

Report of Activities as of November 1, 2013



Florida Commission on Hurricane Loss Projection Methodology

**FLORIDA COMMISSION ON HURRICANE
LOSS PROJECTION METHODOLOGY**

Post Office Box 13300, 32317-3300
1801 Hermitage Boulevard, Suite 100
Tallahassee, Florida 32308
(850) 413-1349
www.sbafla.com/methodology

Randy Dumm, Ph.D.
Insurance Finance Expert,
Florida State University

Lorilee Medders, Ph.D., Chair
Statistics Expert,
Florida State University

Jack Nicholson, Ph.D.
Chief Operating Officer,
Florida Hurricane Catastrophe Fund

Barry Gilway
President/CEO & Executive Director,
Citizens Property Insurance Corporation

Floyd Yager, FCAS, Vice Chair
Actuary,
Florida Hurricane Catastrophe Fund Advisory Council

Kristin Piltzecker, FCAS, MAAA
Actuary,
Property and Casualty Industry

Bryan Koon
Director,
Florida Division of Emergency Management

Hugh Willoughby, Ph.D.
Meteorology Expert,
Florida International University

Robert Lee, FCAS
Actuary,
Florida Office of Insurance Regulation

Vacant
Insurance Consumer Advocate,
Florida Department of Financial Services

Jainendra Navlakha, Ph.D.
Computer Systems Design Expert,
Florida International University

Vacant
Licensed Professional Structural Engineer

November 1, 2013

The Honorable Rick Scott, Chairman
Governor
Plaza Level 02, The Capitol
Tallahassee, Florida 32399

The Honorable Pam Bondi, Secretary
Attorney General
Plaza Level 01, The Capitol
Tallahassee, Florida 32399

The Honorable Jeff Atwater, Treasurer
Chief Financial Officer
Plaza Level 11, The Capitol
Tallahassee, Florida 32399

Dear Trustees:

As Chair of the Florida Commission on Hurricane Loss Projection Methodology (Commission), I am pleased to present to you the *Report of Activities as of November 1, 2013*. This report documents the eighteenth year of the Commission's work.

Section 627.0628, F.S., created the Commission as a panel of experts to be administratively housed in the State Board of Administration but requires the Commission to independently exercise its power and duties. The Commission is required to "...adopt revisions to previously adopted actuarial methods, principles, standards, models, or output ranges every odd year." Such revisions were made in compliance with the statute.

If you have any questions or comments regarding the work of the Commission, please call me at (850) 645-8393.

Sincerely,


Lorilee Medders, Chair

Florida Commission on Hurricane Loss Projection Methodology
P. O. Box 13300
Tallahassee, Florida 32317-3300
Staff: 850-413-1349, Fax: 850-413-1344
Website: *www.sbafla.com/methodology*

Commission Members:

Lorilee Medders, Ph.D., Chair
Statistics Expert, Florida State University

Floyd Yager, FCAS, Vice Chair
Actuary, Florida Hurricane Catastrophe Fund Advisory Council

Randy Dumm, Ph.D.
Insurance Finance Expert,
Florida State University

Jack Nicholson, Ph.D., CLU, CPCU
Chief Operating Officer,
Florida Hurricane Catastrophe Fund

Barry Gilway
President/CEO & Executive Director,
Citizens Property Insurance Corporation

Kristin Piltzecker, FCAS, MAAA
Actuary,
Property and Casualty Industry

Bryan Koon
Director,
Florida Division of Emergency Management

Hugh Willoughby, Ph.D.
Meteorology Expert,
Florida International University

Robert Lee, FCAS
Actuary,
Florida Office of Insurance Regulation

Vacant
Insurance Consumer Advocate,
Florida Department of Financial Services

Jainendra Navlakha, Ph.D.
Computer System Design Expert,
Florida International University

Vacant
Licensed Professional Structural Engineer

Professional Team Members:

Mark Brannon, FCAS, MAAA, CPCU, Actuary
Jenni Evans, Ph.D., Meteorologist
Paul Fishwick, Ph.D., Computer Scientist
Ronald Iman, Ph.D., Statistician
Mark Johnson, Ph.D., Statistician, Team Leader
Greg McLellan, P.E., Structural Engineer
Richard Nance, Ph.D., Computer Scientist
Tom Schroeder, Ph.D., Meteorologist
Martin Simons, ACAS, MAAA, FCA, Actuary
Masoud Zadeh, Ph.D., P.E., Structural Engineer

Staff Members:

Anne Bert
Leonard Schulte
Donna Sirmons
Ramona Worley

TABLE OF CONTENTS

	PAGE
I. Introduction	8
II. Principles	14
III. Commission Structure	17
IV. Findings of the Commission	39
1. Concerning Model Accuracy and Reliability	40
2. Concerning Trade Secrets	42
V. Process for Determining the Acceptability of a Computer Simulation Model	43
• Model Submission Checklist	67
VI. On-Site Review	69
VII. 2013 Standards, Disclosures, and Forms	77
1. Model Identification	78
2. Submission Data	79
3. Comparison of 2013 Standards to 2011 Standards	84
4. General Standards	85
G-1 Scope of the Computer Model and Its Implementation	85
G-2 Qualifications of Modeling Organization Personnel and Consultants	89
G-3 Risk Location	92
G-4 Independence of Model Components	94
G-5 Editorial Compliance	95
Form G-1 General Standards Expert Certification	97
Form G-2 Meteorological Standards Expert Certification	98
Form G-3 Statistical Standards Expert Certification	99
Form G-4 Vulnerability Standards Expert Certification	100
Form G-5 Actuarial Standards Expert Certification	101
Form G-6 Computer Standards Expert Certification	102
Form G-7 Editorial Certification	103
5. Meteorological Standards	104
M-1 Base Hurricane Storm Set	104
M-2 Hurricane Parameters and Characteristics	106
M-3 Hurricane Probabilities	108
M-4 Hurricane Windfield Structure	110
M-5 Landfall and Over-Land Weakening Methodologies	113
M-6 Logical Relationships of Hurricane Characteristics	115
Form M-1 Annual Occurrence Rates	116
Form M-2 Maps of Maximum Winds	120
Form M-3 Radius of Maximum Winds and Radii of Standard Wind Thresholds	121

TABLE OF CONTENTS

		PAGE
6.	Statistical Standards	122
	S-1 Modeled Results and Goodness-of-Fit	122
	S-2 Sensitivity Analysis for Model Output	124
	S-3 Uncertainty Analysis for Model Output	126
	S-4 County Level Aggregation	128
	S-5 Replication of Known Hurricane Losses	129
	S-6 Comparison of Projected Hurricane Loss Costs	131
	Form S-1 Probability and Frequency of Florida Landfalling Hurricanes per Year	132
	Form S-2A Examples of Loss Exceedance Estimates (2007 FHCF Exposure Data)	133
	Form S-2B Examples of Loss Exceedance Estimates (2012 FHCF Exposure Data)	134
	Form S-3 Distributions of Stochastic Hurricane Parameters	135
	Form S-4 Validation Comparisons	136
	Form S-5 Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled	138
	Form S-6 Hypothetical Events for Sensitivity and Uncertainty Analysis	140
7.	Vulnerability Standards	153
	V-1 Derivation of Vulnerability Functions	153
	V-2 Derivation of Contents and Time Element Vulnerability Functions	157
	V-3 Mitigation Measures	160
	Form V-1 One Hypothetical Event	163
	Form V-2 Mitigation Measures – Range of Changes in Damage	166
	Form V-3 Mitigation Measures – Mean Damage Ratios and Loss Costs (Trade Secret item)	168
8.	Actuarial Standards	171
	A-1 Modeling Input Data	171
	A-2 Event Definition	173
	A-3 Coverages	174
	A-4 Modeled Loss Cost and Probable Maximum Loss Considerations	175
	A-5 Policy Conditions	177
	A-6 Loss Output	179
	Form A-1 Zero Deductible Personal Residential Loss Costs by ZIP Code	184
	Form A-2 Base Hurricane Storm Set Statewide Losses	186
	Form A-3A 2004 Hurricane Season Losses (2007 FHCF Exposure Data)	189
	Form A-3B 2004 Hurricane Season Losses (2012 FHCF Exposure Data)	190
	Form A-4A Output Ranges (2007 FHCF Exposure Data)	191
	Form A-4B Output Ranges (2012 FHCF Exposure Data)	194
	Form A-5 Percentage Change in Output Ranges (2007 FHCF Exposure Data)	197
	Form A-6 Logical Relationship to Risk (Trade Secret item)	199
	Form A-7 Percentage Change in Logical Relationship to Risk	202
	Form A-8 Probable Maximum Loss for Florida	203

TABLE OF CONTENTS

	PAGE
9. Computer Standards	206
C-1 Documentation	206
C-2 Requirements	208
C-3 Model Architecture and Component Design	210
C-4 Implementation	212
C-5 Verification	214
C-6 Model Maintenance and Revision	216
C-7 Security	218
10. Working Definitions of Terms Used in the <i>Report of Activities</i>	219
11. References	237
VIII. Inquiries or Investigations	240
IX. Appendices	247
1. Florida Statutes, 2013	248
Section 627.0628	
Florida Commission on Hurricane Loss Projection Methodology	248
Section 627.701(5)-(9)	
Liability of Insureds, Coinsurance, Deductibles	252
2. Meeting Schedule and Topics of Discussion	255
3. Transcript Information	261
4. Commission Documentation	265
Figures	
<i>Figure 1</i> Florida County Codes	82
<i>Figure 2</i> State of Florida Map by County	83
<i>Figure 3</i> State of Florida and Neighboring States Map by Region	119
<i>Figure 4</i> Probability Distributions for Model Input Variables	141
<i>Figure 5</i> Uncertainty Envelope for the Conversion Factor	143
<i>Figure 6</i> Grid for Calculating Hourly Wind Velocities	144
<i>Figure 7</i> Map Version of Grid for Calculating Hourly Wind Velocities	144
<i>Figure 8</i> Comparison of Cumulative Empirical Distribution Functions of Loss Costs for all Hurricane Categories	146
<i>Figure 9</i> Contour Plot of Loss Cost for a Category 1 Hurricane	147
<i>Figure 10</i> Contour Plot of Loss Cost for a Category 3 Hurricane	148
<i>Figure 11</i> Contour Plot of Loss Cost for a Category 5 Hurricane	148

TABLE OF CONTENTS

		PAGE
<i>Figure 12</i>	Standardized Regression Coefficients for Expected Loss Cost for all Input Variables for all Hurricane Categories	150
<i>Figure 13</i>	Expected Percentage Reduction for Expected Loss Cost for all Input Variables for all Hurricane Categories	151
<i>Figure 14</i>	State of Florida Map by North/Central/South Regions	198
<i>Figure 15</i>	State of Florida Map by Coastal/Inland Counties	198

I. INTRODUCTION

INTRODUCTION

Legislative Findings and Intent

In 1995, the Florida Legislature enacted s. 627.0628, Florida Statutes (F.S.), creating the Florida Commission on Hurricane Loss Projection Methodology (Commission).¹ The Legislature specifically determined that “reliable projections of hurricane losses are necessary to assure that rates for residential insurance are neither excessive nor inadequate,” and that in recent years computer modeling has made it possible to improve on the accuracy of hurricane loss projections. The Legislature found that “it is the public policy of this state to encourage the use of the most sophisticated actuarial methods to ensure that consumers are charged lawful rates for residential property insurance coverage.”² The Legislature clearly supports and encourages the use of computer modeling as part of the ratemaking process.

The Role of the Commission

Although the statutory section creating the Commission is in the Florida Insurance Code, the Commission is an independent body and is administratively housed in the State Board of Administration of Florida (SBA). The role of the Commission is limited to adopting findings relating to the accuracy or reliability of particular methods, principles, standards, models, or output ranges used to project hurricane losses.

Section 627.0628(3)(c), F.S., states that “to the extent feasible,” the SBA must “employ actuarial methods, principals, standards, models, or output ranges found by the Commission to be accurate or reliable” in formulating reimbursement premiums for the Florida Hurricane Catastrophe Fund (FHCF). Under s. 627.0628(3)(d), F.S., individual insurers are required to use the Commission’s findings in order to support or justify a rate filing as follows, “an insurer shall employ and may not modify or adjust actuarial methods, principles, standards, models, or output ranges found by the commission to be accurate or reliable in determining hurricane loss factors for use in a rate filing” with the Office of Insurance Regulation (OIR), and “an insurer shall employ and may not modify or adjust models found by the commission to be accurate or reliable in determining probable maximum loss levels...with respect to a rate filing...made more than 60 days after the commission has made such findings.”

The Legislature addressed the definition of and the protection of trade secrets used in designing and constructing a hurricane loss model in 2005 and again in 2010. In s. 627.0628(3)(f), F.S.,³ the Legislature found that it is a public necessity to protect trade secrets used in designing and constructing hurricane loss models, and therefore, allowed an exemption from the public records law requirements and the public meetings law requirements. The goal of this legislation was to enable the Commission to have access to all aspects of hurricane loss models and to encourage private companies to submit such models for review without concern that trade secrets will be disclosed. The exemption applies to trade secrets, as defined in s. 812.081, F.S., used in the design and construction of a hurricane loss model being exempt pursuant to s. 627.0628(3)(f),

¹ CS/HB 2619 (Ch. 95-276, Laws of Florida).

² Section 627.0628(1)(a), F.S.

³ Created in 2005 by HB 1939 (Ch. 2005-264, Laws of Florida).

F.S., from the requirements of the public records law s. 119.07(1), F.S., including s. 24(a), Article I of the State Constitution and the public meetings law s. 286.011, F.S., including s. 24(b), Article I of the State Constitution.

