

LINDA LINGLE  
GOVERNOR

JAMES R. AIONA, JR.  
LT. GOVERNOR



MARK E. RECKTENWALD  
DIRECTOR

J. P. SCHMIDT  
INSURANCE COMMISSIONER

STATE OF HAWAII  
INSURANCE DIVISION  
DEPARTMENT OF COMMERCE & CONSUMER AFFAIRS  
P. O. BOX 3614  
HONOLULU, HAWAII 96811-3614  
250 S. KING ST., 5<sup>TH</sup> FLOOR  
HONOLULU, HAWAII 96813

July 30, 2003

**Memorandum 2003-3R**

**TO:** All Licensed Insurers Offering Property Insurance in Hawaii

**VIA:** Licensed Rating Organizations for Property Insurance

**FROM:** J.P. Schmidt  
Insurance Commissioner

**RE:** Models for Hurricane Exposure in Hawaii

The purpose of this memorandum is to provide guidance on supplemental rate filing requirements for property insurance and supercedes memorandum 2001-9A dated July 12, 2001.

Be advised that the Insurance Division will be reviewing the appropriateness of catastrophe models for hurricane exposure in Hawaii. As such, rate filings submitted to the Division will not be deemed complete nor filed unless the specific model used has been reviewed by the Division. An insurer's rate filing must identify the model and specific version that is used in the filing. The insurer must provide a copy of the modeler's output form depicting information provided by the insurer in the running of the model. The filing insurer must provide an output form depicting any adjustments or modifications made by the insurer to the model output loss costs.

An insurer's filing based on a new/revised model should be accompanied by modelers' responses to the following items submitted in a manner that can be reviewed by the Hawaii Insurance Division staff and their consultants (visual resolution, chart labeling, definitions, etc). Modelers are requested to comply with the Florida Commission on Hurricane Loss Projection Methodology's visual presentation of data requirements whenever applicable in responding to these issues.

1. Provide the names of the modeler's technical staff and consultants along with their educational background, experience with hurricane modeling for ratemaking, and professional affiliations along with a description of their role in the development or revisions of the model.
2. Is the model the same as that which has been accepted by the Florida Commission on Hurricane Loss Projection Methodologies (FCHLPM)? If not, please describe the differences between the Hawaii model and that which has been accepted by the FCHLPM.

3. Describe how the model defines “hurricane” and describe how that definition compares with the insurance policy definition of “hurricane” used in Hawaii.
4. The filing insurer must provide specific details as to information provided by the filer for the model run that produces the filed loss costs (i.e., exposures, deductibles, policy provisions, construction classifications etc.). The modeler must provide a copy of the output report provided by the modeler.
5. The filing insurer must provide specific details as to any adjustments or modifications from the model output loss costs to the loss costs filed with the Hawaii Insurance Division. The modeler must provide a copy of an output form describing these adjustments or modifications.
6. Provide an overview of how the model works. For example, if coastlines are divided into segments, describe segment widths. Describe level of geographic detail of model calculations (i.e., latitude/longitude or zip code . . .)
7. Provide detailed description of the historical storms used in developing the stochastic storms used to run the model. Specifically provide details of the impact of each of the following criteria on the creation of the stochastic storm set:
  - a. Hurricanes and/or tropical storms (describe wind speeds in historical storms used by the model.)
  - b. Pacific vs. Atlantic hurricanes
  - c. Historical time period of data available and used in creation of the model used in Hawaii
  - d. Pacific hurricane historical information available (i.e., central pressure, wind speed, forward velocity, eye diameter, radius of maximum winds and radius of hurricane force winds) and how the Pacific hurricane information is incorporated in the model.
  - e. What quality control reviews have been applied to the historical information?
  - f. Describe wind speed criteria used in the model (i.e., one-minute sustained vs. peak gusts, etc.)
  - g. Criteria used by the model whenever specific historical information is not available (i.e., wind speed derived from central pressure; calculation of Rmax; one-minute sustained vs. peak gust wind speeds)
  - h. Effects of land friction/surface roughness on hurricane strength
  - i. Effects of hurricane weakening/filling rates
  - j. Effects of geography and topography on modeled storm characteristics
  - k. Effects of atmospheric conditions (i.e., upper air currents) on hurricane tracks, intensity, etc.
  - l. Effects of bypassing storms on the historical inputs and the model output
8. Provide details (both written and graphic) of the process used to develop the expected paths for storms that impact Hawaii. Provide maps at two-and-a-half degree latitude and longitude grid resolution, showing the storm frequencies generated by the model for the domain bounded by the equator and 30N latitude and 140W longitude and the International Dateline.
9. Provide the 100 and 500- year recurrence interval 3 second gust windspeeds for the following airport locations:
  - a. Lihue
  - b. Honolulu
  - c. Kahului
  - d. Hilo
10. Provide details (both written and graphic) of the process used to develop the expected landfall frequencies of storms by hurricane strength for each area of Hawaii.
11. What is the minimum central pressure for all hurricanes in the stochastic storm set used for Hawaii? What is the source for verification of the minimum central pressure? What is the maximum wind speed associated with this hurricane in the model?

