probable maximum storm surge (PMSS) flooding mechanisms, which were found to exceed the plant's CDB as described in the FHRR and MSFHI letter. This technical evaluation will address the following topics: characterization and evaluation of flood parameters; evaluation of flood impact assessments; evaluation of available physical margin; reliability of flood protection features; and overall site response.

3.1 Characterization of Flood Parameters

The licensee assessed the potential impacts of the following flood-causing mechanisms that were not bounded by the CDB: LIP; hurricane induced PMSS, PMT, seiche and combined events. The licensee stated that LIP and PMSS exceed the corresponding flooding hazards in the CDB for the Turkey Point site. The licensee also states that PMT and seiche flood hazards are not addressed in the CDB and are thus, not bounded. The licensee explained that the Turkey Point site is not affected by seiche flooding. The NRC agrees with this assessment for the seiche flood hazard as documented in the FHRR staff assessment. The licensee also stated that the combined events considered in the flooding reevaluation are included in the reevaluations performed for the PMSS and PMT events and therefore, combined events are not evaluated separately. The NRC agrees with this assessment for combined events.

The PMSS and PMT flood elevations, associated effects (AE) and flood event duration (FED) parameters that are used as input to the FE are the same as those that were used for the MSA. The licensee has revised the LIP flooding analysis since the issuance of the MSFHI letter. The updated LIP analysis now takes credit for dewatering pumps in the Component Cooling Water (CCW) pump rooms during a LIP Scenario B. The FED parameters for the LIP events were provided by the licensee in the FE. The NRC staff review of the FED and AE parameters for the four flooding mechanisms mentioned above is documented in Section 3.5 of this assessment.

As previously documented in its MSA and FE, the licensee considered two LIP scenarios. The LIP Scenario A occurs during normal plant operations when no special flood protection measures required for hurricane readiness are in place. The LIP Scenario B occurs when the plant is operating under hurricane readiness procedures.

For LIP Scenario A the maximum water elevation reported was 17.2 feet (ft.) North American Vertical Datum of 1988 (NAVD88) and for LIP Scenario B the maximum calculated water elevation was 20.8 ft. NAVD88 without any modifications. Both of these elevations were

reported in the CCW areas. The licensee stated that there are no appreciable differences in water level between the two LIP scenarios at any locations other than at the CCW pump rooms. The FE credits passive and active permanent flooding protection features, already credited as part of the CDB, to demonstrate that key structures, systems, and components (SSCs) are protected against the LIP Scenario A event. The licensee indicated that the site does not require additional manual actions by plant personnel to protect key SSCs; therefore, an evaluation of the overall site response was not necessary for a LIP Scenario A event.

Regarding LIP Scenario B, the maximum estimated flood elevation of 20.8 ft. NAVD88 can potentially impact key SSCs located in the CCW pump rooms. However, by crediting the use of the dewatering pumps located in the CCW pump rooms this flood elevation is reduced to 16.6 ft. NAVD88, which is below the height of the key SSC. The FE credits passive and active permanent flooding protection features to demonstrate that key SSCs are protected from the LIP Scenario B event. The licensee indicated that turning on and monitoring the dewatering pumps in the CCW pump rooms are the only manual actions required for this scenario; therefore, an evaluation of the overall site response was included in the FE.

For PMSS, the reevaluated total flood elevations reported in the FE including wind wave effects ranged from 17.1 ft. NAVD88 to 18.2 ft. NAVD88 at the site. The FE credits permanent and temporary flood protection features already credited as part of the site CDB to demonstrate that key SSCs are protected from the PMSS floods. The licensee provided an evaluation of the overall site response as part of the FE to address the adequacy of the deployment of the temporary flood protection features. The licensee determined that no manual actions are required during the PMSS event.

For the PMT, the licensee calculated the maximum water surface elevation for the Turkey Point site to be 14.8 ft. NAVD88 (including wave runup), which remains below plant grade at 15.7 ft. NAVD88. The licensee indicated that the site does not require additional manual actions by plant personnel to protect key SSCs; therefore, an evaluation of the overall site response was not necessary for PMT.

The NRC staff reviewed the LIP, PMSS and PMT parameters listed in the licensee's FE. Based on the review documented in Section 3.5 of this assessment, the staff concludes that the licensee's characterization of the LIP, PMSS and PMT events in the FE is appropriate.

3.2 Evaluation of Flood Impact Assessment for LIP

3.2.1 Description of Impact of Unbounded Hazard

The Turkey Point FE identified the potential impacts on key SSCs as a result of water ingress due to LIP. The LIP event leads to flood water surface elevations above the plant floor elevations at some locations. In order to assess the impacts of the unbounded flood levels, the licensee identified the maximum water surface elevations at the exterior door openings, maximum flood depths above the door threshold, and duration of when the flood levels are above the door threshold. With this information, the licensee assessed the impacts of water ingress and potential for accumulation into rooms housing key SSCs. In addition, the licensee indicated that it analyzed the potential for impacts of the unbounded flood levels on the exterior doors of the plant buildings, including their hydrostatic and hydrodynamic loading.