In 2010 the Legislature revised the scope of the public records exemption by providing that the definition of “trade secret” in the Uniform Trade Secrets Act would apply in place of the definition in s. 812.081, F.S.⁴ The effect of this change was to make the public records exemption for trade secrets consistent with other similar exemptions.

The 2010 legislation also required that any portion of a closed Commission meeting be recorded. No portion of the closed meeting may be off the record. The bill also created a public records exemption for the recordings of closed meetings.

The Work of the Commission

The Commission was created as a panel of experts to evaluate computer models and other recently developed or improved actuarial methodologies for projecting hurricane losses and probable maximum loss levels so as “to resolve conflicts among actuarial professionals” and “to provide both immediate and continuing improvement in the sophistication of actuarial methods used to set rates.”⁵

Sections 627.0628(3)(a) and (b), F.S., define the role of the Commission:

The commission shall consider any actuarial methods, principles, standards, models, or output ranges that have the potential for improving the accuracy of or reliability of the hurricane loss projections used in residential property insurance rate filings. The commission shall, from time to time, adopt findings as to the accuracy or reliability of particular methods, principles, standards, models, or output ranges.

The commission shall consider any actuarial methods, principles, standards, or models that have the potential for improving the accuracy of or reliability of projecting probable maximum loss levels. The commission shall adopt findings as to the accuracy or reliability of particular methods, principles, standards, or models related to probable maximum loss calculations.

The statutory language is clear in that those methods or models that have the potential for improving the accuracy or reliability of hurricane loss projections and probable maximum loss levels are the ones to be considered by the Commission. “Improving” suggests that the methods

⁴ HB 7119 (Ch. 2010-90, Laws of Florida). The language in s. 812.081, F.S., defines trade secrets which relate to theft, robbery, and related crimes. Under s. 688.002(4), F.S., “trade secret” means information, including a formula, pattern, compilation, program, device, method, technique, or process that:

- (a) Derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use; and
- (b) Is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

⁵ Section 627.0628(1)(b), F.S.

or models should be an improvement over the then existing current methods or models used in the residential rate filing process prior to the Commission's enactment.

Section 627.0628(3)(e), F.S., originally established two deadlines for the Commission to take action. No later than December 31, 1995, the Commission was required to "adopt initial actuarial methods, principles, standards, models, or output ranges." No later than July 1, 1996, the Commission was required to "adopt revised actuarial methods, principles, standards, models, or output ranges which include specification of acceptable computer models or output ranges derived from computer models." The Commission met both those deadlines. To achieve the requirements of the Florida Statutes, in 1995 the Commission developed the following three-step evaluation process:

1. Identification of methods or models – models were identified in the following ways: (1) by referral after having been rejected by the Department of Insurance (now OIR); (2) by being submitted directly to the Commission; or (3) by the Commission's soliciting them directly from the sponsor or owner.

2. Analysis of the method or model – the Commission adopted standards and five modules to assist in its analysis. The modules were as follows:

- Module 1 – Description of the Model
- Module 2 – Background and Professional Credentials of the Modeling Organization
- Module 3 – Tests of the Model
- Module 4 – Professional Team On-Site Review
- Module 5 – Modeling Organization Presentation

3. Adoption of findings – the Commission may (1) accept a method or model, model specifications, or output ranges derived from computer models; or (2) accept the method or model, model specifications, or output ranges subject to modification; or (3) reject the method or model, model specifications, or output ranges.

In an effort to streamline the model submission and eliminate redundancies, the Commission conducted a complete and thorough reorganization of the *Report of Activities* in 2003. Part of the reorganization included renaming and incorporating the questions and forms in Modules 1–3 to sub-sections of the standards called disclosures and forms. Module 4 was moved to a separate section called On-Site Review, and Module 5 was moved to the acceptability process. The standards were realigned to facilitate the Commission voting process.

As originally required in s. 627.0628(3)(e), F.S., the Commission adopted revisions to actuarial methods, principals, standards, models, or output ranges on an annual basis. The Commission initially adopted standards for the specifications of a computer model on June 3, 1996. Those original standards have subsequently been revised and then adopted on the following dates:

- | | |
|-------------------------|---------------------------------|
| May 29, 1997 | September 19 & October 15, 2001 |
| April 24 & May 21, 1998 | September 18 & 19, 2002 |
| August 17, 1999 | August 21 & 22, 2003 |
| September 14 & 15, 2000 | October 6 & 7, 2004 |

September 14 & 15, 2005
August 17 & 18, 2006
September 20 & 21, 2007
September 17 & 18, 2008

September 15 & 16, 2009
October 19, 20 & November 16, 2011
September 24 & 25, 2013.

The Commission has operated on a biennial cycle since 2009. In 2009 the Legislature amended s. 627.0628(3)(e), F.S., to require the Commission to adopt revisions to actuarial methods, principles, standards, models, or output ranges every odd-numbered year. Under the prior law, these were adopted annually.⁶ The standards in this *Report of Activities* were revised and adopted on September 24 & 25, 2013. The Commission will again adopt revisions to the standards in 2015.

Also in 2009, the Legislature added subsection (4) to s. 627.0628, F.S., requiring the Commission to “hold public meetings for the purpose of receiving testimony and data regarding the implementation of windstorm mitigation discounts, credits, other rate differentials, and appropriate reductions in deductibles pursuant to s. 627.0629.”⁷ The legislation further required the Commission to present a report to the Governor, the Cabinet, the President of the Senate, and the Speaker of the House of Representatives by February 1, 2010, on its recommendations for “improving the process of assessing, determining, and applying windstorm mitigation discounts, credits, other rate differentials, and appropriate reductions in deductibles pursuant to s. 627.0629.”

The Commission held six public meetings for the purpose of receiving testimony and data regarding the implementation of windstorm mitigation discounts. The input and data received during the process, as well as other information gathered by the Commission, resulted in the Windstorm Mitigation Discounts Report. The report includes the Commission’s findings and recommendations designed to improve the mitigation discount process.

The Mission Statement

At the September 21, 1995, Commission meeting, the following mission statement was adopted:

The mission of the Florida Commission on Hurricane Loss Projection Methodology is to assess the efficacy of various methodologies which have the potential for improving the accuracy of projecting insured Florida losses resulting from hurricanes and to adopt findings regarding the accuracy or reliability of these methodologies for use in residential rate filings.

The mission statement closely tracks the statute and restates the critical aspects of the Commission’s work. Minor revisions to the mission statement were adopted on November 30, 1995, and can be found in the Principles section of this report.

⁶ CS/SB 1758 (Ch. 2009-81, Laws of Florida).

⁷ CS/CS/CS HB 1495 (Ch. 2009-87, Laws of Florida).

The mission statement was revised again on September 15, 2009, to reflect the Commission’s role in reviewing models for their ability for projecting probable maximum loss levels. Thus, the mission statement was modified, as follows:

The mission of the Florida Commission on Hurricane Loss Projection Methodology is to assess the effectiveness of various methodologies which have the potential for improving the accuracy of projecting insured Florida losses and probable maximum loss levels resulting from hurricanes and to adopt findings regarding the accuracy or reliability of these methodologies for use in residential rate filings and probable maximum loss calculations.

Overview

To date, the following models have been evaluated by the Commission against the standards for the applicable years listed below and were found acceptable.

<u>Modeling Organization</u>	<u>Standards</u>
AIR Worldwide Corporation	1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2011
Applied Research Associates, Inc.	1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2011
E.W. Blanch Co.	1998, 1999, 2000
EQECAT, Inc.	1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2011
Florida Public Hurricane Loss Model	2006, 2007, 2008, 2009, 2011
Risk Management Solutions, Inc.	1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2011
Tillinghast–Towers Perrin	1998

II. PRINCIPLES

PRINCIPLES

1. The mission of the Florida Commission on Hurricane Loss Projection Methodology is to assess the effectiveness of various methodologies which have the potential for improving the accuracy of projecting insured Florida losses and probable maximum loss levels resulting from hurricanes and to adopt findings regarding the accuracy or reliability of these methodologies for use in residential rate filings and probable maximum loss calculations. *History-New 9/21/95, rev. 11/30/95, rev. 9/15/09*
2. The Commission shall consider the costs and benefits associated with its review process, including costs and benefits to the State and its citizens, to the insurance industry, and to the modeling organizations. *History-New 8/18/06*
3. The general focus of the Commission shall be on those areas of modeling which produce the most variation in output results and have the most promise of improving the science of modeling. *History-New 8/18/06*
4. The Commission shall pursue and promote research opportunities from time to time when issues need resolution and such research would advance the science of modeling. *History-New 8/18/06*
5. All models or methods shall be theoretically sound. *History-New 9/21/95, rev. 8/18/06*
6. The Commission's review process shall be active and designed to test model output for reasonableness and to test model assumptions. *History-New 8/18/06*
7. Models or methods shall not be biased in a way that overstates or understates results. *History-New 9/21/95, rev. 8/18/06*
8. All sensitive components of models or methods shall be identified. *History-New 9/21/95, rev. 8/18/06*
9. The trade secret aspects of models or methods being reviewed by the Commission shall be protected. *History-New 11/30/95, rev. 5/20/96, rev. 9/14/05, rev. 8/18/06*
10. Commission members shall have sufficient information concerning model assumptions and factors used in model development, whether trade secret or not, to make a finding about a model's acceptability. *History-New 8/18/06*
11. The Commission's review process of models or methods shall not restrict competition in the catastrophe modeling industry or thwart innovation in that industry. *History-New 11/30/95, rev. 5/20/96, rev. 8/18/06*
12. The Commission shall consider how advances in science or technology shall be incorporated in its revision of standards, and, where and when appropriate, develop new standards or revise existing standards to reflect these advances. *History-New 8/18/06, rev. 9/16/09*

13. The Commission shall consider how statutory changes shall be incorporated in its revision of standards, and, where and when appropriate, develop new standards or revise existing standards to reflect these statutory changes. *History-New 8/18/06, rev. 9/16/09*
14. The Commission's review of models or methods for acceptability shall give priority to new standards and standards that have been modified. *History-New 8/18/06, rev. 9/16/09*
15. The output of models or methods shall be reasonable and the modeling organization shall demonstrate its reasonableness. *History-New 9/21/95, rev. 8/22/03, rev. 8/18/06*
16. All adoptions of findings and any other formal action taken by the Commission shall be made at a publicly-noticed meeting, by motion followed by a formal member by member roll call vote, all of which shall be transcribed by a court reporter, such transcription to be made a part of the official record of the proceedings of the Commission. The Commission shall not record a transcript for the portion of a Commission meeting where trade secrets used in the design and construction of the hurricane loss model are discussed. No official action or decision shall be made in a closed meeting. *History-New 11/30/95, rev. 8/22/03, rev. 9/14/05, rev. 8/18/06, rev. 9/15/09*
17. All findings adopted by the Commission are subject to revision at the discretion of the Commission. *History-New 11/30/95*
18. No model or method shall be determined to be acceptable by the Commission until it has been evaluated by the Commission in accordance with the process and procedures which the Commission considers appropriate for that model or method. *History-New 11/30/95, rev. 5/20/96, rev. 8/18/06*
19. The Commission's determination of acceptability of a specific model or method does not constitute determination of acceptability of other versions or variations of that model or method; however, the Commission shall attempt to accommodate routine updating of acceptable models or methods. *History-New 11/30/95, rev. 5/20/96, rev. 8/18/06*
20. The Commission shall consider the educational needs of its members and from time to time implement educational programs that further Commission members' understanding of the science of modeling. *History-New 8/18/06*

III. COMMISSION STRUCTURE

COMMISSION STRUCTURE

Oversight

The Commission was created, pursuant to s. 627.0628, F.S., “to **independently** exercise the powers and duties specified” in that statute. The Commission is administratively housed within the State Board of Administration of Florida (SBA), and as a cost of administration, the Florida Hurricane Catastrophe Fund (FHCF) provides travel reimbursement, expenses, and staff support. The SBA has no governing authority over the Commission; however, the SBA annually appoints one of the Commission members to serve as Chair, appoints one of the Commission members who is the actuary member of the FHCF Advisory Council, and has final approval authority over the Commission’s budget.

Membership and Required Expertise

Section 627.0628(2)(b), F.S., requires that the Commission consist of twelve members with the following qualifications and expertise:

1. The Insurance Consumer Advocate;
2. The senior employee of the State Board of Administration responsible for operations of the Florida Hurricane Catastrophe Fund;
3. The Executive Director of the Citizens Property Insurance Corporation;
4. The Director of the Division of Emergency Management;
5. The actuary member of the Florida Hurricane Catastrophe Fund Advisory Council;
6. An employee of the Florida Department of Financial Services, Office of Insurance Regulation who is an actuary responsible for property insurance rate filings and who is appointed by the Director of the Office of Insurance Regulation;
7. Five members appointed by the Chief Financial Officer, as follows:
 - a. An actuary who is employed full time by a property and casualty insurer which was responsible for at least 1 percent of the aggregate statewide direct written premium for homeowner’s insurance in the calendar year preceding the member’s appointment to the Commission;
 - b. An expert in insurance finance who is a full time member of the faculty of the State University System and who has a background in actuarial science;
 - c. An expert in statistics who is a full time member of the faculty of the State University System and who has a background in insurance;
 - d. An expert in computer system design who is a full time member of the faculty of the State University System;
 - e. An expert in meteorology who is a full time member of the faculty of the State University System and who specializes in hurricanes;
8. A licensed professional structural engineer who is a full-time faculty member in the State University System and who has expertise in wind mitigation techniques. This appointment shall be made by the Governor.

