

**Florida Commission on Hurricane Loss Projection Methodology**  
**2017 Hurricane Standards**  
**Florida Public Hurricane Loss Model**  
**Florida International University**  
**Professional Team On-Site Review: February 18-20, 2019**

The purpose of the pre-visit letter is to outline specific issues unique to the modeler's submission, and to identify lines of inquiry to be followed during the on-site review to allow adequate preparation by the modeler. Aside from due diligence with respect to the full submission, various questions that the Professional Team is certain to ask the modeler during the on-site review are provided in this letter. This letter does not preclude the Professional Team from asking for additional information during the on-site review that is not given below or discussed during an upcoming conference call that will be held if requested by the modeler. One goal of the potential conference call is to address modeler questions related to this letter or other matters pertaining to the on-site review. The overall intent is to expedite the on-site review and to avoid last minute preparations that could have been undertaken earlier.

Some of this material may have been shown or may have been available on a previous visit by the Professional Team. The Professional Team will also be considering material in response to deficiencies and issues designated by the Florida Commission on Hurricane Loss Projection Methodology (Commission) during the January 7, 2019 conference call meeting.

It is important that all material prepared for presentation during the on-site review be presented using a medium that is readable by all members of the Professional Team simultaneously.

The on-site schedule is tentatively planned to proceed in the following sequence: (1) presentation by the modeler of new or extensively updated material related to the model; (2) section by section review commencing within each section with pre-visit letter responses; (3) responses to new or significantly changed hurricane standards in the *2017 Hurricane Standards Report of Activities*, and (4) responses to the audit items for each hurricane standard in the *2017 Hurricane Standards Report of Activities*.

If changes have been made in any part of the model or the modeling process from the descriptions provided in the original 2017 submission, provide the Professional Team with a complete and detailed description of those changes, the reasons for the changes (e.g., an error was discovered), and all revised forms where any output changed. For each revised form, provide an additional form with cell-by-cell differences between the revised and originally submitted values.

Refer to the On-Site Review section of the *Hurricane Standards Report of Activities as of November 1, 2017* for more details on materials to be presented to the Professional Team. Particular attention should be paid to the requirements under Presentation of Materials on pages 80-81. These requirements are reproduced at the conclusion of this letter.

For your information, the Professional Team will arrive in business casual attire.

The pre-visit comments are grouped by hurricane standards sections.

## **GENERAL STANDARDS:**

1. Describe the process used to prepare the 2017 FHCF personal and commercial residential zero deductible exposure data to produce the various forms which use it. Indicate the problematic entries requiring further investigation.
2. G-1, Disclosure 5.B, page 103: Reconcile the impact of all model changes with Form S-5 (page 176).
3. G-1, Disclosure 5, page 105: Discuss the variations of impact on county level loss costs due to HURDAT2 updates in Figure 20. Provide the driving forces for the changes in Clay, Hendry, Holmes, and Volusia Counties.
4. G-1, Disclosure 5, page 106: Discuss the variations of impact on county level loss costs due to ZIP Code Centroid updates in Figure 21. Explain no changes in Baker, Columbia, DeSoto, Seminole, Suwannee, and Wakulla Counties.
5. G-3, page 116: Present geographic representations of the previous versus current ZIP Code centroids.
6. G-3, Disclosure 3, page 117: Explain the tool used to convert street address to latitude and longitude and the methodology for assigning ZIP Codes.
7. G-3, Disclosure 5, page 117: Provide the number of ZIP Codes used in the various forms. Provide a list of all new and retired ZIP Codes relative to the previous submission.

## **METEOROLOGICAL STANDARDS:**

8. M-5, Disclosure 3, pages 139-140: Discuss the surface-wind coastal transition function using the internal boundary layer. Elaborate on the duration over which this transition occurs.
9. Form M-1, pages 542-543: Reconcile the historical Florida Cat-4 landfalls as listed in Form M-1 and Form A-2A Base Hurricane Storm Set.
10. Form M-1, pages 542-543: Explain the classification for NoName02 (1919) in Form M-1 and Forms A-2A and A-2B.
11. Form M-2, pages 545-548: Ensure that open-terrain roughness length was applied only over land. If not, provide the Form M-2 maps with open-terrain applied only on land points.

## **STATISTICAL STANDARDS:**

12. S-1, Disclosure 4, page 156: Explain the change in the Estimated Loss Level relative to the previous submission. Explain the narrowness of the uncertainty bounds.
13. S-5, Disclosure 1, pages 166-167: Explain no change in Table 16 results relative to the previous submission.

14. Form S-3, page 562: Indicate the forms and output calculations that were impacted by the more extensive HURDAT2 data through 2017 being used.
15. Form S-4, page 564: Discuss the apparent bias in the results from these comparisons as a whole (i.e., modeled results tend to be greater than historical results).