The licensee's evaluation indicated runoff due to the LIP events from the Turbine Building areas is expected to drain and accumulate in the Units 3 and 4 Condenser Pits. Water accumulation

in these condenser pits is not expected to affect safety-related SSCs since the volume of water accumulated in these pits is lower than the capacity of the pits. However, water accumulation is expected at multiple locations prior to the volume ending up in these pits. In summary, water accumulation up to 1.5 ft. is expected around the site with higher water accumulations expected around the CCW3 and CCW4 areas. Maximum Flood elevations for both LIP scenarios are provided in Table 5.1.2 of the licensee's integrated assessment report, NEE016-PR-001, "Integrated Assessment Report," Revision 1. The licensee stated that flood waters could ingress certain locations through doors and manholes and could propagate internally and eventually impact key SSCs. A detailed description of the potential impacts to key SSCs from the LIP flooding events is provided in NEE16-PR-001.

Based on this evaluation, the licensee concluded that internal flooding from the LIP events will not affect any key SSCs. The licensee emphasized that the following modifications would be needed to support this conclusion:

- Add watertight seals to specific manholes and conduit penetrations as identified in Section 5.2 of the FE. This action is tracked via condition report AR 01977483-03.

The NRC staff reviewed the information provided by the licensee in order to assure that adequate flood parameters were used for the calculation of water ingress and water accumulation.

3.2.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

Maximum LIP water elevations at points of interest (POI) inside and outside of the protected areas are provided in Table 5.1.2 of FPL's integrated assessment report, NEE016-PR-001, Revision 1. Critical elevations of key SSCs and their specific location within each fire zone is provided Table 6.0.1 of NEE016-PR-001, Revision 1. The maximum flood elevation for each fire zone is determined by locating the POIs closest to the exterior doors of the fire zone. The licensee compared the flood elevations with the elevations of critical SSCs in each fire zone and calculated available physical margin (APM) of key SSCs. A summary of the most relevant APM results is provided in Table 3 of the FE. As shown in Table 3 of the FE, the minimum APM value obtained was 0.01 ft. Based on this information and the conservative assumptions used in the LIP flood analysis, the licensee concludes that the APM for the LIP is adequate.

The staff reviewed the LIP internal flooding evaluation and its effects on the safety-related buildings provided in Attachment C of FPL's report NEE016-PR-001, Revision 1. Specifically, the staff reviewed the critical depths of SSCs and the maximum water elevations estimated for each zone. The staff also confirmed the APM values summarized in the FE. Also, the staff reviewed the assumptions and input parameters used in the LIP analysis and agrees that the licensee's estimation of water ingress and accumulation is reasonable. Therefore, the NRC staff concludes that the licensee has demonstrated that, provided the modifications described in Section 5.2 of the FE are put in place, there is sufficient APM, as described in Appendix B of NEI 16-05, Revision 1.

<u>Evaluation of Reliability of Protection Features</u>

Turkey Point relies on permanent passive flooding protection features such as buildings, exterior doors, and manhole cover seals to provide protection from the LIP flooding events. The only active flood protection features credited are the sump pumps located in each of the switchgear rooms for LIP scenario A and the dewatering pumps located in the CCW pump

rooms for LIP scenario B. All these flood protection features, except the dewatering pumps, were credited as part of the CDB. The dewatering pumps credited in the LIP scenario B have been integrated as part of FPL's procedure, 0-ADM-116, "Hurricane Season Readiness Procedure."

A detailed evaluation of the flood protection features at Turkey Point for both LIP events is provided in Section 7.0 of FPL's report NEE016-PR-001, Revision 1. A summary of this evaluation is provided below:

- Manhole cover seals - The licensee assessed the seals' ability to prevent leakage into the manhole system and into the lower levels of the plant's flood-protected areas. Since the manhole cover will be the primary barrier to flood water entering the manhole system, the licensee proposed to install watertight flood seals on specific manhole covers to perform a flood protection function. This proposed modification was documented in Section 5.2 of the FE and is tracked via condition report AR 01977483-03. In addition, the licensee stated that the manholes and seals are inspected on a yearly basis under inspection procedure PM 37176.

- Flood protection doors – The licensee assessed the exterior door's ability to maintain structural integrity when exposed to LIP flood waters. The licensee stated that given the relatively low flood water height expected from the LIP event, the structural integrity of such doors will not be challenged.

- Conduit penetrations seals – The licensee evaluated the potential sources of water ingress into the flood protection boundary. The licensee identified the unsealed conduits that could potentially contribute to water ingress and proposed installing flood seals that provide watertight defense against water ingress. These modifications are tracked via condition report AR01977483-03.

- Roof structure loads – The licensee evaluated the impact of the water loads on critical roof structures. The licensee evaluated the Containment, Auxiliary, Turbine, Radwaste and Emergency Diesel Generator Buildings and concluded that the existing design loads bound the LIP rain load and therefore, the roof structures of these buildings are acceptable for the LIP event.