The licensed professional structural engineer was added by virtue of CS/SB 1770, which was enacted and became law in 2013. This legislation amended the requirements in s. 627.0628(2)(b), F.S., and enhanced the expertise immediately available to the Commission by increasing the membership to provide for the appointment of an additional member with special qualifications or attributes.

Terms of Members

The Insurance Consumer Advocate, Chief Operating Officer of the FHCF, Executive Director of Citizens Property Insurance Corporation, Director of the Division of Emergency Management, and the actuary member of the FHCF Advisory Council shall serve as a Commission member for as long as the individual holds the position listed.

The member appointed by the Director of the Office of Insurance Regulation shall serve until the end of the term of office of the Director who appointed him or her, unless removed earlier by the Director for cause. The five members appointed by the Chief Financial Officer shall serve until the end of the Chief Financial Officer's term of office, unless the Chief Financial Officer releases them earlier for cause (s. 627.0628(2)(c), F.S.).

Officers

Officers: The officers of the Commission shall be a Chair and a Vice Chair.

Selection: Annually, the SBA shall appoint one of the Commission members to serve as the Chair (s. 627.0628(2)(d), F.S.). After the Chair is appointed, the Commission shall, by majority roll call vote, select a Vice Chair.

Duties of the Chair and Vice Chair:

A. The **CHAIR** shall:

1. Preside at all meetings except during committee meetings where other Commission members are designated to act as committee chairs;
2. Conduct a roll call of members at each meeting;
3. Ensure all procedures established by the Commission are followed;
4. Designate one of the Commission members to act in the role of Chair at any meeting where the Chair and Vice Chair cannot attend;
5. Assign members to serve on Committees and appoint Committee Chairs.

B. The **VICE CHAIR** shall:

In the absence or request of the Chair, preside at Commission meetings and have the duties, powers, and prerogatives of the Chair.

Executive Committee

The Executive Committee shall consist of the Chair, the Vice Chair, and three Committee Chairs which shall be appointed by the Chair. The purpose and role of the Executive Committee shall be to determine priorities for each biennial cycle for model review.

Member Duties and Responsibilities

The purpose of the Commission is to adopt findings relating to the accuracy or reliability of particular methods, principles, standards, models, or output ranges used to project hurricane losses and probable maximum loss levels. This work is extremely technical and requires specialized expertise. Therefore, the Legislature, in s. 627.0628, F.S., limited membership on the Commission to a careful balance of individuals meeting specific employment, education, and expertise requirements. Thus, each member's contribution cannot be underestimated and each member should make every effort to attend all meetings, in person or by telephone, and be prepared to actively participate. In particular, each member has the following responsibilities and duties:

1. Fully prepare for each Commission meeting and committee meeting where the member is designated as a committee member;
2. Attend and participate at each meeting in person or by telephone;
3. Give notice to SBA staff, in advance if possible, when a member must leave a meeting early or cannot attend at all;
4. Abide by the requirements of Florida's Sunshine Law. A summary of the requirements of this law is outlined in this section;
5. Since it is the SBA's responsibility to fund all Commission activities, all communications related directly to Commission activities shall be directed to SBA staff who are responsible for administrative support of the Commission. Directly related to Commission activities, the following communications should not take place:
 - a. Commission members should not contact Professional Team members or modeling organizations directly, except in conjunction with communications during the on-site visit of a Commission member,
 - b. Modeling organizations should not contact Commission members or Professional Team members directly,
 - c. Professional Team members should not contact Commission members or modeling organizations directly,

A Committee Chair or the Commission Chair may, in conjunction with SBA staff, contact a modeling organization or outside party for the purpose of clarifying or refining input or suggested changes to the *Report of Activities*;

6. Give notice of "special" conflicts of interest where the member, the member's relative, business associate, or any principal by whom he or she is retained stands to reap a direct financial benefit or suffer a potential loss from the issue being voted on. Financial benefit which is speculative, uncertain, or subject to many contingencies is not a special benefit that would preclude a member from voting. See Attorney General's Opinion 96-63 (September 4, 1996) and Commission on Ethics Opinion 94-18 (April 21, 1994). If a special conflict of interest arises and the special conflict is apparent prior to the meeting, the member must give advance notice to SBA staff. If the special conflict becomes apparent during a meeting, the member should immediately inform the Chair or Vice

Chair. The conflicted member shall recuse himself or herself from any activity of the Commission in the area of the special conflict;

7. Commission members are expected to meet the highest standards of ethical behavior. Commission members may be subject to the Code of Ethics for Public Officers and Employees, ss. 112.311-112.326, F.S., including, but not limited to, s. 112.313(7), F.S., relating to conflicting employment or contractual relationships; s. 112.3143, F.S., relating to voting conflicts; and s. 112.3145, F.S., relating to disclosure of financial interests. It is understood, given the nature of the expertise held by Commission members, that general conflicts of interest are inherent. The conflicts of interest which are addressed in s. 112.3143, F.S., and the conflicts which would preclude a Commission member from voting on an issue are only those conflicts which are special. Additionally, Commission members should be mindful of situations which may arise that have the potential to give an unfair advantage to any modeling organization or result in a particular Commission member having unique information and being in a position to exercise greater influence than other Commission members.

New Member Orientation and Continuing Education of Existing Members

As part of the SBA's administrative support of the Commission, the SBA staff will be responsible for new member orientation. The SBA staff may also design programs for continuing education at the request of the Commission. The cost of such programs is subject to approval through the state budgetary process as outlined under ***Budget Consideration***.

On-Site Visits to the Modeling Organization by Commission Members

The 2005 legislative changes to s. 627.0628, F.S., specified that the goal was to enable the Commission to have access to all aspects of hurricane loss models. Since both a public records exemption and a public meetings exemption are provided in the law, Commission members are able to review trade secrets in much more depth and able to inquire into the underlying nature of the models without exposing such trade secret information to modeling organization competitors.

Although reliance on the expertise of the Professional Team will continue to be necessary in the Commission's review process, it is anticipated that Commission members may request to have greater access to the model by going to the modeling organization's location for an on-site visit.

The procedure for on-site visits and additional verification review visits will require that the Commission member obtain approval from the Commission and obtain authorization from the SBA for reimbursable travel (due to budget considerations). The deadline for requesting on-site visits, which will include any additional verification review visits, will be seven days prior to the Commission meeting to review modeling organization submissions in order for the requests to be placed on the meeting agenda.

Travel arrangements will be coordinated through SBA staff and in accordance with the SBA's travel policy. Commission members are responsible for their own transportation arrangements to/from and during the on-site visits. Commission members shall dress in a manner that is appropriate and professional.

The Commission member's on-site visit shall take place at the same time as the Professional Team's on-site or additional verification review. The Commission member's presence shall not disrupt the activities or work of the Professional Team. This procedure will limit Commission member(s) participation to that of an observer during the Professional Team activities and their review process. The Commission member may ask questions of the modeling organization in meetings separate from those of the Professional Team. Given time and resource constraints, all reasonable attempts will be made to schedule meetings between the modeling organization and Commission members, and the modeling organization should make its best effort to be available to answer the Commission member's questions.

If any notes are taken by a Commission member, the notes identified by the modeling organization as trade secret will be placed in a sealed envelope marked "Confidential" with the date, time, and Commission member's signature across the seal. The notes will be kept by the modeling organization and returned to the Commission member during the closed meeting to discuss trade secrets. At the conclusion of the closed meeting, all notes will be returned to the modeling organization.

It should also be noted that the job of the Professional Team while on-site is to review the model rather than to educate Commission members. The education of Commission members by the Professional Team is better accomplished in other settings.

Commission members will refrain from discussing the model among themselves while on-site and will be mindful of the requirements of the public meeting laws of Florida. Since Professional Team members have signed contracts with the SBA that contain a confidentiality clause accepted by each modeling organization and are prohibited from discussing such proprietary information, Commission members cannot be included in any activities, meetings, or deliberations of the Professional Team.

Trade Secret Documents for Review On-Site by Commission Members: The Professional Team reviews the Audit section of the *Report of Activities* while on-site, and a Commission member may have additional questions or prefer a more in-depth discussion about a particular audit item. In order for the modeling organization to have the necessary personnel and documents available, Commission member(s) shall identify the items from the Audit section of the *Report of Activities* that they are particularly interested in reviewing on-site. Each Commission member may create a prioritized list of items to be provided to SBA staff no later than the Commission meeting to review modeling organization submissions. The list will be provided to the modeling organization with the Professional Team pre-visit letter, in preparation for the member's on-site visit.

All items included in the Audit section are of equal importance since all are required for verification of the standards. Because the time required to review the different audit items will vary, Commission members should prioritize the items they request to review based upon their expertise and interest. Due to time constraints, it will be the responsibility of the member(s) to allocate their time accordingly while on-site.

Documents Containing Trade Secrets Used in the Design and Construction of Hurricane Loss Models

Material Containing Potential Model Trade Secrets to be Visually Displayed or Discussed during Closed Meetings (Trade Secret items): The Commission may develop a Trade Secret List of information, documents, and presentation materials that contain potential trade secrets used in the design or construction of the hurricane loss model that the Commission wants to review during the closed portion of the Commission meeting to review models for acceptability in addition to the trade secret items identified in the *Report of Activities*.

The trade secret material shown to the Commission will be under the control of the modeling organization. This information, by law, shall be confidential and exempt from the State's public records requirements.

Closed Meetings for the Purpose of Discussing Trade Secrets Used in the Design and Construction of Hurricane Loss Models

There is an exemption from public meeting requirements for those portions of a Commission meeting where trade secrets, used in the design and construction of hurricane loss models, are discussed. The closed portion of a Commission meeting where trade secrets are reviewed and discussed will be held prior to the public portion of the Commission meeting to review models for acceptability. Voting regarding the acceptability of a model shall only take place during the public portion of the meeting. During any closed meeting, Commission members shall confine their discussions to trade secrets related to that particular model under consideration. Discussions other than those involving trade secrets shall take place during the public portion of the meeting. Only public information that is absolutely essential to the understanding of the trade secret information may be provided along with the trade secret information during the closed meeting. Any such public information discussed must be discussed during the public portion of the meeting to ensure full access of the public to that information.

In accordance with s. 627.0628(3)(f), F.S., the closed portion of a Commission meeting will be recorded electronically as per SBA policies and procedures. The recording is exempt from s. 119.07(1), F.S., and s. 24(a), Article 1 of the State Constitution.

Attendees: The only authorized attendees of the closed portion of the Commission meeting to review models for acceptability shall include Commission members, Commission staff, Professional Team members, and modeling organization designated personnel, staff, and consultants.

Role of Professional Team: The discussion of trade secrets may involve verbal explanations, review of documents, and various types of demonstrations. Although the Professional Team will be present during the discussion of trade secrets, they should be viewed by the Commission members as a resource to confirm that the information being provided is consistent with the information provided on-site. Questions related to modeling organization trade secrets should be addressed directly to the modeling organization rather than to the Professional Team members.

Room Requirements: Before the closed portion of the Commission meeting to review models for acceptability begins, the room will be cleared of all unauthorized persons and all their belongings. No briefcases, cellular phones, laptops, or other electronic devices shall be accessible to the authorized attendees during the closed meeting other than equipment needed by the modeling organization and equipment required by the Commission to accommodate Commission members.

All telephone lines and all microphones will be checked to ensure that discussions cannot be heard, relayed, or recorded beyond the confines of the room. Personnel outside of the meeting room will be asked to move to a distance where discussions cannot be inadvertently overheard or visual presentations seen. No telephone calls shall be made or received from the meeting room during the discussions of trade secrets other than those needed to meet the needs of the modeling organization. Authorized attendees needing to make or receive telephone calls will be required to leave the meeting room to handle such communications. Any notes taken by authorized attendees, other than the modeling organization, will be collected and shredded at the conclusion of the closed meeting and prior to anyone leaving the meeting room. During the closed meeting, internet access may be available where modeling organizations may choose to provide direct access to the model by electronic means to help answer questions of Commission members.

Teleconference: Due to security reasons, a teleconference call-in number will not be available to authorized attendees. If requested by the modeling organization, Commission staff will contact, from the meeting room, additional modeling organization personnel to allow their participation by phone.

Breaks: If a break is taken during a closed meeting, authorized attendees will not discuss any of the proceedings from the time the meeting doors are open until they are closed following the conclusion of the break. No notes or other recorded information may be taken out of the meeting room during a break. Other than authorized attendees, no one will be allowed to enter the meeting room during a break with the exception of building maintenance personnel, food or beverage service personnel, or electronic technicians needed to provide services for the meeting room.

Transcripts: The Commission will not record a transcript for the closed portion of a Commission meeting.

Quorum Requirements: A quorum of Commission members will not be required to conduct the closed portion of the Commission meeting.

Additional Closed Meetings: Once the initial closed portion of the Commission's meeting has concluded, the public portion of the meeting will begin. Upon a motion and a second and a majority vote, the Commission may decide to go back into a closed meeting. If such a decision is made by the Commission, all meeting security requirements previously outlined will apply.

Commission Meetings

Quorum: A majority of the twelve Commission members (i.e., seven members) is required to constitute a quorum. A quorum is the number of members necessary to transact the official business of the Commission. “Presence” shall be defined as either a physical presence or as participation by any other means that allows the Commission member to communicate simultaneously with those members who are present.

Voting Abstentions based on Conflict: For the purpose of determining whether there is a quorum, if a member abstains from voting based on a special conflict of interest (as defined under *Member Duties and Responsibilities*), that member would still be deemed present for purposes of the quorum requirement (Attorney General’s Opinion 75-244; August 29, 1975).

