NRR-PMDAPEm Resource

From: Klett, Audrey
Sent: Wednesday, January 15, 2014 1:25 PM
To: Tomonto, Bob (Bob.Tomonto@fpl.com); 'Hanek, Olga' (Olga.Hanek@fpl.com); 'Mihalakea, Stavroula' (Stavroula.Mihalakea@fpl.com)
Subject: Request for Additional Information - Turkey Point 3 & 4 - Flood Hazard Reevaluation Report (FHRR) - Recommendation 2.1 - Flooding (TACs MF1114/15)

Hi Bob, Olga, Stavy,

By letter dated March 11, 2013, Florida Power & Light Company (the licensee) provided its reevaluated flood hazard report for the Turkey Point Nuclear Generating Unit Nos. 3 and 4 in response to Enclosure 2 of the March 12, 2012, Fukushima Lessons-Learned 50.54(f) letter. To complete its review, the NRC staff requests the licensee to provide the following additional information. The NRC staff is requesting the licensee to respond to requests for information (RAIs) 1 through 9 by January 31, 2014, and RAIs 10 and 11 by February 28, 2014. Stavy Mihalakea of the licensee's staff confirmed these due dates on January 15, 2014.

REQUEST FOR ADDITIONAL INFORMATION (RAI)

RAI 1. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The licensee's analysis of local intense precipitation (LIP) from the 1-hour probable maximum precipitation (PMP) event uses a center-loaded distribution for this event. In order to demonstrate the suitability of the method and level of conservatism, the NRC staff requests the licensee to provide a description of the basis for selecting a center-loaded temporal rainfall distribution for analysis of the one-hour probable maximum precipitation (PMP) event. The NRC staff also requests the licensee to describe whether the analysis of this rainfall distribution is bounding for the effects of PMP-induced flooding at the site.

RAI 2. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The NRC staff's review of the local intense precipitation (LIP) flooding results submitted by the licensee indicates that the FLO-2D model terminated early with errors in mass balance. The NRC staff also observed that FLO-2D's volume conservation and mass balance calculations included in output files BASE.OUT and SUMMARY.OUT show very large mass balance discrepancies and indicate that the model run simulated only the first 17 minutes of the one-hour PMP event. Since the modeling error is significant and can affect the results, the NRC staff requests the licensee to submit a revised flooding analysis which includes a revised analysis for LIP Scenario A or provide a justification to demonstrate the acceptability of the FLO-2D model results for LIP Scenario A.

RAI 3. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The NRC staff's review of the local intense precipitation (LIP) flooding hazard analysis around the powerblock area indicates a need for additional descriptions in order to demonstrate the appropriateness of the modeling approach used for determining the localized water levels and flow velocities from the PMP event. For LIP Scenario A, the FLO-2D numerical model was used to simulate the flow of runoff at the powerblock and its surrounding areas. The NRC staff requests the licensee to provide justification to demonstrate the structure and scale of this model application is appropriate for simulating flow within spaces between buildings and structures with sufficient accuracy and spatial resolution in order to predict water levels and velocities at specific doorways and other critical locations within the power block.

RAI 4. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The model documentation for the FLO-2D flood analysis indicates that areas occupied by buildings were treated as no-flow zones in modeling onsite hydraulics, but it does not indicate how the model handled

precipitation onto these zones. The NRC staff requests the licensee to describe how precipitation that falls on building roofs would be routed to the ground surface during a flood event, and how the routing of this precipitation is handled in modeling of Scenario A.

RAI 5. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The NRC staff requests additional information to complete its review the modeling of the local intense precipitation Scenario A using FLO-2D. Specifically, the Condenser Pits and Component Cooling Water (CCW) are not discernible as low-elevation areas in the files provided to document model input, nor are they discernible as sites of significant water accumulation in the model output files or on the images (maps) provided to illustrate model results. The NRC staff requests the licensee to provide a description of how the Condenser Pits and CCW Areas for Units 3 and 4 are represented in the FLO-2D model.