- Sump pumps located in switchgear rooms – These pumps are already credited as part of the CDB. No further evaluation was provided. Since these features are already credited as part of the plant's CDB flood protection, the NRC staff concludes that a reliability analysis of these features is not necessary in accordance with the guidance found in NEI 16-05, Revision 1.

- Dewatering pumps (Scenario B) – In its FE, the licensee described the pumps selected, their nominal pump capacity and storage location. In addition, the licensee stated that plant inspection procedure PM 44109-01 was updated to include such pumps as part of routine inspections prior to hurricane season. Based on this information, and given that the pumping capacity exceeds the credited rate, the licensee concluded that these pumps were reliable based on the criteria described in Appendix B of NEI 16-05, Revision 1.

Because increased focus has been placed on flood protection since the accident at Fukushima, licensees and NRC inspectors have identified deficiencies with equipment, procedures, and

analyses relied on to either prevent or mitigate the effects of external flooding at a number of licensed facilities. Recent examples include those found in Information Notice 2015-01, "Degraded Ability to Mitigate Flooding Events" (ADAMS Accession No. ML14279A268). In addition, the NRC is cooperatively performing research with the Electric Power Research Institute to develop flood protection systems guidance that focuses on flood protection feature descriptions, design criteria, inspections, and available testing methods under a memorandum of understanding dated September 28, 2016 (ADAMS Accession No. ML16223A495). The NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis. The NRC staff further expects that continued research involving flood protection systems will be performed and shared with licensees in accordance with the guidance provided in Management Directive 8.7, "Reactor Operating Experience Program" (ADAMS Accession No. ML122750292), as appropriate.

The staff reviewed the methodologies, assumptions and input parameter values used to estimate the LIP water loads applied to the flood protection features and found these to be acceptable and reasonable. The NRC staff also reviewed the information provided by the licensee in FPL's integrated assessment report, NEE016-PR-001, Revision 1 which provides the calculations and engineering analysis used to evaluate the flood protection features described above. The staff noted that the licensee used engineering codes and standards in these calculations and evaluations in accordance with NEI 16-05, Revision 1. The NRC staff also reviewed the condition reports referenced above to ensure that the planned modifications are being properly documented and tracked for future implementation. If the modifications are completed as described by the licensee, the NRC staff concludes that the licensee has demonstrated that the flood protection features described above are reliable to maintain key safety functions, as described in Appendix B of NEI 16-05, Revision 1.

3.2.3 Overall Site Response

For LIP Scenario A, the licensee does not rely on any manual actions in order to respond to the LIP event; therefore, there is no need to review overall site response.

For the LIP Scenario B, the licensee relies on portable dewatering pumps to remove water in the CCW pump rooms. As stated above, this scenario occurs while the site is operating under 0-ADM-116, "Hurricane Season Readiness Procedure," and therefore, these pumps will already have been deployed. Thus, the only manual action required for the LIP is to turn the pumps on and then periodically monitor them. The FE references the procedures to be followed and describes the actions to be taken in order for operators to turn on these pumps once a hurricane or severe weather is expected. The licensee stated that plant procedure 0-ADM-116 is initiated 72 hours prior to arrival of a projected severe weather event. Additionally, the licensee stated that external environmental conditions will not have an adverse impact on the ability of the plant personnel to turn on these pumps. Finally, the licensee stated that it used the guidance in NEI 16-05, Revision 1, Appendix C, to demonstrate adequate site response to a LIP Scenario B.

Based on the licensee's FE description, as confirmed by the NRC staff's review of the licensee's procedures, 0-ADM-116, the staff concludes that the licensee's site response evaluation has been performed in accordance with NEI 16-05, Revision 1, Appendix C, and is therefore acceptable

3.3 Evaluation of Flood Impact Assessment for Probable Maximum Storm Surge

3.3.1 Description of Impact of Unbounded Hazard

In its FE, the licensee provided the maximum reevaluated PMSS flood levels along the site's flood protection barrier system. As shown in Table 4 of the FE, the maximum flood level is expected along the east side of the site's flood barrier wall. The licensee's detailed analysis of the potential impacts on key SSCs as a result PMSS flood is provided FPL's report, NEE016-PR-001, Revision 1. The licensee's internal flood analysis, provided in Attachment J of NEE016-PR-001, Revision 1, described potential flood propagation pathways, estimated flood levels in rooms and compared these levels to the elevations of critical SSCs. The licensee stated that flood waters have the potential to ingress rooms through doors, conduits and piping penetrations, stoplogs and manholes. The licensee credits both, permanent and temporary flood protection features to protect key SSC against the PMSS floods. Table 6.0.1 of NEE016-PR-001, Revision 1, includes the locations evaluated, critical height of SSCs and the credited flood protection features in each of the rooms. The licensee stated that, with the modifications described in Section 5.2 of the FE, no key SSCs are impacted by flood waters during the PMSS event.