Temporary Absence: “If a member in attendance at a meeting is called away and is unable to return to the meeting, the transcript should reflect the point at which ... [the member] left and - if the remaining members constitute a quorum - the meeting should continue.” If, however, the member is only temporarily absent, and this member is needed to constitute a quorum, the “appropriate procedure would be to recess the meeting until the member can return or, at least, to postpone a vote on any matter before the body until ... [the member’s] return” (Attorney General’s Opinion 74-289; September 20, 1974).

Meeting Notices: Written notice of a meeting of the Commission shall be provided to each member as soon as possible, and at a minimum, except in the event of an emergency meeting, at least seven days prior to the date scheduled. Section 286.011, F.S., requires public meetings to be noticed, and the notice must contain a time certain, a date, and the location of the meeting. If available, an agenda should be provided. If no agenda is available, it is sufficient if the notice summarizes the subject matter to be covered in the public meeting.

Public Access: Any member of the public shall have access to all Commission meetings that do not involve the discussion of trade secrets used in designing and constructing hurricane loss models. That portion of a Commission meeting where a trade secret is addressed is confidential and exempt according to s. 627.0628(3)(f)2, F.S., and thus will not be open to the public.

Agendas: Agendas listing topics planned for discussion shall be furnished to each member prior to the meeting. The agenda is to be used merely as a guide and topics not listed may be raised and discussed and the members may choose not to address an issue or topic listed on the agenda.

Location: Meetings shall be in Tallahassee, Florida, unless special circumstances arise.

Recording: The SBA staff shall be responsible for ensuring that all Commission meetings are recorded. A transcribed record shall be taken for all public portions of Commission meetings and an electronic recording shall be taken for all closed portions of Commission meetings. Commission meeting records shall be maintained by SBA staff in accordance with SBA policies and procedures. The Commission will not record a transcript for any closed portion of a Commission meeting.

Voting Requirement: Except in the case of a special conflict of interest (as defined under *Member Duties and Responsibilities*), no Commission member who is present at any meeting at which an official decision or act is to be taken or adopted by the Commission may abstain from voting (s. 286.012, F.S.).

Designation of an Acting Chair: Depending on the circumstances, the Chair or Vice Chair may temporarily appoint any member to act as Chair in those situations where the physical presence of a Chair is desirable to facilitate conducting the meeting.

Purpose and Conduct of Meetings: The Commission holds eight types of meetings: (1) Committee meetings designed to review and revise the Commission's standards, disclosures, forms, acceptability process, and other sections of the *Report of Activities*, (2) Commission meetings for the purpose of adopting revisions to the standards, disclosures, forms, acceptability process, and other sections of the *Report of Activities*, (3) Commission meetings for the purpose of reviewing model submissions, (4) Commission meetings for reviewing model acceptability, (5) Commission meetings to consider an appeal by a modeling organization if a model is not found to be acceptable by the Commission, (6) planning workshops for the purpose of discussing, studying, and educating Commission members on scientific advances and new developments in the fields of meteorology, engineering, actuarial science, statistics, and computer science, (7) Executive Committee meetings to review and prioritize any ideas, issues, and concepts for consideration by the Commission, and (8) Commission meetings to vote on the recommendations of the Executive Committee. The discussions from the planning workshops may be used in planning for future standards, disclosures, and forms. The meetings to review model acceptability may involve the discussion of modeling organization trade secrets. The Commission shall conduct the portion of a meeting where trade secrets used in the design and construction of the hurricane loss model are discussed as a closed meeting. Each type of meeting is discussed below.

Committee Meetings

Committee meetings are for the purpose of discussing issues, developing standards, completing necessary groundwork, and reaching a consensus among those present so when the Commission meets later to formally adopt the standards and *Report of Activities*, most of the issues can be easily resolved with less detail and finalizing work required. Committee meetings provide for an informal workshop environment where Commission members, Professional Team members, SBA staff, modeling organizations, insurers, regulators, and the general public are encouraged to participate and provide input. A working draft of proposed revisions to the standards, disclosures, forms, acceptability process, and other portions of the *Report of Activities* is created. A public notice is required, but it is not necessary that a quorum be present since all official business requiring a vote will be conducted at Commission meetings.

The role of the Chair of a Committee is to present the draft of proposed standards and other relevant documents with the aid of the Professional Team and SBA staff. The role of the other Committee members is to thoroughly review the proposed draft and provide input and ideas at the Committee meetings. Committee members have the responsibility of preparing in advance and becoming familiar with all the relevant issues. Such members have the responsibility of

reading documents, raising questions, forming opinions, and participating in discussions. The role of the other Commission members is to participate, at their option, in all or various Committee meetings. In this manner the difficult work will be spread among Commission members and specific expertise will be utilized when reviewing and revising standards. It is beneficial for each Commission member to be fully prepared to participate as an active Committee member and provide quality input and discussion at the Committee stage.

Committee meetings are not Commission meetings. Due to quorum requirements, no formal voting shall take place at Committee meetings, but a consensus among Committee members and others participating is desirable. The Committee Chair is expected to report issues and bring work products to the Commission at properly scheduled and noticed Commission meetings. It is possible for a Committee to meet with one Commission member (the Chair of the Committee) and other interested parties (non-Commission members), but such Committee meetings shall be publicly noticed and approved by the Commission Chair. The Committee meeting idea works best when Commission members guide the Committee meetings and there is broad participation by the public, modeling organizations, regulators, or other interested parties. Although Committee meetings can be held with a substantial number of Commission members present, care should be taken to include the public and all interested parties to gain maximum participation and input. Committee Chairs should regularly call upon and solicit input from any and all interested parties present.

The recommended way to conduct a Committee meeting is as follows:

1. Standard
 - a. Each standard should be taken in order and read in its entirety or presented visually to the members.
 - b. The Committee Chair asks if the standard is located in the appropriate grouping of standards or if it should be moved to a more appropriate section.
 - c. The Committee Chair asks if the standard is still relevant, whether it should be eliminated, or if modifications should be made. If modifications are suggested, the Chair should ask for proposed wording, if anything needs to be added, or if anything needs to be deleted in the standard.
 - d. Any proposed changes to the standard are then read and explained.
 - e. The Committee Chair next asks if there are any objections to the proposed changes and if any further changes are needed.
 - f. The Committee Chair asks whether there are wording issues associated with the standard, are there any ambiguities, or are there ways to further clarify the standard by better drafting.
2. Purpose
 - a. The Committee Chair reads or visually presents the purpose of the standard and asks if the purpose is clear and if any changes are needed.
 - b. The Committee Chair asks if there are any objections or comments regarding the wording in the Purpose section.
 - c. The Committee Chair asks if there are any wording or drafting issues associated with the purpose.
3. Disclosures
 - a. The Committee Chair reads or visually presents each disclosure and asks if the disclosure is relevant and located with the appropriate standard.

- b. The Committee Chair asks whether any additions, deletions, or other proposed changes are needed to the disclosures.
 - c. The Committee Chair asks if there are any objections to the proposed changes and if any further changes are needed.
 - d. The Committee Chair asks whether there are wording issues or additional instructions that need to be addressed to clarify the disclosure requirements.
4. Audit
- a. The Committee Chair reads or visually presents the audit requirements and asks if it is clear and will be sufficient to help verify if the modeling organization has met the standard.
 - b. The Committee Chair asks whether any additions, deletions, or other proposed changes are needed to the Audit section.
 - c. The Committee Chair asks if there are any objections to the proposed changes and if any further changes are needed.
 - d. The Committee Chair asks whether there are wording issues or additional instructions that need to be addressed to clarify the audit requirements.
5. Forms
- a. The Committee Chair asks whether the forms are appropriate, relevant, and located in the appropriate grouping of standards.
 - b. The Committee Chair asks if there are any proposed changes suggested for the forms and if additional instructions are needed.
 - c. The Committee Chair asks if there are any objections to the proposed changes or if additional wording changes are needed for clarification.
6. Trade Secret Items
- The Committee will identify trade secret information, documents, and presentation materials that contain potential trade secrets used in the design or construction of the hurricane loss model that the Commission wants the modeling organization to visually display or discuss during the closed portion of a Commission meeting to review models for acceptability.

The meeting of the Acceptability Process Committee will proceed differently, but will follow a similar logical pattern as described above. The Acceptability Process Committee will start by reviewing the “Process for Determination of the Acceptability of a Computer Simulation Model.” All proposed changes will be discussed. Any modifications will be considered. Objections and comments will be solicited from those participating. Finally, any wording or formatting issues will be discussed.

Following the discussion of the acceptability process, the Acceptability Process Committee will take up other various sections of the *Report of Activities* by considering their appropriateness and relevancy, proposed/suggested changes or modifications, any objections, and wording or formatting issues.

As consensus is built and revisions are agreed to, the SBA staff in conjunction with the Professional Team will note the changes/modifications and produce the draft documents that will be distributed in advance of the Commission meetings that will be held for the purpose of adopting the standards and finalizing the *Report of Activities* for the next odd year.

Commission Meetings to Adopt Standards

The Chair of the Commission will open the meeting and ask each Committee Chair, who presided over the revisions to the standards, to comment as to the purpose of each standard and any changes suggested by the Committee under each standard. This will not only include the standard, but the purpose, the disclosures, the audit requirements, and the forms. The Committee Chair along with the Professional Team and SBA staff will discuss and comment on revisions to the standards. The Commission members will ask questions and offer further suggestions if necessary and appropriate. The Chair may also ask for comments from others in attendance including modeling organizations, regulators, insurers, or the general public.

Once the discussion is concluded, the Committee Chair should make a motion that the Commission adopt the standard along with the suggested revisions including those associated with the purpose section, the disclosures, the audit requirements, and the forms. Another Committee member should second the motion. The Commission Chair will then ask if there is any further discussion. The Commission Chair will recognize Commission members for final comments or questions. Once the discussion is completed, the Commission Chair will ask for a roll call vote. Each standard (including its accompanying purpose section, disclosures, audit requirements, and forms) will be voted on separately.

The “Process for Determining the Acceptability of a Computer Simulation Model” will be voted on separately. The Commission Chair will ask the Chair of the Acceptability Process Committee to explain the changes to the acceptability process. Once this is completed and comments are made by the Professional Team and SBA staff, the Committee Chair will make a motion that the Commission adopt the acceptability process as amended. Another Acceptability Process Committee member should second the motion. The Commission Chair will ask if there is any further discussion. After recognizing Commission members for discussion, the Commission Chair will ask for a roll call vote.

The final items to be voted on by the Commission include the remaining sections of the *Report of Activities*. If any of these sections do not change, they can be combined and adopted with one roll call vote. The Acceptability Process Committee will be responsible for these recommendations. The Committee Chair will discuss any changes/modifications and should make a motion to approve each section separately. Another Acceptability Process Committee member should second the motion. The Commission Chair will recognize Commission members for discussion and questions, and then will call for a roll call vote.

As a final consideration, the Commission Chair should consider whether it is appropriate to authorize the SBA staff to make any needed editorial changes consistent with the adopted *Report of Activities*. This would be done by roll call vote after a Commission member makes a motion that is seconded and after discussion.

Once all voting necessary to finalize the *Report of Activities* is completed, the Commission may take up other business or may adjourn.

Commission Meetings to Review Modeling Organization Submissions

The purpose of the meeting to review modeling organization submissions is to identify any “deficiencies” in the submissions, to create a list of “issues” to be addressed by each modeling organization, and to determine whether an “existing” modeling organization will be required to submit Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) prior to the Professional Team on-site review.

Modeling organization submissions must be received by either the March 1 or November 1 deadlines, and the submissions will have been distributed to each Commission member and the Professional Team for their review. The SBA staff will work with the Professional Team to identify any deficiencies or issues. Prior to the meeting, the Commission Chair working with SBA staff and the Professional Team may request that the modeling organization meet with the Commission (in person or by conference call) or provide additional information to clarify the submission.

Deficiency: A deficiency is defined as a lack of required documentation. A list of deficiencies will be created if the submission is incomplete, unclear, or non-responsive. Failure to adequately provide a required written response or the necessary public documentation expected by the Commission in the submission will result in a deficiency. If necessary, the Commission will attempt to further clarify its expectations by providing additional comments or instructions with the deficiency so that the modeling organization is fully aware of what is expected and will have a reasonable opportunity to correct the deficiency. The Commission will determine the appropriate time frame for correcting deficiencies. Failure to correct the deficiency within the time frame specified will result in the termination of the review process. The Commission Chair will have the discretion to extend the time frame for a modeling organization correcting deficiencies if unusual circumstances are involved.

Issue: Issues are related to the operation and theoretical soundness of the model. Issues should not require a modeling organization to submit additional public documentation that is not required of all modeling organizations. Issues should be addressed by the modeling organization with the Professional Team during the on-site review as well as with the Commission when the modeling organization presents the model to the Commission for acceptability. Should the nature of an issue be such that the Commission feels public documentation is needed, then the documentation should be added to the disclosure requirements and required of all modeling organizations. Otherwise, some modeling organizations might be put in an awkward position and vulnerable to making more information about their model public than other modeling organizations thus resulting in a competitive disadvantage. [See Principle #11: *The Commission’s review process of models or methods shall not restrict competition in the catastrophe modeling industry or thwart innovation in that industry.*]

In conducting the meeting to review the modeling organization submissions, the Commission Chair will take up one modeling organization submission at a time as indicated on the agenda for the meeting. The Commission Chair will take up each standard grouping and consider all the responses provided under the standard including the modeling organization’s response to compliance with the standard, the information provided in the disclosures, any response provided to the audit requirements, and the completeness of the forms.