RAI 6. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The NRC staff requests additional information to complete its review of the tabulated maximum predicted water elevations, depths, and flow velocities at 33 discrete points of interest, which the licensee identifies as potentially vulnerable areas. The NRC staff requests the licensee to provide a diagram or site plan that identifies/labels the facilities or buildings associated with the 33 locations for which flow depths and elevations are calculated for local intense precipitation Scenario A (see Table 4-2 of the FHRR). The NRC staff also requests the licensee to provide the critical elevations (and/or heights above local grade) for both the possible points of water entry and the safety-related systems, structures, and components (SSCs) associated with these 33 locations.

RAI 7. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The discussion provided in the FHRR for local intense precipitation (LIP) Scenario A, presented on page 71 indicates that flood water could enter the non-watertight east doors of the Auxiliary Building and that there are three motor control centers (MCCs) “several feet” west of the doors. The FHRR states that these MCCs would not be affected by flooding because they are mounted on curbs that elevate them 5 inches above the floor and because water would flow down to lower levels of the building. Since the qualitative description does not explain the volume of water coming through the depth of accumulation inside the room, the NRC staff requests the licensee to provide quantitative information in support of this conclusion.

RAI 8. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

The NRC staff requests additional information to complete its review of the local intense precipitation flood hazard at the Component Cooling Water (CCW) structures 3 and 4. The NRC staff requests the licensee to provide the critical elevations of the safety-related SSCs associated with CCW3, CCW4 and the Condenser Pits.

RAI 9. Section 3.2 Local Intense Precipitation and Associated Site Drainage:

In order to clarify the licensee’s conclusions regarding the potential for water to accumulate from local intense precipitation (LIP), the NRC staff requests the licensee to describe why the projected accumulation of water in the Turbine Building, Condenser Pits, and Component Cooling Water (CCW) areas under LIP Scenario A do not require the same types of additional actions as are indicated for accumulations in these areas under LIP Scenario B. In particular, the NRC staff requests the licensee to explain the statement in FHRR Section 5.1.2 that indicates that the LIP event Scenario B is “of a much longer duration than Scenario A and some external flooding may add to the accumulation.” Since both LIP scenarios are based on the same one-hour PMP event, the NRC staff requests the licensee to provide additional clarification regarding the “much longer duration” referred to for scenario B. The NRC staff also requests the licensee to clarify what the licensee regards as “external flooding” in this context.

RAI 10. Section 4.0 Integrated Assessment:

The March 12, 2012, 50.54(f) letter, Enclosure 2, requests the licensee to perform an integrated assessment of the plant's response to the reevaluated hazard if the reevaluated flood hazard is not bounded by the current design basis. The NRC staff requests the licensee to provide the applicable flood event duration parameters (see definition and Figure 6 of the Guidance for Performing an Integrated Assessment, JLD-ISG-2012-05) associated with mechanisms that trigger an Integrated Assessment. This includes (as applicable) the warning time the site will have to prepare for the event, the period of time the site is inundated, and the period of time necessary for water to recede off the site for the mechanisms that are not bounded by the current design basis. The NRC staff also requests the licensee to provide a basis for the flood event duration parameters. The basis for warning time may include information from relevant forecasting methods (e.g., products from local, regional, or national weather forecasting centers).

RAI 11. Section 4.0 Integrated Assessment

The March 12, 2012, 50.54(f) letter, Enclosure 2, requests the licensee to perform an integrated assessment of the plant's response to the reevaluated hazard if the reevaluated flood hazard is not bounded by the current design basis. The NRC staff requests the licensee to provide the flood height and associated effects (as defined in Section 9 of JLD-ISG-2012-05) that are not described in the flood hazard reevaluation report for mechanisms that trigger an Integrated Assessment. This includes the following quantified information for each mechanism (as applicable):

- Hydrodynamic loading, including debris,
- Effects caused by sediment deposition and erosion (e.g., flow velocities, scour),
- Concurrent site conditions, including adverse weather,
- Groundwater ingress, and
- Other pertinent factors (e.g., waterborne projectiles).

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