3.3.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

The licensee relies on the use of permanent and temporary flood protection features to provide protection against the PMSS flood. Table 4 of the FE provides APM values for the flood protection barrier wall that ranged from 0.1 ft. to 1.5 ft. These APM values do not include the 20-year sea level increase which was calculated to be .39 ft. If the 20-year sea level increase were to be added to the re-evaluated flood hazard levels several sections of the wall would require modification to increase the height of the flood barrier. In its MSA and FE, the licensee committed to modify the flood barrier wall to account for the 20-year sea level wall.

The PMSS internal flooding evaluation show that the APM values obtained from all the zones evaluated were bounded by the APM values obtained for the LIP event except for the Residual Heat Removal (RHR) Heat Exchanger rooms, RHR pump rooms, and CCW pump rooms. For these zones a limiting APM value of 0.76 ft. was obtained as shown in FE Table 5. As described in Section 3.2.2 of this assessment, the minimum APM obtained from the LIP flood event was 0.01 ft. Finally, the licensee concluded that APM results for the PMSS flood were estimated to be adequate based on the conservative assumptions, inputs and methods used to calculate the maximum storm surge flood levels.

The staff reviewed the PMSS internal flooding calculations and its effects on the safety-related SSCs provided in Attachment J of FPL's integrated assessment report, NEE016-PR-001, Revision 1. Specifically, the staff reviewed the critical depths of SSCs and the maximum water elevations estimated for each zone. The staff also confirmed the APM values summarized in the FE. Also, the staff reviewed the assumptions and input parameters used in the PMSS analysis and agrees that the licensee's estimation of water ingress and accumulation is reasonable. Therefore, the NRC staff concludes that the licensee has demonstrated that, provided the changes and modifications described in Section 5.2 of the FE are put in place, there is sufficient APM, as described in Appendix B of NEI 16-05, Revision 1.

<u>Evaluation of Reliability of Protection Features</u>

As stated in Section 6.3.2 of the FE, temporary flood protection features credited are Jersey barriers, stoplogs, drain plugs, and sandbags around drains where drain plugs cannot be used and the permanent protection features credited are the manholes, conduit and pipe penetration seals, existing structures, and site grade. Section 5.2 of the FE provides a summary of plant

modifications and changes needed to ensure adequate APM and reliability of the flood protection features for the reevaluated PMSS. A detailed evaluation of the flood protection features at Turkey Point is provided in Section 7.0 of FPL's report NEE016-PR-001, Revision 1. A summary of this evaluation and the proposed modifications are provided below:

- Refueling water storage tanks – these safety-related tanks are outside the flood-protected area. The licensee compared the PMSS hydrostatic, hydrodynamic, and sedimentation loads to the tank's design loads and concluded that the tanks and connected piping and flanges are qualified for the reevaluated PMSS. No modifications or changes were identified.

- Jersey barriers – these barriers are responsible for protecting the stoplogs in the boundary flood wall against debris loads. The licensee assessed the structural adequacy of these barriers by comparing the reevaluated PMSS hydrostatic, hydrodynamic, and sedimentation loads with the barrier's allowable stresses. The barriers were determined to be structurally adequate but could be overtopped by wave loads and could be susceptible to sliding and overturning by debris loads. As stated in Table 2 of the FE, the licensee proposed installing a removable 4ft. concrete block barrier, capable of withstanding the reevaluated PMMS, at several stoplogs. This modification is tracked via condition report AR01977483-03.

- Flood barrier wall – this wall provides continuous flood protection perimeter around key SSCs. The licensee evaluated the wall's capacity to withstand the reevaluated PMSS hydrostatic, hydrodynamic, and sedimentation loads, as well as its ability to prevent water intrusion. As stated above, several segments of the north and south walls have the potential to experience water intrusion due to the 20-year sea level rise. Therefore, the licensee proposed to increase the height to above 17.7 ft. NAVD88 and reinforce these segments to account for wave-run-up considering the 20-year sea level rise and the reevaluated PMSS hydrostatic, hydrodynamic, and debris loading. In addition, the licensee stated that the concrete barriers are inspected in a yearly basis under inspection procedure PM 37141.

- Stoplogs – These flood protection features are placed at every access break in the boundary flood wall to prevent water ingress to the interior of the plant flood barrier. The licensee evaluated the structural adequacy of each stoplog and respective supports by comparing the reevaluated PMSS hydrostatic and hydrodynamic loads to the stoplog's allowable stresses. Based on this evaluation, several stoplogs needed to be modified to withstand the reevaluated PMSS. Specific stoplogs and their required modification was provided in Table 2 of the FE. These modifications are tracked via condition report AR01977483-03. In addition, the licensee stated that the stoplogs are inspected on a yearly basis under inspection procedure PM 37141.

- Drain Plugs – these flood protection features are used to prevent backflow of water into flood-protected areas during the PMSS event. The licensee evaluated the drain plugs by comparing the maximum back pressure imparted on the drain plug from the flood level to the back pressure rating corresponding to each drain plug. Based on this evaluation, the licensee proposed to replace one drain plug for a specific manhole as described in Table 2 of the FE. These modifications are tracked via condition report AR01977483-03. In addition, the licensee stated that the drain plugs are inspected on a yearly basis under inspection procedure PM 83395.