The first point of discussion will relate to submission deficiencies. The SBA staff working with the Professional Team will have provided a report to the Commission members regarding deficiencies that have been identified and that need to be corrected. The Commission will review those deficiencies and add, delete, or modify the list as appropriate. Following a discussion of the deficiencies, the Commission will next discuss the issues identified under each grouping of standards. The SBA staff working with the Professional Team will have provided the Commission members with a list of issues prior to the meeting. The Commission will review those issues associated with each grouping of standards and add, delete, or modify the list as appropriate. The third point of discussion will relate to the requirement of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) for an existing modeling organization. The SBA staff working with the Professional Team will have provided, prior to the meeting, a recommendation to the Commission for requiring a completed Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis). The Commission will determine, based on the recommendation and changes disclosed in the model submission, whether an existing modeling organization will be required to provide Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis).

Upon review of each grouping of standards, the Commission Chair will ask if there is a motion and a second to continue the review process subject to the correction of the deficiencies and to approve the list of issues to be addressed in the review process. The Statistical Standards motion will also include the decision on the requirement of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis). Motions should include a specific time frame for correcting any deficiencies in the submission and if required, a specific time frame for providing a completed Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) prior to the Professional Team on-site review. The modeling organization will be expected to resubmit or amend the original submission as specified by the Commission in the Acceptability Process of the *Report of Activities*. The Commission Chair will call for further discussion. After discussion, the Commission Chair will ask for a roll call vote. The next grouping of standards will then be addressed. At any point, the Commission can determine that the modeling organization has not been responsive to the submission requirements and vote to terminate the review process.

Commission Meetings to Review Models for Acceptability

The first portion of the Commission's meeting to review a model for acceptability will be closed to the public and will involve the discussion of trade secrets used in the design and construction of the hurricane loss model identified in the *Report of Activities* as trade secret items and by the Professional Team during the on-site or additional verification reviews.

At the public meeting to determine the acceptability of a model, once a quorum is present, either in person or by telecommunications, all votes will be by a roll call vote based on the majority vote of those present. No Commission member, who is present at any Commission meeting at which an official decision or act is to be taken or adopted by the Commission, may abstain from voting except when a special conflict of interest exists (s. 286.012, F.S., s. 112.3143, F.S.). For those circumstances in which a standard does not apply to a particular model, the Commission will vote affirmatively that the standard does not apply and such a vote will constitute a determination by the Commission that the standard is not applicable.

The standards will be categorized under six groupings: (1) General Standards, (2) Meteorological Standards, (3) Statistical Standards, (4) Vulnerability Standards, (5) Actuarial Standards, and (6) Computer Standards. The minimum number of vote tallies taken to determine the acceptability of a model would be one for each group of standards. If the Commission determines that the model meets all standards in a grouping, the model is found acceptable with respect to each individual standard in the grouping. Standards with subparts denoted by a notation of A, B, C, etc. are considered one standard. At the request of any Commission member, one or more standards in a grouping may be set aside from the remaining standards in that grouping for a separate vote.

Based upon a motion of any member that is duly seconded, the Commission may review and modify the voting requirements for any model as may be appropriate due to the unique aspects of the model.

At the start of the public portion of the meeting, the Commission Chair will first ask the Professional Team to report on the modeling organization responses to the deficiencies identified in the meeting to review modeling organization submissions. The Commission Chair may entertain discussion from Commission members or the modeling organization. Failure to provide the trade secret information required in the *Report of Activities* and the Professional Team report will result in a deficiency. If the Commission identifies other deficiencies, the Commission may specify a time frame for correction of those deficiencies that may include a review by one or more Professional Team member(s).

The Commission Chair will then call upon the modeling organization to provide an overview presentation as required in the Acceptability Process of the *Report of Activities*. The modeling organization shall make a presentation and Commission members may ask questions during and after the presentation.

The Commission Chair will announce that the Commission is ready to review the model for acceptability. The Commission Chair will ask Commission members their preference for reading the standards, by title or in entirety. The Commission Chair will read the first standard and will call upon the modeling organization to discuss the compliance of the model with the standard. The Commission Chair will next call upon the Professional Team to comment after which the Commission Chair will ask Commission members for questions or comments. If there are none, or after all questions have been responded to, the Commission Chair will then proceed to begin reading the next standard. Once all the standards in a grouping have been presented and discussed, the Commission Chair will ask the Commission members whether there are any standards that need to be carved out and voted on separately. If no response is heard, the Commission Chair will ask for a motion to accept the model under that grouping of standards. A motion will be made and seconded by Commission members at this time. Prior to voting, the Commission Chair will ask if there is any further discussion. If members have questions or comments, they will be recognized. Once the discussion is completed, the Commission Chair will ask for a roll call vote. Any standards carved out will be separately voted on in a roll call vote.

The Commission Chair will then move to the next grouping of standards and begin to read the first standard in the grouping. The review process will follow as indicated in the paragraph above.

The Commission will have completed its determination of the acceptability of the model when it has completed voting on all standards. This does not preclude the Commission from revisiting a previous vote or revising the voting procedure as noted above. Upon conclusion of voting on all the standards, the Commission Chair will instruct SBA staff to tally the votes. The SBA staff member will indicate whether the model has been found acceptable by noting that the Commission does or does not find the model to have met all the standards. If the Commission finds the model acceptable, the Commission Chair will indicate to the modeling organization that the modeling organization will receive a letter as provided in the Acceptability Process of the *Report of Activities*.

The voting procedure can be changed only if approved by the Commission members, given a quorum is present. This will require a motion, a second, and approval of a majority by roll call vote.

Commission Meetings to Consider an Appeal by a Modeling Organization if a Model is not Found to be Acceptable by the Commission

If a model fails to meet one or more standards and is not found to be acceptable by the Commission, the modeling organization may file an appeal with the Commission and request a meeting with the Commission in order to provide additional information and data to the Commission to justify that the model complies with the Commission's standards and other requirements. The appeal process is specified in the Acceptability Process of the *Report of Activities*.

The purpose of the meeting to consider an appeal by a modeling organization is to review the appeal documentation and determine whether or not to reconsider the model.

The Commission Chair will call upon the modeling organization to provide a presentation which would include reasons and justification for reconsideration. Commission members may ask questions during and after the presentation. After discussion, the Commission Chair will ask for a motion to reconsider the model. A motion will be made and seconded by Commission members. Prior to voting, the Commission Chair will ask if there is any further discussion. Once discussion is completed, the Commission Chair will ask for a roll call vote.

If the motion to reconsider the model is successfully approved by a majority vote, the Commission shall then determine if additional data and information is necessary prior to reconsideration of the model. The Commission may formulate additional questions and request additional data and information to be responded to by the modeling organization. Such questions, data, and information may include proprietary information, and if so, may be addressed by the modeling organization in a closed session if requested by the modeling organization. If additional data and information is necessary for reconsideration of the model, the Commission questions, data, and information request shall be provided to the modeling organization in a letter from the Commission Chair no later than ten days after the meeting to consider the appeal request. The Commission may proceed with scheduling a meeting with the modeling organization for reconsideration of the model.

If the Commission does not specify any follow up questions or identify any additional data or information needed, the Commission may proceed with the reconsideration of the model. The Commission shall then determine which standards should be reconsidered. This may include only the standards that were previously not found acceptable or it may include other standards that have come into question as a result of new information and data which cast doubt as to the accuracy or reliability of the model. The Commission shall vote on which standard or standards to be reconsidered prior to reconsideration of the model. The modeling organization may request more time to prepare for reconsideration if it feels that the nature of the review has become more complex and that it needs additional resources, time, and data to respond.

In reconsidering an earlier decision regarding a standard or standards, the Commission shall be guided by new information and data which was not previously provided by the modeling organization. Each standard will be discussed and voted upon separately in a roll call vote. The Commission Chair will read the title of the first standard being reconsidered and will call upon the modeling organization to present new information and data and to discuss the compliance of the model with the standard. The Commission Chair may call upon the Professional Team to comment after which the Commission Chair will ask Commission members for questions or comments. The Commission Chair will ask for a motion as to whether the model meets the standard under reconsideration. A motion will be made and seconded by Commission members at this time. Prior to voting, the Commission Chair will ask if there is any further discussion. If members have questions or comments, they will be recognized. Once the discussion is completed, the Commission Chair will ask for a roll call vote.

The Commission Chair will then move to the next standard being reconsidered, and the review process will follow as indicated in the paragraph above. The Commission will have completed its reconsideration of acceptability of the model when it has completed voting on all standards being reconsidered. This does not preclude the Commission from revisiting a previous vote on reconsideration of a standard or revising the voting procedure as noted above. Upon conclusion of voting on all standards being reconsidered, the Commission Chair will instruct SBA staff to tally the votes. The SBA staff member will indicate whether the model has been found acceptable by noting that the Commission does or does not find the model to have met all the standards being reconsidered. If the Commission finds the model acceptable under the standards reconsidered, the Commission Chair will indicate to the modeling organization that the modeling organization will receive a letter as provided in the Acceptability Process of the *Report of Activities*.

The voting and meeting procedure can be changed only if approved by the Commission members, given a quorum is present. This will require a motion, a second, and approval of a majority by roll call vote.

Planning Workshops

Planning workshops are for the purpose of discussing, studying, and educating Commission members on new scientific developments and advances in the fields of meteorology, statistics, engineering, actuarial science, and computer science. The discussions from the planning workshops will be instrumental in planning for future standards, disclosures, and forms.

The planning workshops will be duly noticed and may require a quorum so that an official vote may be taken on actions resulting from the ideas presented and discussed at the workshop.

The Commission Chair will call the meeting to order and will introduce the ideas for discussion as indicated on the meeting agenda and will solicit any other ideas for discussion from Commission members. The ideas introduced will be discussed, prioritized, and evaluated by the Commission. Included in the discussions will be budget considerations, if any, and further study on the ideas if needed.

Executive Committee Meetings

The Executive Committee's role will be to review any ideas, issues, and concepts presented at prior Commission meetings, Committee meetings, or workshops. The Executive Committee will discuss, prioritize, and evaluate various ideas, issues, and concepts. The Executive Committee's goal will be to establish a priority for dealing with various ideas, issues, and concepts as well as to narrow or limit the scope of ideas, issues, and concepts for consideration by the Commission prior to commencement of Committee meetings. The work product of the Executive Committee shall serve as a recommendation to the Committee Chairs. The Committee Chairs should be guided by the Executive Committee's recommendations, but they may decide to re-prioritize or expand or limit the scope of its recommendations depending on the nature of the circumstances. All Committee Chairs should be mindful of the time frames and focus the discussion of all Commission members and interested parties on amending the prior *Report of Activities*.

The work of the Executive Committee is designed to focus the Commission members on a list of changes to the prior *Report of Activities* that are feasible given the time constraints during each biennial cycle for reviewing the Commission standards and various procedures. The Committee Chairs shall suggest language to amend the prior *Report of Activities* in order to implement changes.

The Executive Committee shall first consider proposals for changing the Acceptability Process including other changes that are not directly related to standards, disclosures, forms, or audit requirements. The changes to the standards, disclosures, forms, or audit requirements will then be taken up in whatever order determined appropriate by the Chair under the General Standards, the Meteorological Standards, the Statistical Standards, the Vulnerability Standards, the Actuarial Standards, and the Computer Standards.

The Executive Committee shall draft a report of their recommended priorities to be distributed to Commission members. The Commission shall hold a meeting to vote on the recommendations of the Executive Committee. This will allow for Commission member discussion and debate on the recommendations so as to result in clear priorities for the Commission.

Outside Party Input Regarding Standards, Disclosures, Audit Requirements, Forms, or Other Procedures or Processes Adopted by the Commission

From time to time, parties other than Commission members, Professional Team members, and SBA staff assigned to the Commission have made recommendations for the Commission to

consider. For the Commission to fully and adequately consider input from outside parties, the following process and organizational framework is established for reviewing such input.

The Commission has a clearly defined statutory responsibility to act as a “panel of experts to provide the most actuarially sophisticated guidelines and standards for projection of hurricane losses possible, given the current state of actuarial science.” The Commission’s role is also narrowly defined as to its scope and purpose. As such, input provided by outside parties shall be considered by the Commission at its sole discretion. Subjects that go beyond the purview of the Commission jurisdiction will be rejected without consideration based on a decision by the Commission Chair. The Commission Chair may bring the matter to a vote by the Commission.

In order to enable the Commission and the appropriate Committees to evaluate recommended changes, the Commission requires that each recommendation be in the form of an amendment to specific language in the standard, disclosure, audit requirement, form, or previously adopted process or procedure. The specific amendatory language must be accompanied by a brief statement of the problem being addressed by the amendment and an explanation of how the amendment solves the problem. The problem statement, explanation, and amendatory language must be received by the Commission at least ten business days prior to the Committee or Commission meeting at which the outside party wishes the amendment to be considered.

Consideration of any proposed amendment is at the discretion of the Committee Chair when the input is provided for Committee consideration. The proposed amendment may later be accepted or rejected for review by the Commission Chair prior to such input being brought before the Commission for a vote.

While comments and recommendations of a more general nature may be provided by outside parties, such recommendations must be in the form described above in order to be considered at a Committee or Commission meeting called for the purpose of adopting or revising standards, disclosures, audit requirements, forms, or changes to previously adopted processes or procedures. Nothing in this paragraph prevents a Commission member from proposing alternative language to address an issue raised by an outside party.

Any topics for general discussion should be addressed to the Commission Chair who will decide, in his/her sole discretion, whether the topic merits discussion by Commission members, when and how the topic will be discussed, and whether or not to accept public comment. The Commission Chair should reject any topic for discussion that is beyond the scope of the Commission’s purview.

Problem Statement: A brief statement of the problem being addressed should be provided with all proposed changes as well as amendatory language.

Explanation: The explanation should classify the change as general, technical, or editorial and include justification for the change.

