Deficiencies in Modeler Submissions
2017 Hurricane Standards

Prepared by the Professional Team for the
Florida Commission on Hurricane Loss Projection Methodology

December 28, 2018

The Professional Team held conference calls on December 19-21, 2018, to discuss the model submissions received by November 8, 2018, for review and determination of acceptability under the 2017 Hurricane Standards. The following items are submitted to the Commission as potential deficiencies to be discussed at the January 7, 2019, Commission conference call meeting. The Professional Team does not deem it necessary for any of the pre-existing modeling organizations to submit Form S-6.

The Professional Team will issue a pre-visit letter with specific requests for material in addition to that specified in the 2017 *Hurricane Standards Report of Activities*.

AIR Worldwide Corporation – AIR Hurricane Model for the United States, V17.0.0, Touchstone® V6.1.0

1. Standard M-5, Disclosure 2 (page 89)
   Non-responsive as the disclosure requires windspeed, not central pressure, as given in Figure 14.

2. Form M-1 (Appendix 2, pages 231-237)
   Non-responsive as the modifications to AIR's Base Hurricane Storm Set used in completing Form M-1 are not according to the description given on page 231. Form M-1 does not include by-passing hurricanes as listed in AIR's Base Hurricane Storm Set and given in Forms A-2A and A-2B.

3. Form M-3 (Appendix 2, pages 244-246)
   Non-responsive as values are missing at 900mb for outer radii and Table 30 values are inconsistent with Figure 57.

4. Form S-4 (Appendix 3, page 257)
   Incomplete as the specification for which type of exposure data used is not given.

5. Standard V-1.D (page 122)
   Non-responsive as the year-built adjustment to account for structural aging is not according to the description given in Disclosure 1 (page 124).

6. Standard A-1, Disclosures 4 & 5 (pages 148-154)
   Incomplete as the "hurricane model name and version identification" is not included on the input form and the hurricane model output report as required.

Applied Research Associates, Inc. – HurLoss Florida Model Version 9.0

1. Standard G-1, Disclosure 5.C (Pages 28 and 30)
   Non-responsive as the maps in Figures 3 and 7 do not contain a minimum of seven intervals as required in the Acceptability Process II.A.4.e.2, page 52 of the 2017 *Hurricane Standards Report of Activities*.

2. Standard G-2, Disclosure 2.B (page 38)
   Non-responsive as Dr. Shujun Li, who started in 2017, is not listed as a new employee or consultant.

3. Standard G-3.C (page 41)
   Non-responsive as to whether the ZIP Code information has been verified for accuracy and appropriateness.

4. Form S-4.C (Appendix A, page 180)
   Non-responsive as the Comparison 2 plot in Figure 52, Part A is incorrect with only 2 of 3 points plotted.

5. Form S-4.C (Appendix A, page 181)
   Non-responsive as the two plots in Figure 52, Part B are incorrect as the values plotted are inconsistent with the table values given on page 179.

6. Standard V-1.A (page 83)
   Non-responsive as to "Any development of the building hurricane vulnerability functions based on rational structural analysis, post-event site investigations, and laboratory or field testing shall be supported by historical data."

7. Standard V-1, Disclosure 6 (pages 86-87)
   Incomplete as "descriptions of the building types and characteristics, building height, number of stories, regions within the state of Florida, year of construction, and occupancy types for which a unique building hurricane vulnerability function is used" is not given.

   Unclear as the number of regions within the state of Florida listed is inconsistent with the number of regions given in response to Standard V-1.C on page 84.

8. Standard V-1, Disclosure 9.d (page 88)
   Incomplete as the "assumptions, data, methods, and processes used to develop building hurricane vulnerability functions for when building input characteristics are conflicting" is not given.

9. Standard V-2.A (page 89)
   Non-responsive as to "Any development of the contents and time element hurricane vulnerability functions based on rational structural analysis, post-event site investigations, and tests shall be supported by historical data."

10. Standard V-3.C (page 95)
    Non-responsive as no response is given.

Applied Research Associates, Inc. – HurLoss Florida Model Version 9.0 (continued)

11. Standard A-1, Disclosure 4 (pages 98-101)
    Incomplete as the "hurricane model name and version identification" is not included on the input form as required.

12. Standard A-2.B (page 105)
    Non-responsive as "a documented procedure for distinguishing wind-related hurricane losses from other peril losses" is not indicated.

13. Forms A-4A.C and D and A-4B.C and D (Appendix A, pages 240 and 251)
    Non-responsive as a list of ZIP Codes for which there are hurricane loss costs but no exposure or a list of ZIP Codes for which there are no hurricane loss costs but there is exposure are not given or addressed.

CoreLogic, Inc. – CoreLogic Florida Hurricane Model 2019, Risk Quantification and Engineering

1. Standard G-1, Disclosure 4 (pages 29-30)
   Incomplete as the Florida Building Code 2014 and 2017 references cited in the submission are not given in the Vulnerability Standards reference list.