- Manholes, Conduits, Pipe penetrations – during the PMSS event water has the potential to enter the manhole system, conduits and pipe penetrations, and impact key SSCs. The licensee evaluated the potential sources of water ingress into the flood protection boundary. The licensee identified the unsealed manholes and conduits that could potentially contribute to water ingress and proposed installing flood seals that provide watertight defense against water ingress. These modifications are tracked via condition report AR01977483-03.

- Intake Structure – The intake structure flood wall was not design for waterborne projectile loads as part of its original design. The licensee assessed the wall's functionally during the PMSS event by evaluating its overall plastic capacity and comparing these stresses to the wall's allowable values. The licensee concluded that the wall would be capable to fulfill its intended function as a flood protection barrier for the PMSS event without any modification.

- Sandbags – The licensee plans to place sandbags around specific floor drains where drain plugs cannot be used. Procedures for the sandbag ring configuration were included in 0-ADM-116. The licensee has created condition report AR01977483-05 to ensure the sandbag configuration meets the guidance in NEI 16-05, Revision 1.

The staff reviewed the methodologies, assumptions, and input parameter values used to estimate the hydrostatic, hydrodynamic, and debris loads applied to the flood protection features and found these to be acceptable and reasonable. The NRC staff also reviewed the information provided by the licensee in FPL's report, NEE016-PR-001, Revision 1, which provides the calculations and engineering analysis used to evaluate the flood protection features described above. The staff noted that the licensee used engineering codes and standards in these calculations and evaluations in accordance with NEI 16-05, Revision 1. The NRC staff also reviewed the condition reports referenced above to ensure that the planned modifications are being properly documented and tracked for future implementation. If the modifications are completed as described by the licensee, the NRC staff concludes that the licensee has demonstrated that the flood protection features described above are reliable to maintain key safety functions, as described in Appendix B of NEI 16-05, Revision 1.

3.3.3 Overall Site Response

As previously explained, the licensee relies on permanent and temporary protection features to provide flood protection against the reevaluated PMSS event. Actions needed to deploy these temporary protection features were included as part of 0-ADM-116, "Hurricane Season Readiness Procedure. " This procedure outlines the actions to be taken prior to start of the hurricane season and 72 hours prior to the projected arrival of tropical-storm-force winds. The licensee stated that all actions needed for PMSS flood protection and mitigation are provided well in advance of hurricane arrival. Additionally, the licensee stated no manual actions are required during the PMSS, and therefore, expected environmental conditions are not applicable. Finally, the licensee stated that it used the guidance in NEI 16-05, Revision 1, Appendix C, to demonstrate adequate site response to the PMSS event.

Based on the licensee's FE description, as confirmed by the NRC staff's review of the licensee's procedure, O-ADM-116, the staff concludes that the licensee's site response evaluation has been performed in accordance with NEI 16-05, Revision 1, Appendix C, and is therefore acceptable.

3.4 Evaluation of Flood Impact Assessment for Probably Maximum Tsunami

3.4.1 Description of Impact of Unbounded Hazard

The licensee calculated the maximum water surface elevation for the Turkey Point site to be 14.8 ft. NAVD88, which remains below plant grade at 15.7 ft. NAVD88. Since the reevaluated PMT flood is lower than the site grade elevation, no impacts were identified to key SSCs.

3.4.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

Turkey Point relies on the passive protection of site topography and grading to provide protection from the PMT. The APM for the PMT was estimated at .9 ft. in relation to the site grade of 15.7 ft. NAVD88. The staff agrees with the licensee in that the APM is acceptable since the assumptions and input parameters used in the PMT analysis were conservative as described in NEI 16-05, Revision 1, Appendix B, Section B.1

Since the site's topography and grading are already credited as part of the Turkey Point's design-basis flood protection, the NRC staff concludes that a reliability analysis of these features is not necessary in accordance with the guidance found in NEI 16-05, Revision 1.

3.4.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the PMT flooding event. As described above, the licensee's evaluation relied on the site's topography and grading to demonstrate adequate flood protection. Therefore, there is no need to review overall site response for this mechanism.

3.5 Evaluation of Flood Parameters in the FE

3.5.1 Confirmation of the Flood Hazard Elevations in the FE

During the NRC staff's review of the Turkey Point FE, the staff noted that the licensee addressed each of the flood-causing mechanisms listed in Table 4.0-2 of the supplemental FHRR staff assessment (ADAMS Accession No. ML15301A200). The maximum flood elevations used by the licensee in its FE for the LIP Scenario A, seiche, and tsunami flood-causing mechanisms were the same as the reevaluated flood hazard elevations provided in Table 4.0-2 of the supplemental FHRR staff assessment. However, the staff notes that the supplemental FHRR staff assessment requested that the licensee address the seiche flood-causing mechanism in an integrated assessment. The NRC staff's review of LIP Scenario B and maximum storm surge flood-causing mechanisms in the FE revealed that the licensee used flood elevations different than those presented in Table 4.0-2 of the supplemental FHRR staff assessment. The licensee stated in its FE, that all flood-causing mechanisms listed in Table 4.0-2 of the supplemental FHRR staff assessment will be addressed by flood protection features.