Amendatory Language: Proposed changes and amendatory language will assure that all recommended changes to standards, disclosures, audit requirements, forms, and previously adopted processes and procedures suggested by outside parties are in a form that allows the Commission and its Committee structure to give appropriate consideration to the substance of a

particular proposal with a minimum of time spent resolving ambiguities, drafting questions, and similar issues.

This framework does not restrict the scope of proposals and allows outside parties the flexibility to present the arguments for their proposal in whatever form and at whatever length they desire.

Budget Consideration

All new projects that have a fiscal impact should be identified prior to January 1 of the calendar year so that appropriate funding can be obtained through the SBA's budgetary review process.

All new projects will consist of a proposal, an estimated cost, and a time frame for completion. The Commission will vote on all new proposals for projects. The FHCF will include in its budget the funding for on-going projects and anticipate the potential for new model submissions or any fiscal impact that changes to the acceptability process or the standards might have on the Commission's budget. The Commission's budget is subject to approval by the SBA Trustees for the appropriate fiscal year.

Sunshine Law

Section 286.011, F.S., aka "The Sunshine Law" or "open meeting law" applies to the Commission.

Scope of the Sunshine Law: In any place where two or more members of the Commission are present, there is the potential for violating the Sunshine Law.

Any communication, whether in person, by telephone, computer, etc., concerning any information on which *foreseeable action* may be taken by the Commission is a "meeting" that must meet the requirements of Florida's Sunshine Law if the communication takes place between two or more Commission members except as provided in s. 627.0628(3)(e), F.S.

Basic Requirements for Public Meetings: All meetings subject to the Sunshine Law must be –

- Open to the public;
- Noticed;
- Recorded by a court reporter and minutes preserved. The official minutes of the Commission will consist of a verbatim transcript unless special circumstances arise. In addition, SBA staff may prepare a summary of the meeting that will be added to the transcript and together will comprise the minutes of the meeting.

The SBA staff ensures that all scheduled public meetings of the Commission are filed for public notice in the Florida Administrative Register and a transcript is taken and preserved.

Trade Secret Violations: s. 688.002, F.S., defines misappropriation as "disclosure or use of a trade secret of another without express or implied consent by a person who at the time of disclosure or use, knew or had reason to know that her or his knowledge of the trade secret was acquired under circumstances giving rise to a duty to maintain its secrecy or limit its use."

Section 688.004, F.S., provides for damages as a result of a trade secret violation, “a complainant is entitled to recover damages for misappropriation. Damages can include both the actual loss caused by misappropriation and the unjust enrichment caused by misappropriation that is not taken into account in computing actual loss.”

If a trade secret also meets the definition of a trade secret in s. 812.081, F.S., the following penalty provided in s. 812.081, F.S., for violating the confidentiality of trade secrets could still apply:

“(2) Any person who, with intent to deprive or withhold from the owner thereof the control of a trade secret, or with an intent to appropriate a trade secret to his or her own use or to the use of another, steals or embezzles an article representing a trade secret or without authority makes or causes to be made a copy of an article representing a trade secret is guilty of a felony of the third degree, punishable as provided in s. 775.082 or s. 775.083.

(3) In a prosecution for a violation of the provisions of this section, it is no defense that the person so charged returned or intended to return the article so stolen, embezzled, or copied.”

IV. FINDINGS OF THE COMMISSION

FINDINGS OF THE COMMISSION

Concerning Model Accuracy and Reliability

Background

Section 627.0628(3)(a), (b), and (e), F.S., instructs the Commission to adopt findings from time to time as to the accuracy or reliability of standards and models, among other things. This section also states that the Commission shall adopt revisions to previously adopted actuarial methods, principles, standards, models, or output ranges every odd year. The following findings address the accuracy or reliability of the standards that the Commission has adopted since 1996 and the accuracy or reliability of the computer simulation models that the Commission has reviewed. The Commission thus far has reviewed computer simulation models exclusively because these constitute the only widely accepted approach to estimate residential loss costs and probable maximum loss levels.

The Commission finds that the computer simulation models that it has reviewed are stochastic forecasting models. This means that future hurricane events are stochastically generated and the associated loss costs are accumulated and probable maximum loss calculations can be made using the model with the consideration of an insurer's individual or unique exposure data. By generating a sufficient body of hypothetical future events, the sampling uncertainty in the output ranges owing to the random variate generation process becomes negligible. The Commission finds that the accepted models produce accurate or reliable modeled loss costs and probable maximum loss levels for the entire state of Florida given the data and research currently available. Loss costs and probable maximum loss levels based on these models are based on actuarially sound and theoretically appropriate techniques that also incorporate scientific evidence, findings, and principles from the areas of meteorology, engineering, statistics, and computer science.

Accurate and Reliable – Defined

The Commission finds that the computer simulation models that have been reviewed by the Commission and found acceptable include appropriate model representations to simulate hurricanes and the induced damage on residential property in Florida. The basic features of the model construction are reflected in the six sections of standards established and refined since June of 1996:

- General Standards reflecting the professional status of the model designers and testers and generic aspects of the model;
- Meteorological Standards covering all aspects of this infrequent weather phenomenon;
- Statistical Standards addressing the statistical foundation of the model and the sensitivity and uncertainty assessment of model outputs as a function of model inputs;
- Vulnerability Standards assessing the impact of the hurricane winds on residential property;
- Actuarial Standards assessing the damage impact in insurance terms;

- Computer Standards providing the overall design, construction, and execution of the model.

The Commission finds and recognizes that the scientific fields underlying loss projection models continue to evolve providing further insights into property damage and insurance implications. As a direct consequence, the Commission reviews and revises the standards comprising its *Report of Activities* every odd year. Every odd year is defined as every year ending in an odd number, i.e., 2009, 2011, 2013, 2015, 2017, etc. The Commission finds that the standards adopted every odd year represent the current state of actuarial science regarding computer simulation modeling for purposes of producing loss costs and probable maximum loss levels for residential property in Florida that are accurate and reliable.

The words “accurate” and “reliable” are used in s. 627.0628, F.S., but are not defined therein. In the context of computer simulation modeling, “accurate” means that the models meet the standards that have been developed to assure scientifically acceptable loss cost projections and probable maximum loss levels. However, “accurate” cannot necessarily mean that a model conforms exactly to known facts since that contradicts the nature of the modeling process. “Reliable” is defined for computer simulation models as meaning that the model will consistently produce statistically similar results upon repeated use without inherent or known bias.

FINDINGS OF THE COMMISSION

Concerning Trade Secrets

The Commission finds the following with respect to Principle #9 (*The trade secret aspects of models or methods being reviewed by the Commission shall be protected.*):

1. the organizations that produce a computer simulation model may have trade secrets regarding the design and construction of that model;
2. the modeling organizations have been unwilling to reveal those trade secrets to the Commission in the context of the public meetings that the Commission holds because their competitors are part of the audience or can get a copy of the publicly available transcript of the meeting;
3. the modeling organizations have been willing to reveal all of their trade secrets if that information can remain confidential and within their control;
4. since that trade secret information would become publicly available in the context of a meeting in the “Sunshine,” the Commission has authorized:
 - a. a Professional Team to review the models on-site on behalf of the Commission,
 - b. on-site visits to the modeling organizations by Commission members,
 - c. closed meetings for the purpose of discussing trade secrets;
5. the law allows an exception from the public records law for trade secrets used in the design and construction of hurricane loss models;
6. the Commission may require that the modeling organization provide certain documents for direct review by Commission members or the modeling organization may voluntarily provide documents containing trade secrets for the Commission’s review;
7. the law allows for the discussion of trade secrets to be exempt from public meeting requirements.

V. PROCESS FOR DETERMINING THE ACCEPTABILITY OF A COMPUTER SIMULATION MODEL

PROCESS FOR DETERMINING THE ACCEPTABILITY OF A COMPUTER SIMULATION MODEL

This section specifies the Commission's process for the determination of acceptability of a computer simulation model (model). The Commission has determined that prior to November 1 of every odd year, it will adopt new standards, revise existing standards, and if necessary, revise this process. The effective date of new or revised standards will be November 1 unless otherwise specified by the Commission. The standards and procedures will be published in the *Report of Activities as of November 1, 2013*, and will not be scheduled for change until 2015.

The Commission has determined that "significant changes" to the standards or to the model are those that either change or have potential to change the loss costs or probable maximum loss levels. On the other hand, any minor revisions, changes to the standards, or any changes to the model by the modeling organization that do not result in changes to loss costs or probable maximum loss levels are not considered significant. The Commission may determine in its judgment whether a change is significant.

The Commission has determined that any modeling organization that desires to have a computer simulation model reviewed for compliance with the standards adopted by the Commission shall notify the Commission in accordance with the requirements set out below by either March 1 or November 1 of the even year following the adoption of each odd year's standards.

The Commission has further determined that the period between the effective date of new and revised standards and March 1 or November 1 of the following year (the deadline for notification by the modeling organization) is a reasonable amount of time for any modeling organization to comply with the standards adopted by the Commission. If the Commission determines that this time frame is not sufficient, based on the nature of the changes to the standards or based on other circumstances that might necessitate a longer period of time for compliance, then the Commission will adjust this period of time accordingly. If requested by a modeling organization, the Chair shall have the authority to grant a reasonable extension should the Chair determine that an emergency or unusual situation exists that warrants an extension and is determined to be beyond the control of the modeling organization.

I. Scheduling

The following is an anticipated schedule:

June 2013	Commission workshop
June 2013	Executive Committee meeting
August 2013	Committee meetings
September 2013	Adopt 2013 Standards and <i>Report of Activities</i>
November 1, 2013	2013 <i>Report of Activities</i> published
March 1, 2014	First deadline for notification by modeling organization
March – April 2014	Commission meeting to review submissions
April – May 2014	On-site reviews
May – June 2014	Commission meetings to review models for acceptability under 2013 Standards
November 1, 2014	Second deadline for notification by modeling organization
December 2014	Commission meeting to review submissions
January – April 2015	On-site reviews
April – May 2015	Additional Verification Reviews, if necessary
April – June 2015	Commission meetings to review models for acceptability under 2013 Standards

The Commission will endeavor to expedite the review of a model if the Professional Team is able to verify all standards during the initial on-site review.

II. Notification Requirements

An “existing” organization is defined as an organization whose model was accepted by the Commission under the previous set of standards. All other modeling organizations are considered as “new.”

A. Notification of Readiness for Review. Any modeling organization desiring to have its model reviewed for acceptability by the Commission shall notify the Chair of the Commission in writing by either March 1 or November 1, 2014, that the organization is prepared for review. The notification shall consist of (1) a letter to the Commission; (2) a summary statement of compliance with each individual standard; (3) all required disclosure and form information; and (4) a completed Model Submission Checklist.

Notification to the Commission shall include:

1. A reference to the signed Expert Certification Forms G-1 (General Standards), G-2 (Meteorological Standards), G-3 (Statistical Standards), G-4 (Vulnerability

- Standards), G-5 (Actuarial Standards), G-6 (Computer Standards), and the Editorial Certification Form G-7, a statement that professionals having credentials and/or experience in the areas of meteorology, statistics, engineering, actuarial science, and computer science have reviewed the model for compliance with the standards, and that the model is ready to be reviewed by the Professional Team. Any caveats to the certifications will be noted in the letter and accompanied by a complete explanation.
2. A summary statement of compliance with each standard and the data and analyses required in the disclosures and forms. For existing modeling organizations, the material shall be updated as appropriate to reflect compliance with the new or revised standards even though the modeling organization submitted this material as part of a determination of acceptability under the previous set of standards.
 3. A general description of any trade secret information that the modeling organization intends to present to the Professional Team.
 4. Seven (7) bound copies (duplexed) and a link e-mailed to SBA staff where all documentation can be downloaded. Submission documentation shall be provided in the following manner:
 - a. Form M-1 (Annual Occurrence Rates), Form M-3 (Radius of Maximum Winds and Radii of Standard Wind Thresholds), Form V-2 (Mitigation Measures – Range of Changes in Damage), Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), Form A-2 (Base Hurricane Storm Set Statewide Losses), Form A-3A (2004 Hurricane Season Losses, 2007 FHCF Exposure Data), Form A-3B (2004 Hurricane Season Losses, 2012 FHCF Exposure Data), Form A-4A (Output Ranges, 2007 FHCF Exposure Data), Form A-4B (Output Ranges, 2012 FHCF Exposure Data), Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data), Form A-7 (Percentage Change in Logical Relationship to Risk), and Form A-8 (Probable Maximum Loss for Florida) shall be provided in Excel format;
 - b. Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) shall be provided in ASCII and PDF format, if required;
 - c. The remaining portions of the submission shall be provided in PDF format;
 - d. All data file names shall include the abbreviated name of the modeling organization, the standards year, and the form name (when applicable);
 - e. The PDF submission files shall support highlighting and hyperlinking, and shall be bookmarked by standard, form, and section.
 5. Format of the Submission:
 - a. Table of Contents shall be included;

- b. Materials submitted shall be consecutively numbered from the first page (including cover) using a single numbering system from the beginning to the end of the submission and shall include the date and time in the footnote;
- c. All tables, graphs, and other non-text items shall be consecutively numbered using whole numbers, specifically listed in the Table of Contents, and clearly labeled with abbreviations defined;
- d. State the standard, disclosure, or form in *italics* and give the response in non-italics. **The Purpose and Audit portion should not be restated.** The modeling organization response shall include a statement in support of compliance following each standard. The response to the standard shall explain how the model meets the requirements of the standard by including (1) a statement in support of compliance with the standard, and if applicable (2) a reference to a disclosure(s), and/or (3) a general description of trade secret information that will be shown to the Professional Team during the on-site review and how it supports compliance with the standard.