#### **VULNERABILITY STANDARDS:**

16. V-1.D, page 186 and Disclosures 6 and 7, pages 218-220: Provide research, if any, with regards to Florida Building Code 2014 and Florida Building Code 2017, conclusions drawn, and the impact on the current model.
17. V-1.D, page 186 and Disclosures 6 and 7, pages 218-220: Present the databases and comment on wind-borne debris region and high velocity hurricane zone implemented in the current model per Florida Building Code 2010 and their applicability to residential buildings constructed after Florida Building Codes 2014 and 2017.
18. V-1, Disclosure 3, pages 192-215: Explain how exposures with no claims are incorporated in the data and how the premium files were used in developing vulnerability functions.
19. Form V-3, Disclosure 7, pages 249-252: Provide, in Excel, the data (mean and +/- one standard deviation at the given windspeeds) in Figures 62-65.
20. Form V-1, pages 571-576: Explain how Form V-1 was completed with respect to the current model.
21. Form V-2, pages 577-578: Explain how Form V-2 was completed with respect to the current model.
22. Form V-4, page 580: Explain the "0" entries for Roof Covering ASTM D7158 Class H Shingles.

#### **ACTUARIAL STANDARDS:**

23. A-1, page 268: Explain how the input and output forms demonstrate that there is no requested or implemented, respectively, storm surge, storm frequency adjustment, or capability of the user to alter the meteorology, vulnerability, or actuarial components with reference to storm surge or storm frequency. (Commissioner Robert Lee review item)
24. A-1, Disclosure 4, page 270: Explain what difference in loss costs may result from choosing Actual Cash Value or Replacement Cost.
25. A-1, Disclosures 7 and 8, page 280: Quantify the difference in model output that may result from changing the order of input or removing/adding policies.
26. A-2.B, page 281: Provide a hard copy of the documented procedure.

27. A-3, Disclosures 1-4, pages 282-285: Show a calculation of loss costs and probable maximum loss levels for the minimum Manufactured Home loss costs in Form A-1 (i.e., ZIP Code 32096 in Hamilton County).
28. A-4, Disclosure 1, page 287: Provide, in Excel, tables of 1,000 years descending from the Top Event corresponding to Forms A-8A and A-8B. For each year, show the value of each hurricane separately.
29. A-5, Disclosure 3, page 293: Explain the calculation of Insurance Hurricane Loss.
30. A-6, Disclosure 18, page 299: Reconcile percentage change with overall changes quoted on page 103 and page 176.
31. A-6, Disclosure 19, page 299: Explain how the model would handle two examples for a commercial residential property with a \$1 million value:
  - a. 80% coinsurance clause with \$600,000 policy limit
  - b. First loss policy with \$500,000 policy limitInclude discussion of the inputs to the system.
32. Form A-1, pages 359-361: Explain the large changes in ZIP Codes 33630, 33945, and 32240.
33. Forms A-3A and A-3B, pages 373-407: Explain the significant increases in totals for Hurricane Charley (2004) and Hurricane Jeanne (2004) and the small decrease in Hurricane Ivan (2004) going from A-3A to A-3B.
34. Form A-3A, pages 373-389: Explain the changes for Hurricane Charley (2004) in ZIP Codes 34266 and 34269 relative to the previous submission.
35. Forms A-4A and A-4B, pages 409-449: Explain the weighting procedure used to determine the county averages for DeSoto and Gulf Counties.
36. Forms A-4A and A-4B, pages 409-449: Explain the process used to identify apparent anomalies and to determine the reasons for the apparent anomaly. Also refer to page 357.
37. Form A-4B, 0% Deductible, pages 430-439: Explain, in general, how the apparent anomalies in the shaded areas were resolved. In particular, explain the following cases for Frame loss costs less than Masonry loss costs:
  - Owners: Alachua Low, Franklin Low, Seminole Low
  - Renters: Calhoun Low, Wakulla High
  - Condo Unit: Charlotte Low, Okaloosa Low
38. Form A-4B, pages 430-449: Explain, in general, how the ordering of Frame loss costs versus Masonry loss costs can reverse for 0% Deductible and Specified Deductible. In particular, consider:
  - Owners Frame and Masonry, Clay Low
  - Owners Frame and Masonry, Lafayette Low
  - Condo Unit Frame and Masonry, Santa Rosa Low

39. Form A-4B, page 442: With Form A-1 having only two ZIP Codes for Glades County (33471 and 33944), explain the values given in Form A-4B for Glades County Low, Average, and High for Frame Owners, Masonry Owners, and Manufactured Homes.
40. Form A-4B, page 443: With Form A-1 having only two ZIP Codes for Gulf County (32456 and 32465), explain the values given in Form A-4B for Gulf County Low, Average, and High for Frame Owners, Masonry Owners, and Manufactured Homes.
41. Form A-5, page 451: Explain the increase in North for Frame Renters for \$0 Deductible Output Ranges and the decrease in North for Frame Renters for Specified Deductible Output Ranges.
42. Forms A-8A and A-8B, pages 520-528: Explain the categorization of the data between Contents and Buildings for Condo Unit Owners and Renters.
43. Forms A-8A and A-8B, pages 520-528: Reconcile the total number of hurricanes in Form A-8A and Form A-8B.