12. Provide detailed description of the process used to determine the vulnerability functions used in the model, and how the vulnerability functions are consistent with Hawaii's building stock.
  - a. Describe the basis of vulnerability function development relative to Hawaii construction characteristics.
  - b. Describe the studies and methods used in the development of the building stock.
  - c. Describe the studies and methods used in the validation and verification of the building stock.
  - d. Describe the studies and methods used in the development of the vulnerability functions.
  - e. Describe the studies and methods used in the validation and verification of the vulnerability functions.
  - f. Describe the studies and methods used to determine that the construction characteristics within the model appropriately reflect Hawaii construction characteristics.
13. Does the model produce credits for various forms of hazard mitigation? If so, provide the specific loss cost adjustments produced in the model for hazard mitigation, including but not limited to the following:
  - a. Mitigation category (i.e., opening protection, roof sheathing strengthening, roof to wall tie downs, complete load path, etc.)
  - b. Range of loss cost reductions produced from an unmitigated building
  - c. Basis of hazard mitigation loss cost adjustment derivations (i.e., site inspections, engineering evaluation report, test, etc.)
  - d. Justification for any variations in the loss cost changes (i.e., by island, etc.)
14. Provide details as to the process used in the model to provide for differences in the building stock among the Islands.
15. Provide data used to compare model outputs with historical data. Provide results of any such comparisons performed.
16. Provide the total aggregate zero deductible personal residential (homeowners plus dwelling policies) losses produced by your model for Hurricane Iniki.
17. Provide comparisons (in as much detail as model and data will allow) of Hurricane Iniki actual losses with model output losses for Hurricane Iniki.
18. Provide details as to how the model develops loss costs specifically for the each of the following:
  - a. buildings
  - b. contents
  - c. appurtenant structures
  - d. additional living expense
19. Provide details as to how the model incorporates each of the following criteria
  - a. deductibles
  - b. coinsurance
  - c. policy provisions (i.e., homeowners, dwelling policies)
  - d. policy limits
  - e. building codes
  - f. building code enforcement
  - g. quality of construction
20. Describe any tests performed to validate the following criteria, especially as the model relates to Hawaii:
  - a. wind speeds, directions, strengths (Meteorology)
  - b. damage estimates (Vulnerability)
  - c. loss costs produced by the model (Actuarial)

Memorandum 2003-3R

July 30, 2003

Page 4

21. Provide the two dimensional instantaneous windfield for the island of Kauai at the time of landfall for Hurricane Iniki as developed by the model at a one-mile grid resolution.

Questions or concerns to this memorandum should be submitted in writing and addressed to Shelley Santo, Rate and Policy Analysis Manager.

Cc: Applied Insurance Research/Applied Research Associates/EQECAT, Inc/Risk Management Solutions, Inc.