The Disclosure section of each standard is not designed to require trade secret information. Therefore, the response to a disclosure shall not contain a statement similar to “will be shown to the Professional Team” unless a response to the disclosure has been provided and additional test results and documentation will be available for the Professional Team during the on-site review.

If a standard or disclosure has multiple sections, respond to each section separately;

- e. Graphs shall be accompanied by legends and labels for all elements:
 - 1. Individual elements shall be clearly distinguishable, whether presented in original or copy form;
 - 2. Maps will use three colors – blue, white, and red, including shades of blue and red, with dark blue and dark red designating the lowest and highest quantities, respectively. The color legend and associated map shall use the maximum and minimum values as the range and shall be comprised of an appropriate number of intervals, with at least seven, to provide readability and no interval shall contain both negative and positive values. Relevant geographic boundaries (e.g., counties, ZIP Codes) shall be shown in black. The maximum and minimum values and their locations shall be plotted on the maps;
 - 3. For data indexed by latitude and longitude, by county or by ZIP Code, a map with superimposed county and ZIP Code boundaries shall be produced. Additional map specifications will be indicated on individual form instructions;
- f. Blank cells shall be used to signify no exposure;

- g. All diagrams (e.g., flowcharts), including their internal components, shall be completely labeled and based on a diagram standard (e.g., business process model and notation, BPMN);
 - h. All units of measurement for model inputs and outputs shall be clearly identified;
 - i. All model outputs of length, windspeed, and pressure shall be in units of statute miles, statute miles per hour, and millibars, respectively;
 - j. Unless otherwise specified, windfields generated by the model shall be used for completing relevant forms and tables in the submission;
 - k. All forms (with the exception of Forms V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item), A-6 (Logical Relationship to Risk, Trade Secret item), and S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)) shall be included in an Appendix. A link to the location of the form shall be provided in the corresponding disclosure;
 - l. If used, acronyms shall be defined on their first use in the submission;
 - m. All column headings shall be shown and repeated at the top of each subsequent page for forms and tables.
6. The modeling organization should contact SBA staff for any needed clarification of submission instructions, especially if the instructions necessitate additional assumptions.
 7. All modifications, adjustments, assumptions, or other criteria that are included in producing the information required by the Commission in the submission shall be disclosed and will be reviewed.

B. Revisions to the Standards or the Model – Not Significant. If the Commission does not revise any standards or makes only minor revisions to some standards so that existing models would otherwise be in compliance with all the standards, and the modeling organization subsequently notifies the Commission in writing that there have been no significant changes to the model previously determined acceptable, then the Commission will meet and review the modeling organization’s letter and any other documentation provided and determine whether the model will be considered acceptable for an additional two years, whether an on-site review by the Professional Team is warranted, and whether a meeting with the Commission is warranted.

C. Revisions to the Standards or the Model – Significant. If the Commission makes significant changes to any existing standards and/or adopts new standards so that a model already determined to be acceptable is still in compliance with some, but not necessarily all of the standards, then the modeling organization will inform the Commission in writing as to whether it believes it is still in compliance with the standards that have been substantially revised or are new. If an existing modeling organization makes significant changes to the version of the model previously accepted by the Commission, then at the

time it notifies the Commission that it is ready to have its model reviewed for acceptability, the modeling organization shall notify the Commission in writing of the change(s) and describe the magnitude of the change(s). The Commission will then meet and review the modeling organization's notification and any other documentation provided and determine whether the model is acceptable for an additional two years or whether an on-site review by the Professional Team is warranted or whether an on-site review is not necessary but that additional documentation must be provided which will then be reviewed at a Commission meeting. The Commission will not review changes made to a previously accepted version of a model at any time other than after the next March 1 or November 1 notification date.

D. Notification of Unusual Circumstances. The modeling organization shall notify the Chair of the Commission in writing, as soon as possible, of any unusual situations that may impact the model submission.

III. Review of the Readiness Notification

Once modeling organization submissions are received by either the March 1 or November 1 deadline, the Commission will hold a meeting to review the submissions as discussed under the Commission Structure section of this *Report of Activities*.

Prior to the Professional Team's on-site review and in accordance with the time frame specified by the Commission, the modeling organization shall submit corrections for the deficiencies identified during this meeting and Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) if required in electronic format via e-mail correspondence to SBA staff. Only revised pages and forms should be provided with revision marks as specified under **V. Submission Revisions**. If more than ten pages are impacted by the corrections to the deficiencies, then an entire book shall be submitted (seven bound copies (duplexed) and a complete electronic version). All revised file names shall include the revision date, the abbreviated name of the modeling organization, the standards year, and the form name (when applicable) in the file name.

If, in addition to responding to the deficiencies specifically, the modeling organization opts to make further minor corrections elsewhere in their submission, it may do so but should provide an annotated list of these additional changes along with the corrections to the deficiencies.

Failure of the modeling organization to correct any deficiencies or to submit Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) if required within the time frame specified will result in the termination of the review process. The modeling organization will be notified in writing that the review process has been terminated. Upon termination of the review process, the modeling organization shall be required to wait until after the next revision or review of the standards before requesting the Commission to review its model.

In the event that a modeling organization realizes the initial submission has material errors and needs revision prior to the scheduled on-site review, the modeling organization shall immediately notify the Chair of the Commission in writing. The notification shall detail the nature of the errors and changes to the model, why it occurred, what is needed or has been done to correct the problem, the time frame needed for making the corrections, and any other relevant documentation necessary to describe both the errors and the corrections.

The Commission Chair shall (1) review the notification and inform the Commission members as soon as possible, and (2) assess, with at least three members of the Professional Team, the severity of the error and determine whether to postpone the on-site review pending consideration of potential deficiencies and the overall schedule of on-site reviews.

If it is determined to proceed with the originally scheduled on-site review, the modeling organization shall submit revised documentation no less than ten days prior to the scheduled on-site review of the Professional Team. If the modeling organization cannot correct the problems and submit revised documentation ten days prior to the scheduled on-site review of the Professional Team, then all associated standards will not be verified during the initial on-site review.

IV. Professional Team On-Site Review

If a determination has been made that a new modeling organization is ready for an on-site review or that an on-site review is necessary for an existing modeling organization, SBA staff will schedule the on-site review of the Professional Team as discussed under the On-Site Review section of this *Report of Activities*.

There are two possible outcomes of the on-site review regarding auditing for compliance with the standards, disclosures, forms, and trade secret items.

1. The Professional Team determines that, in its opinion, the model is likely to comply with the standards, disclosures, and forms, and so reports to the Commission. The trade secret items to be presented during the closed meeting portion of the Commission meeting to review models for acceptability shall be presented to the Professional Team for review.
2. The Professional Team determines that, in its opinion, the model is unlikely to comply with the requirements in the disclosures, forms, and trade secret items or with one or more standards.
 - a. The Professional Team may react to possible corrections proposed by the modeling organization but will not tell the modeling organization how to correct the non-compliance. If the problems can be remedied while the Professional Team is on-site, the Professional Team will review the corrective actions taken, including revisions to the original March 1 or November 1 submission, before determining verification of a standard.

- b. If the problems cannot be corrected while the Professional Team is on-site, then the modeling organization will have seven days from the final day of the on-site review to notify the Chair in writing that it will be ready for an additional verification review within thirty days of the notification. The modeling organization shall submit all revised documentation as specified under **V. Submission Revisions**.

The SBA staff will assemble the Professional Team or an appropriate subset of the Professional Team for only one additional verification review to ensure that the corrections have been incorporated into the current, running version of the model.

If any problem necessitates the re-generation of the output ranges, the modeling organization shall submit revised output ranges to be received by the Commission no less than ten days prior to the initial date of the on-site review. If this is not the case, then Standard A-6 (Loss Output) will not be verified during the initial on-site review.

In the event that (1) Form A-4A (Output Ranges, 2007 FHCF Exposure Data) was modified after the initial submission and prior to the on-site review, or (2) an additional verification review is required and Form A-4A (Output Ranges, 2007 FHCF Exposure Data) must be re-generated, the modeling organization shall provide an additional version of Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data) using the initial submission of Form A-4A (Output Ranges, 2007 FHCF Exposure Data) as the baseline for computing the percentage changes.

In the event that (1) Form A-4B (Output Ranges, 2012 FHCF Exposure Data) was modified after the initial submission and prior to the on-site review, or (2) an additional verification review is required and Form A-4B (Output Ranges, 2012 FHCF Exposure Data) must be re-generated, the modeling organization shall provide an additional version of Form A-5 (Percentage Change in Output Ranges) using the initial submission of Form A-4B (Output Ranges, 2012 FHCF Exposure Data) as the baseline for computing the percentage changes.

In the event that (1) Form A-6 (Logical Relationship to Risk, Trade Secret item) was modified after the initial submission and prior to the on-site review, or (2) an additional verification review is required and Form A-6 (Logical Relationship to Risk, Trade Secret item) must be re-generated, the modeling organization shall provide an additional version of Form A-7 (Percentage Change in Logical Relationship to Risk) using the initial submission of Form A-6 (Logical Relationship to Risk, Trade Secret item) as the baseline for computing the percentage changes.

- c. If the modeling organization disagrees with the Professional Team as to likelihood of compliance, the modeling organization has two options: (1) it can proceed to the scheduled Commission meeting to review models for acceptability

under the 2013 Standards and present its arguments to the Commission to determine acceptability, or (2) it can withdraw its request for review. Such a withdrawal will result in the modeling organization waiting until after the next revision or review of the standards before requesting the Commission review its model.

V. Submission Revisions

Revised documentation shall include the revision date on the submission cover page and the Model Identification page. All revised file names submitted shall include the revision date, the abbreviated name of the modeling organization, the standards year, and the form name (when applicable) in the file name.

Revisions shall be noted with revision marks, i.e., words stricken are deletions (~~deletions~~) and words underlined are additions (additions). If revision marks are provided in color, material deleted and stricken shall be in red, and material added and underlined shall be in blue.

The Professional Team and the Commission Chair will review the new material upon receipt for deficiencies. The Commission Chair will notify the modeling organization of the deficiencies and the time frame for correction. An additional verification review will not be scheduled until all deficiencies have been addressed. The Professional Team may provide to SBA staff a second pre-visit letter to be sent to the modeling organization outlining specific issues to be addressed during the additional verification review.

Complete documentation, including a link where the complete documentation can be downloaded, shall be received no less than ten days prior to the Commission meeting to review the model for acceptability.

A note will be posted on the Commission website with instructions for obtaining submission documents. Final submission documents for a model that has been found acceptable by the Commission will be posted on the Commission website (www.sbafla.com/methodology).

If an additional verification review is requested, complete documentation, including a link where the complete documentation can be downloaded, shall be received within thirty days of the request.

The modeling organization shall provide a link where all complete documentation with and without revision marks can be downloaded. If more than ten (10) pages are revised, seven (7) bound copies (duplexed) of all complete documentation with revision marks for all revisions made to the original March 1 or November 1 submission shall be provided. If ten (10) pages or fewer (exclusive of the forms in the Appendix) are revised, only seven (7) bound copies (duplexed) of the revised pages and forms (if revised) shall be submitted. The format of the revised documentation shall be as specified under **II. Notification Requirements, A. Notification of Readiness for Review, 4 and 5.**

VI. Review by the Commission

- A. **General Review of a Modeling Organization.** For any modeling organization seeking the Commission's determination of acceptability, the Commission may request a meeting with the modeling organization prior to the Commission's review of the modeling organization's compliance with the standards. The meeting may provide a general discussion about the model or its readiness for review and will also give the Commission and the modeling organization an opportunity to address any other issues. This meeting may be conducted concurrently with the meeting to determine acceptability. If trade secrets used in the design and construction of the hurricane loss model are anticipated to be discussed, such discussions will be in a closed meeting.
- B. **Meeting to Determine Acceptability.** The Commission will meet at a properly noticed public meeting to determine the acceptability of a new or existing model once the modeling organization has provided all required material and the Professional Team has concluded its on-site review or any additional verification review. If the Commission Chair determines that more preparation time is needed by Commission members, he/she may reschedule the meeting date to review a model for acceptability, taking into consideration public notice requirements, the availability of a quorum of Commission members, the availability of a meeting room, and the availability of the particular modeling organization.

All materials shall be reviewed by the Professional Team prior to presentation to the Commission.

If the Commission determines that meeting one standard makes it impossible to meet a second standard, the conflict will be resolved by the Commission, and the Commission will determine which standard will prevail. If at the meeting a unique or unusual situation arises, the Commission will determine the appropriate course of action to handle that situation, using its sound discretion and adhering to the legislative findings and intent as expressed in s. 627.0628(1), F.S.

Each organization's model will be reviewed independently of any other organization's model previously accepted or presently applying for review.

Trade secrets used in the design and construction of the hurricane loss model shall be discussed during a closed meeting prior to the Commission voting on the acceptability of the model. No voting regarding the acceptability of a model will occur during a closed meeting.

- C. **Modeling Organization Presentation.** All modeling organizations shall make a presentation to the Commission with respect to the model as used for residential ratemaking purposes in Florida. The modeling organization presentation is for the purpose of helping the Commission understand outstanding issues as well as how the modeling organization has resolved various issues and to explain the basis as to how the model meets the standards. Various issues may relate to:

1. Informational needs of the Commission as provided in the disclosures and forms;
2. The theoretical soundness of the model;
3. Use of reasonable assumptions;
4. Other related aspects dealing with accuracy or reliability.

A new modeling organization is expected to give a detailed overview presentation to the Commission explaining how the model is designed to be theoretically sound and meets the criteria of being accurate and reliable.

An existing modeling organization is expected to present a general overview of the model (10-15 minutes). This presentation should concentrate on the theoretical basis for the model and highlight the measures taken to ensure the model is accurate and reliable. Then the presentation should focus on changes, including output ranges, from the previously accepted model and the effect those changes have on loss costs and probable maximum loss levels.