#### **COMPUTER/INFORMATION STANDARDS:**

44. CI-1.B, page 339: Relate the primary binder table of contents with the response to Standard G-1, Disclosure 5 (pages 103-107) by demonstrating individual table item compliance with Computer/Information Standards CI-1 through CI-7.
45. CI-1.D, page 340: Provide the table required by Standard CI-1, Audit Item 7.
46. CI-1.F, page 340: Provide the list of all externally acquired hurricane model-specific software and data assets required by Standard CI-1, Audit Item 6.
47. CI-2, page 341: Provide requirements documentation that specifically relates to each model change identified in Standard G-1, Disclosure 5 (pages 103-107).
48. CI-3.B, page 342: Provide the types of Unified Modeling Language diagrams used.
49. CI-5, pages 345-347: Provide complete and thorough verification procedures and output from the model changes identified in Standard G-1, Disclosure 5 (pages 103-107).
50. CI-6.D, page 348: Provide the model version history over the past 5 years, leading up to the version identified in the submission.

#### **Editorial Items:**

The following editorial items are noted for correction prior to the Professional Team's arrival in order to facilitate efficiency during the on-site review and to avoid last minute edits. The list is not intended to be all-inclusive, does not guarantee that all editorial difficulties have been identified, and does not preclude the Professional Team from noting additional editorial items during the audit.

1. Page 97, G-1, Disclosure 4 – Computer Science Standards should be updated to Computer/Information Science Standards.
2. Page 103, G-1, Disclosure 5.B – Disclosure wording not updated.
3. Page 105, G-1, Disclosure 5.C – Figure 20 incorrect reference to HURDAT.
4. Page 298, A-6, Disclosure 17 – The reference to Form A-4 should be Forms A-4A and A-4B.
5. Page 299, A-6, Disclosure 18 – Incorrect references to HURDAT.
6. Pages 311-315, Form A-3B – Map titles should be A3B.
7. Page 556, Form S-1 – Historical Probability for 10 or more incorrect.
8. Page 568, Form S-4 – Figure 112 heading is incomplete.

**Excerpt from the 2017 Hurricane Standards Report of Activities, pages 80-81:**

**Presentation of Materials:** The modeling organization shall have all necessary materials and data on-site for review. All material referenced in the hurricane model submission as “will be shown to the Professional Team” and all material that the modeling organization intends to present to the Commission, including trade secret items, shall be presented to the Professional Team during the on-site review.

The modeling organization shall provide upon arrival of the Professional Team, and **before the review can officially commence**, six printed copies of:

1. The modeling organization’s presentations,
2. The tables required in CI-1, Hurricane Model Documentation, Audit 6,
3. All figures with scales for the  $x$ - and  $y$ -axes labeled that are not so labeled in the hurricane model submission. The figures should be labeled with the same figure number as given in the hurricane model submission,
4. Form V-3, Hurricane Mitigation Measures, Mean Damage Ratios and Hurricane Loss Costs (Trade Secret Item),
5. Form V-5, Differences in Hurricane Mitigation Measures and Secondary Characteristics, Mean Damage Ratios and Hurricane Loss Costs (Trade Secret Item), and
6. Form A-6, Logical Relationship to Hurricane Risk (Trade Secret Item), (all eight worksheets), color-coded contour map of the hurricane loss costs for strong owners frame buildings (Notional Set 6), scatter plot of the hurricane loss costs ( $y$ -axis) against distance to closest coast ( $x$ -axis) for strong owners frame buildings (Notional Set 6).

The modeling organization shall also provide upon arrival of the Professional Team, and **before the review can officially commence**, electronic spreadsheets of all forms where no cell contains an explicitly rounded or truncated value. The electronic files shall be provided on six removable drives. The Professional Team will review and process the electronic files only on the removable drives.

The Professional Team will review selected computer/information components in conjunction with the review of various hurricane standards. Computer/information components shall be readily

available and reviewable interactively allowing simultaneous visualization by all Professional Team members.

Access to critical articles or materials referenced in the hurricane model submission or during the on-site review shall be available on-site in hard copy or electronic form for the Professional Team.

The Professional Team shall be provided access to internet connections through the Professional Team members' personal computers for reference work that may be required during the on-site review.

The modeling organization should be prepared to have available for the Professional Team's consideration, all insurance claims data received or newly processed since the previous hurricane model submission, and be prepared to describe any processes used to amend or validate the hurricane model that incorporates this data.

The modeling organization should be prepared to provide for the Professional Team's review, all engineering data (e.g., post-event site investigations, laboratory or field testing results) received since the previous review by the Professional Team, and be prepared to describe any processes used to amend or validate the hurricane model that incorporates this data.