LIP Scenario B Modifications

LIP Scenario B occurs when the plant is operating under hurricane readiness procedures. Analysis of LIP Scenario B is focused on the Units 3 and 4 Condenser Pits, Unit 3 CCW Area, and Unit 4 CCW Area. The FHRR supplemental staff assessment provides additional details regarding the NRC staff's assessment of the licensee's LIP Scenario B analysis.

The licensee stated in the FE that without any modifications to the flood protection strategy, the maximum flood elevation as a result of LIP Scenario B flood-causing mechanism would be 20.8 ft. NAVD88 and would occur in the CCW pump area of Unit 3. This is consistent with the reevaluated maximum flood elevations for LIP Scenario B presented in Table 4.0-2 of the supplemental FHRR staff assessment. In its FE, the licensee calculated that crediting two existing 300 gallons per minute (gpm) dewatering pumps in each CCW area would reduce the LIP flood-causing mechanisms maximum flood elevation to 16.6 ft. NAVD88. The 300-gpm pumps are included as part of the licensee's hurricane-season readiness procedure.

The licensee revised the FHRR FLO-2D Pro software Build No. 13.11.06 model to incorporate site-specific flood protection features and dewatering pumps. Flood protection features added include: flood barriers, kick plates/toe plates, condenser pits, roofs, decks, and open pathways. Kick plates/toe plates and barriers were incorporated as levee features in the revised model. Additionally, the licensee added 14 points of interest within the Units 3 and 4 Auxiliary and Turbine Building flood protection areas. The licensee performed an additional site walkdown to determine ground elevations around the turbine building and revised geological information system inputs to the model. Elevations on building decks were adjusted and levees incorporated in the revised model to account for building/structure runoff. The licensee credited condenser pump pits as additional storage. The licensee added a 500-gpm pump to Unit 3 and to Unit 4 CCW areas to simulate the four 300-gpm dewatering pumps included as part of the hurricane season readiness procedure. All other inputs and parameters and methodology used in the revised FLO-2D model were the same as those used for the FHRR analysis.

The NRC staff reviewed the details of the licensee's revised FLO-2D model and determined that the licensee's methodology and assumptions are reasonable. The model output files reviewed by NRC staff did not report any errors related to model stability or mass balance. The NRC staff also determined that the maximum flood elevation of 16.6 ft. NAVD88, as a result of the licensee's revised FLO-2D model, is reasonable.

Storm Surge Modifications

The supplemental FHRR staff assessment notes that the maximum storm surge considering wave runup and the effects of sea level rise is 19.1 ft. NAVD88 located on the eastern powerblock flood barrier. The existing eastern powerblock flood barrier is flood protected to 19.7 ft. NAVD88. Additionally, the NRC staff noted that the reevaluated maximum storm surge reaches an elevation of 18.0 ft. NAVD88 at the northern flood protection barrier, 17.5 ft. NAVD88 at the west flood protection barrier, and 17.9 ft. NAVD88 at the south flood protection walls. The flood protection elevation at the north, west, and south flood protection barriers is 17.7 ft. NAVD88. The maximum storm surge elevation reported in the supplemental FHRR staff assessment exceeds the flood protection elevation at the south barrier by 0.2 ft. and at the north barrier by 0.3 ft.

In its FE, the licensee revised the wind wave and wave runup calculations, originally provided in the FHRR, based on the U.S. Army Corps of Engineers (USACE) Coastal Engineering Manual

(USACE, 2011) to credit the northern barrier security wall and condensate storage tanks south of Unit 4 containment. The licensee states that these additions will prevent wave runup along the south and north flood protection barriers. Additionally, the licensee credits the barrier islands and independent spent fuel storage installation east of the Turkey Point site as limiting factors in wave runup.

The licensee-calculated maximum stillwater elevation for the storm surge flood-causing mechanism was 16.9 ft. NAVD88. The licensee did not use a 20-yr sea level rise as a component of the maximum storm surge for the revised margin calculations in the Turkey Point Units 3 and 4 FE. This assumption was justified by explaining conservatisms in other aspects of the storm surge calculation, such as the extremely low central pressure of the assumed hurricane while also assuming that the hurricane does not weaken as it approaches the shoreline. The 20-yr sea level rise component estimated by the licensee in the FHRR was 0.39 ft. The NRC staff notes that this component of maximum water height analysis is small compared to other, very conservative, assumptions in the licensee's FHRR analysis. The licensee states in its MSA, that they have committed to an action plan to address flood protection barrier height. All other flood protection features on the Turkey Point site were evaluated using the maximum storm surge with the 20-yr sea level rise incorporated. All other parameters the licensee used to calculate the maximum stillwater storm surge elevation are the same as those in the supplemental FHRR staff assessment. Using the revised wave runup values, the licensee calculated the maximum storm surge elevation for the east barrier as 18.2 ft. NAVD88, north barrier as 17.6 ft. NAVD88, south barrier as 17.5 ft. NAVD88, and west barrier as 17.1 ft. NAVD88.