2. Standard G-3, Disclosure 5 (page 47)
   Non-responsive as a description of the process for updating year of construction and wind-borne debris ZIP Code-based databases is not given.

3. Standard G-5 (page 49)
   Incomplete as the submission document does not reflect the current wording in the 2017 *Hurricane Standards Report of Activities* including, but not limited to, Standard G-1.A and C, Disclosures 2 and 6.

4. Standard M-2, Disclosure 9 (page 56)
   Non-responsive as Form M-1 does not provide the hurricane frequency distribution by intensity for each segment.

5. Standard M-4, Disclosure 6 (page 62)
   Incomplete as the "recent meteorological references" are not given.

6. Standard S-1, Disclosure 6 (page 72)
   Incomplete as a goodness-of-fit test for intensity and a goodness-of-fit test for physical damage are not given.

7. Standard V-1, Disclosure 1 (page 85)
   Unclear as the statement, "The building vulnerability component in the hurricane model has not been updated from the previously-accepted hurricane model" is inconsistent with the response given to Standard G-1, Disclosure 5 on page 31 addressing vulnerability component updates.

CoreLogic, Inc. – CoreLogic Florida Hurricane Model 2019, Risk Quantification and Engineering (continued)

8. Standard V-3, Disclosure 1 (page 103)
   Unclear as the statement, "The hurricane mitigation measures and secondary characteristics have not been modified since the previously-accepted hurricane model" is inconsistent with the response given to Standard G-1, Disclosure 5 on page 31 addressing vulnerability component updates.

9. Standard A-1.B (page 113)
   Non-responsive as the treatment of missing values for user inputs being actuarially sound is not given.

10. Standard A-1, Disclosures 4 & 5 (pages 115-122)
    Incomplete as the "hurricane model name and version identification" is not included on the input form and the hurricane model output report as required.

Florida International University – Florida Public Hurricane Loss Model V6.3

1. Standard G-1, Disclosure 4 (pages 76-96)
   Incomplete as the South Florida Building Code 1961 and 1994 references cited in the submission are not given in the Vulnerability Standards reference list.

2. Standard G-3, Disclosure 5 (page 117)
   Non-responsive as a description of the process for updating wind-borne debris and roughness ZIP Code-based databases is not given.

3. Standard V-1.E (page 186)
   Incomplete regarding hurricane vulnerability functions.

4. Forms A-4A.C and D (Appendix G, page 408) and A-4B.C and D (Appendix H, page 429)
   Non-responsive as a list of ZIP Codes for which there are hurricane loss costs but no exposure or a list of ZIP Codes for which there are no hurricane loss costs but there is exposure are not given or addressed.

Karen Clark & Company – KCC US Hurricane Reference Model 2.0, RiskInsight®4.9 Build 181104:0500

1. Standard G-1, Disclosure 4 (pages 27-34)
   Incomplete as the National Land Cover Database 2011 and the ATC Code references cited in the submission are not given in the Vulnerability Standards reference list, and the ISO 5807 reference cited in the submission is not given in the Computer Information Standards reference list.

   The acronym ATC is not included in the list of acronyms in Appendix G (pages 332-333).

Karen Clark & Company – KCC US Hurricane Reference Model 2.0, RiskInsight®4.9 Build 181104:0500 (continued)

2. Standard G-2, Disclosure 2.A (page 39)
   Incomplete as the names of Karen Clark, Katelynn Larson, and James Michael Grayson are missing from Table 1.

3. Standard G-3, Disclosure 4 (page 48)
   Incomplete as a database for vulnerability regions as listed under Standard G-3.D is not given.

4. Standard S-1, Disclosure 6 (page 74)
   Unclear as Figure 22 is Mean Damage Ratio but the axes are windspeeds.

5. Standard S-4, Disclosure 1 (page 81)
   Incomplete as how the required performance is achieved is not given.

6. Form S-3 (page 169)
   Incomplete as none of the functional forms are complete and landfall frequencies is not included as a stochastic hurricane parameter.

7. Standard V-1, Disclosure 3 (page 91)
   Incomplete as the number of policies and the number of units of dollar exposure separated into personal residential, commercial residential, and manufactured homes are not given.

8. Standard A-1, Disclosures 4 & 5 (pages 111-116)
   Incomplete as the "hurricane model name and version identification" is not included on the input form and the hurricane model output report as required.

Risk Management Solutions, Inc. – North Atlantic Hurricane Models, RiskLink® 18.1 (Build 1945)

1. Standard V-1.A (page 106)
   Non-responsive as to "Any development of the building hurricane vulnerability functions based on rational structural analysis, post-event site investigations, and laboratory or field testing shall be supported by historical data."

2. Standard V-1, Disclosure 8 (page 114)
   Non-responsive as "the relationship between building structure and appurtenant structure hurricane vulnerability functions and their consistency with insurance claims data" is not given.