The NRC staff compared the revised maximum storm surge values, without sea level rise, to the licensing basis protection elevation reported in FE Table 3.2-2 below. The NRC staff reviewed the licensee's calculations and determined that the methodology and parameters used to determine the maximum storm surge and wave runup was reasonable for the purposes of the FE.

Seiche

The supplemental FHRR staff assessment notes that the CDB was not defined for the seiche flood-causing mechanism. However, the NRC staff confirmed the licensee's conclusion that the reevaluated seiche flood hazard could not inundate the site. The licensee states in its FE, that key SSCs are not impacted by this flooding event. The licensee's conclusion is based on analysis provided in the FHRR. Based on the information provided in the supplemental FHRR staff assessment, the NRC staff agrees with the licensee that the reevaluated hazard for flooding from seiche alone could not impact the Turley Point site.

3.5.2 Evaluation of Flood Event Duration

The NRC staff reviewed the information provided in the FE regarding FED parameters for flood hazards not bounded by the CDB at Turkey Point. The FED parameters for the flood-causing mechanisms not bounded by the CDB are summarized in Table 3.2-3 of this assessment, except for seiche since that flooding mechanism could not inundate the site.

LIP Flood Event Duration

The NRC staff noted in the FHRR staff assessment that the licensee provided a single set of FED parameters for LIP Scenario A and Scenario B flood-causing mechanisms.

The NRC staff stated that different sets of FED parameters should generally be considered when addressing hazards from the different scenarios.

The licensee clarified in its FE that, with the addition of dewatering pumps in the CCW areas of Units 3 and 4 for LIP Scenario B, there is no appreciable difference between the two flood scenarios and that the FED parameters for each is bounded by LIP Scenario A. The licensee does not credit a warning time for LIP Scenario A, since only permanent and/or passive flood protection measures are relied on. The staff notes that this approach is consistent with guidance provided by Appendix G of NEI 12-06, Revision 2. The staff also notes the licensee has the option to use NEI 15-05 (ADAMS Accession No. ML15110A080) to estimate warning time (as needed) for further analyses. The licensee reported in the FE the periods of inundation of 30 minutes and the period of recession of 45 minutes for LIP Scenario A. The licensee used results from the revised FLO-2D model to determine these FED parameters as described in the FE.

The NRC staff notes that the FED parameters are the same as those previously reviewed in the supplemental FHRR staff assessment. In summary, based on NRC staff's review of FED parameters provided by the licensee, the staff determined that the licensee's FED parameters are reasonable.

Storm Surge Flood Event Duration

The NRC notes that the FED parameters in the FE are the same as those provided by the licensee in the supplemental FHRR staff assessment for the storm surge flood-causing mechanism. Based on NRC staff review of FED parameters provided by the licensee, the staff determined that the licensee's FED parameters are reasonable.

3.5.3 Evaluation of Flood Associated Effects

The NRC staff reviewed the information provided by FPL in the MSA and FE regarding AE parameters for flood hazards not bounded by the CDB at Turkey Point. The AE parameters for the flood-causing mechanisms not bounded by the CDB are summarized in Table 3.2-4 of this assessment, except for seiche since that flooding mechanism could not inundate site.

LIP Associated Effects

The NRC staff notes that the AE parameters provided by the licensee in its supplemental FHRR staff assessment are the same as those for the LIP flood-causing mechanism in the FE. The licensee stated in its MSA that hydrodynamic and hydrostatic loadings are negligible due to the low velocities and low water depths. Additionally, the licensee states that erosion and sedimentation are not expected due to the low velocities and paved surfaces. The staff confirmed small inundation depths and low water velocities from the revised LIP model output. Therefore, the staff agrees with the licensee's conclusion that the AE parameters for the LIP flood-causing mechanism are either minimal or not applicable to the safety-related plant structures.

Storm Surge Associated Effects

The NRC staff noted that in the FE no changes were made to the AE parameters provided by the licensee to those reported in the MSA for the storm surge flood-causing mechanism.

In its MSA, the licensee provides the hydrodynamic/debris loading, effects of sediment deposition, erosion, and concurrent site conditions. The NRC staff also notes that there were no significant changes of the AE parameters between the FHRR and the MSA.

The NRC staff review of the FHRR AE parameters associated with storm surge is documented in the FHRR staff assessment supplement. Since there are no significant changes from the FHRR to the FE, the staff concludes that the AE parameters in the FE are reasonable and acceptable for use.

4.0 AUDIT REPORT

The July 18, 2017(ADAMS Accession No. ML17192A452), generic audit plan describes the NRC staff's intention to issue an audit report that summarizes and documents the NRC's regulatory audit of the licensee's FE. The NRC staff's Turkey Point audit was limited to the review of the calculations and procedures described above. Because this staff assessment appropriately summarizes the results of the audit, the NRC staff concludes that a separate audit report is not necessary, and that this document serves as the audit report described in the staff's July 18, 2017, letter.

5.0 CONCLUSION

The NRC staff concludes that FPL performed the Turkey Point FE in accordance with the guidance described in NEI 16-05, Revision 1, as endorsed by JLD-ISG-2016-01, and that the licensee has demonstrated that effective flood protection will exist for the reevaluated flood hazards when the licensee completes its regulatory commitments to improve the plant's ability to withstand the postulated flood hazards. Furthermore, the NRC staff concludes that Turkey Point screens out of performing an integrated assessment based on the guidance found in JLD-ISG-2016-01. As such, in accordance with Phase 2 of the process outlined in the 50.54(f) letter, additional regulatory actions associated with the reevaluated flood hazard following completion of the licensee's regulatory commitments, are not warranted. The licensee has satisfactorily completed providing responses to the 50.54(f) activities associated with the reevaluated flood hazards.

Table 3.2-2. Comparison of FE Revised Maximum Storm Surge Elevations (without sea level rise) with Flood Protection Elevations

Area	Revised Maximum Storm Surge Elevations (without sea level rise)	Flood Protection Elevation	APM
East Barrier	18.2 ft. NAVD88	19.7 ft. NAVD88	1.5 ft.
North Barrier	17.6 ft. NAVD88	17.7 ft. NAVD88	0.1 ft.
South Barrier	17.5 ft. NAVD88	17.7 ft. NAVD88	0.2 ft.
West Barrier	17.1 ft. NAVD88	17.7 ft. NAVD88	0.6 ft.

Table 3.2-3. Flood Event Durations for Flood-Causing Mechanisms Not Bounded by the CDB.

Flood-Causing Mechanism	Time Available for Preparation for Flood Event	Duration of Inundation of Site	Time for Water to Recede from Site
Local Intense Precipitation and Associated Drainage			
Scenario A	Use NEI 15-05 (NEI, 2015)	0.5 hours	0.75 hours
Scenario B	48 hours(1), or Use NEI 15-05 (NEI, 2015)	0.5 hours	0.75 hours
PMSS	48 hours(1)	2 hours(2)	3 hours(3)
Tsunami	2 hours	Not Applicable	Not Applicable

Note 1: FPL's procedure, 0-ADM-116, "Hurricane Season Readiness Procedure," provides 72 hours of site flood preparation
Note 2: Stillwater value shown. Add an additional 1 hour to include wave runup
Note 3: Stillwater value shown. Add an additional 2 hour to include wave runup

Table 3.2-4. Associated Effects Inputs

	Flooding Mechanism				
Associated Effects Factor	**PMP/LIP**		**PMSS**	**PMT**	**Seiche**
	Scenario A	**Scenario B**			
Hydrodynamic loading at plant grade	Negligible	Negligible	375 lbs./ft.^{2}	None	None
Debris loading at plant grade	None	None	19,536 lbs. (8,861 kg)	Up to 65,300 lbs. (370 lb./in^2)(1)	None
Sediment loading at plant grade	None	None	Horizontal: up to 142 lbs./ft.^{2} (6.8 kPa) Vertical: up to 244 lbs./ft.^{2} (11.7 kPa)	None	None
Sediment deposition and erosion	None	None	Scour up to 2 ft. (0.61 m);	Deposition bounded by PMT runup elevation	None
Concurrent conditions, including adverse weather	None(2)	High winds (Kiley, 2014b RAI 10 response)	High winds High Intensity Rainfall	None	None
Groundwater ingress	None	None	None	None	None
Other pertinent factors (e.g., waterborne projectiles)	None	None	6,048 ft.-lb. (8199 N m) on intake structure	None	None

Note 1: PMT debris loading acts at maximum water level elevation, 12.1 ft. NAVD88, not plant grade.
Note 2: Applies to the time before the event and not during the event.

SUBJECT: TURKEY POINT NUCLEAR GENERATING, UNITS 3 AND 4 – STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION DATED JULY 3, 2018

DISTRIBUTION:
PUBLIC
PBMB R/F
RidsNRRDlp Resource
RidsNroDsea Resource
RidsNrrDorlLpl2-2Resource
RidsNrrDorl Resource
RidsNrrPMTurkeyPoint Resource
RidsOgcMailCenter Resource
RidsOpaMail Resource
RidsACRS_MailCtr Resource
RidsRgn2MailCenter Resource
RidsNrrLASLent
FVega, NRR
BTitus, NRR

ADAMS Accession No.: ML18158A548 ***via email**

OFFICE	NRR/DLP/PBMB/PM	NRR/DLP/PBMB/LA	NRR/DLP/PBMB/BC (A)	NRR/DLP/PBMB/PM
NAME	FVega	SLent	BTitus	FVega
DATE	06/28/2018	06/11/2018	07/03/2018	07/03/2018

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