Closed Meeting Portion

During the closed meeting where trade secrets used in the design and construction of the hurricane loss model are discussed, the modeling organization shall present Form V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item) and Form A-6 (Logical Relationship to Risk, Trade Secret item) as well as trade secret items identified by the Professional Team during the on-site and additional verification reviews to be shown to the Commission. The trade secret items identified will be documented in the Professional Team report to the Commission.

All material presented shall be complete, e.g., all axes on graphs labeled. The presentation shall use a medium that is readable by all members of the Commission.

Proprietary comments initially redacted from the Professional Team report shall be made available by the modeling organization to the Commission.

Items that the modeling organization is precluded from releasing due to third party contracts may be excluded.

In order to meet the public meeting notice requirements for the public meeting portion, one and a half hours shall be scheduled for the closed meeting.

A hard copy of the modeling organization's prepared presentation, Form V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item), and Form A-6 (Logical Relationship to Risk, Trade Secret item) shall be provided to the Commission and the Professional Team members (17 copies) at the start of the closed meeting. The hard copies will be returned to the modeling organization at the conclusion of the closed meeting and prior to anyone leaving the meeting room.

Public Meeting Portion

The modeling organization presentation shall include an explanation of corrections made for deficiencies noted by the Commission. The presentation shall be made using a medium that is readable by all members of the Commission and shall include the following:

1. Each standard number and title shall be stated;
2. An explanation of how each standard was met, with reference to any appropriate disclosures or forms that support compliance;
3. If relevant, a description of the material presented to the Professional Team for verification;
4. Any non-trade secret information that can be provided in order to facilitate a general understanding of the trade secret information presented to the Commission during the closed meeting.

Three to five hours shall be scheduled for review of a model not previously submitted and two and a half hours shall be scheduled for review of an existing model during a public meeting.

A hard copy of the modeling organization’s prepared presentation shall be provided to the Commission and the Professional Team members (17 copies) at the start of the public meeting.

All materials presented to the Commission during the public portion of the meeting to determine acceptability shall be provided to SBA staff in electronic format.

D. Acceptability and Notification. To be determined acceptable, the model shall have been found acceptable for all standards. If the model fails to be found acceptable by a majority vote for any one standard, the model will not be found to be acceptable. The modeling organization shall have an opportunity to appeal the Commission’s decision as specified under **VI. Review by the Commission, E. Appeal Process to be Used by a Modeling Organization if a Model is Not Found to be Acceptable by the Commission.**

Once the Commission has determined that a model is acceptable in accordance with the procedures in this process and that all required documentation as specified in the acceptability process has been provided to the Commission, the Chair of the Commission will provide the modeling organization with a letter confirming the Commission’s action. The letter shall be in the following format.

Date

(Name and Address of Modeling Organization)

Dear _____:

This will confirm the finding of the Florida Commission on Hurricane Loss Projection Methodology on (date), that the (name of modeling organization) computer model has been determined acceptable for projecting hurricane loss costs

and probable maximum loss levels for residential rate filings. The determination of acceptability expires on November 1, 2017.

The Commission has determined that the (name and version identification of the model) limited to the options selected in the input form provided in Standard A-1 (Modeling Input Data) Disclosure 5 complies with the standards adopted by the Commission on (date of adoption), and concludes that the (name and version identification of the model) limited to the Florida hurricane model options selected (Standard A-1 (Modeling Input Data) Disclosure 5) is sufficiently accurate and reliable for projecting hurricane loss costs and probable maximum loss levels for residential property in Florida.

On behalf of the Commission, I congratulate you and your colleagues. We appreciate your participation and input in this process.

Sincerely,
(Name), Chair

A copy of the letter will be provided to the Commissioner of the Office of Insurance Regulation.

E. Appeal Process to be Used by a Modeling Organization if a Model is Not Found to be Acceptable by the Commission. If a model is not found to be acceptable by the Commission, the modeling organization shall have up to thirty days to file a written appeal of the Commission's finding. The appeal shall specify the reasons for the appeal, identify the specific standard or standards in question, provide appropriate data and information to justify its position, and may request a follow up reconsideration meeting with the Commission to present any relevant or new information and data to the Commission in either a public or closed meeting format.

Within sixty days of receiving the appeal, the Commission shall hold a public meeting for the purpose of reviewing the appeal documentation and formulate additional questions to be responded to by the modeling organization and potentially request additional data and information. If the Commission determines additional data and information is necessary for reconsideration of the model, the Commission's questions, data, and information request shall be provided to the modeling organization in a letter from the Chair no later than ten days after the meeting to consider the appeal request. The modeling organization shall respond to the Commission within ten days of receiving the Commission Chair's letter. Any proprietary responses, data, or information shall be noted by the modeling organization indicating the response will be discussed in a closed session with the Commission.

The Commission will meet at a properly noticed public meeting to determine the acceptability of the model under the standards established by the Commission for reconsideration. If the Commission Chair determines that more preparation time is needed by Commission members, he/she may reschedule the meeting date to reconsider the model for acceptability, taking into consideration public notice requirements, the availability of a quorum of Commission members, the availability of a meeting room, and

the availability of the particular modeling organization.

Once the Commission has completed its reconsideration of acceptability and determined that a model has met all the standards being reconsidered and that all required documentation as specified in the acceptability process has been provided to the Commission, the Chair of the Commission will provide the modeling organization with a letter confirming the Commission's action as specified under **VI. Review by the Commission, D. Acceptability and Notification.**

If the model fails to be found acceptable by a majority vote for any one standard, the model will not be found to be acceptable and the appeal of the modeling organization shall have failed. In this regard, the findings of the Commission shall be final. The modeling organization will be required to wait until after the next revision or review of the standards before requesting the Commission to review its model.

- F. Discovery of Differences in a Model after a Model has been Determined to be Acceptable by the Commission.** If the modeling organization becomes aware of any differences between the model as found acceptable by the Commission and the model as provided to and used by its clients, the modeling organization shall without delay notify the Commission in writing describing the differences and the potential impact on loss costs and probable maximum loss levels. The notification shall be accompanied by Forms A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), A-4B (Output Ranges, 2012 FHCF Exposure Data), A-8 (Probable Maximum Loss for Florida), and S-5 (Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled). Additionally, the modeling organization shall state the level of the differences based on the classification scheme below (Type I, Type II, or Type III differences).

For purposes of complying with this requirement, a “difference” is anything that results in a model not being exactly the same as the model found acceptable by the Commission under the standards as adopted in this *Report of Activities*, but does not include interim software updates as addressed in **VI. Review by the Commission, G. Interim Software Updates after a Model has been Determined to be Acceptable by the Commission**, updates to geographical data or other interim data updates as addressed in **VI. Review by the Commission, H. Interim Updates to Geographical or Other Data after a Model has been Determined to be Acceptable by the Commission**, or other developmental changes to the model that are of the nature that would be appropriately reviewed according to the standards and procedures in the next *Report of Activities* scheduled for publication in 2015.

Upon receipt of the modeling organization's notification and documentation as specified above, the Chair shall consult with at least three members of the Professional Team in order to investigate, determine, and verify the impact of the differences as reported by the modeling organization.

The type of differences noted will be classified as falling into one of three of the following categories:

Type I: The model is not the exact same model as found acceptable or the submission needs to be revised due to the discovery of inaccuracies, but there are no differences in loss costs for any five digit ZIP Code area and there are no differences in probable maximum loss levels for any return period.

Type II: There are differences in one or more loss costs for a five digit ZIP Code area, but such differences do not exceed $\pm 1\%$ and there are changes in probable maximum loss levels for one or more return periods, but such differences do not occur at the rounded third significant digit of the probable maximum loss number.

Type III: There are differences in one or more loss costs for a five digit ZIP Code area that exceed $\pm 1\%$ or there are changes in probable maximum loss levels for one or more return periods that result in changes at the rounded third significant digit of the probable maximum loss number.

In the case of Type I differences:

1. The Chair, in consultation with at least three members of the Professional Team, shall verify the impact of the differences as reported by the modeling organization, and identify any additional documentation needed by the Commission. In its investigation and review of the issue, the Commission shall focus solely on the need for documentation explaining and describing the differences and ensuring that there is no impact on loss costs and probable maximum loss levels. The modeling organization's response related to differences noted at the Type I level shall only involve providing adequate documentation and shall not involve any further changes to the model. The modeling organization shall submit an addendum to the submission for the model previously found acceptable by the Commission thereby documenting the reasons, causes, and explanations for the differences. The addendum shall also encompass a discussion of why loss costs and probable maximum loss levels remain valid and have not changed from the previous model which the Commission found acceptable.
2. If the Chair determines that the documentation and explanations provided by the modeling organization are sufficient, no further action will be necessary by the Commission. The Chair shall provide a letter to the modeling organization acknowledging the notification of differences and noting that the Commission accepts the modeling organization's addendum to its previous submission. The letter shall note that a change in the model version identification is not required and that the model's acceptability shall expire as originally provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable** unless additional differences are discovered prior to expiration.
3. If the Chair determines that a new model version identification may be needed or that complexity of the reported differences needs to be addressed by the Commission at a special or regularly scheduled meeting, the Chair shall provide the Commission with detailed recommendations, such as the need for additional documentation or the need for further investigations, the potential need for a revised model version identification, or other appropriate recommendations given the circumstances. Additionally, the Chair shall propose what would constitute adequate documentation

and when such documentation should be provided to the Commission.

At the Commission meeting, the Vice Chair or, if not available to chair the meeting, a Committee Chair appointed by the Chair, shall preside at the meeting. The Chair shall make a motion for approval of the recommendations which shall require a second. The Commission shall then vote on the recommendations of the Chair, and any other alternative recommendations or amendments that are raised in the form of a motion that has been duly made and seconded by any other Commission member.

If backup documentation required is of a proprietary nature involving trade secrets, the Commission shall discuss only such items in a closed session. All votes shall be taken in a public meeting.

4. The acceptability of the model shall not be suspended on the basis of Type I differences as long as appropriate documentation is provided to the Commission in a timely fashion. No additional actions or changes to the model shall be required by the modeling organization with respect to Type I differences.
5. If the modeling organization fails to provide documentation that the Commission deems satisfactory within a time frame specified by the Commission, the acceptability of the model shall be suspended pending submission of the necessary documentation. The Chair shall notify the modeling organization by letter of such suspension. Once the documentation is provided by the modeling organization, the Chair shall review the documentation with at least three members of the Professional Team, and if the Chair determines that the documentation is appropriate, shall send a letter to the modeling organization indicating that the documentation is acceptable and the suspension is lifted.

In the case of Type II differences:

1. The Chair, in consultation with at least three members of the Professional Team, shall determine whether the modeling organization has already revised the model to address the differences to conform to the Commission standards or is capable of addressing the differences within 14 days after notifying the Commission of the discovery of Type II differences. If the model has been revised or can be revised within the 14 day time frame, the modeling organization shall submit an addendum to the submission for the model previously found acceptable thereby documenting the revisions, explaining the reasons for the differences, and providing any necessary backup documentation. If trade secret information is involved, the modeling organization shall include this fact in its notification to the Commission.
2. The Chair shall place the modeling organization's notification on the agenda for a special or regularly scheduled meeting of the Commission. The scheduling of the Commission meeting shall depend on the nature of the differences and the time frame for appropriate revisions to be made. The Chair shall provide Commission members with a copy of the modeling organization's notification and report the status related to the modeling organization's revision plan if on-going actions are required.

3. If the modeling organization has not made the necessary revisions to the model to conform to the Commission standards, the Chair shall provide in advance of the meeting a proposed plan of action for the Commission's consideration. The Vice Chair or, if not available to chair the meeting, a Committee Chair appointed by the Chair, shall preside at the meeting. The Commission shall consider the Chair's proposal and, upon the proposal being moved and seconded, vote on the plan of action of the Chair, and any other alternative recommendations or amendments that are raised in the form of a motion that has been duly made and seconded by any other Commission member. All plans of action shall include specific time frames including deadlines and the required documentation regarding the necessary revisions to conform to the Commission standards.
4. Once the modeling organization has made the appropriate revisions within the Commission's specified time frames, as verified by the Chair in consultation with at least three members of the Professional Team, the Chair shall call a special meeting or include an agenda item on the Commission's next regularly scheduled meeting for the purpose of reviewing the revisions to the model needed in order for the model to comply with the Commission standards. The Commission shall review the model as it deems necessary and may go into a closed session for discussion of trade secrets. The Commission shall conduct a minimum of six votes (one for each grouping of standards) with the option of any member being allowed to request a carve out of a specific standard or standards (without the requirement for a second to such motion). The basic process adopted in this *Report of Activities* regarding the "Process for Determining the Acceptability of a Computer Simulation Model" in **VI. Review by the Commission, A. General Review of a Modeling Organization, B. Meeting to Determine Acceptability, C. Modeling Organization Presentation, and D. Acceptability and Notification** will be followed. The notification letter regarding the acceptability of the model will be revised to acknowledge the type of differences discovered and the revisions from the original submission related to the previously acceptable model version. The new model version identification as assigned by the modeling organization shall be noted, and the revised model shall supersede the previously acceptable model. The acceptability of the revised model shall expire at the end of the current cycle as provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable** unless additional differences are discovered prior to expiration.
5. If the modeling organization fails to make the appropriate changes within the Commission's specified time frame, the model shall be suspended until the appropriate revisions are made to conform the model such that it meets the Commission standards. The Chair shall send a letter to the modeling organization indicating that the acceptability of the model has been suspended until the Commission votes on the acceptability of the revised model and a new model version identification has been assigned by the modeling organization. Once the Commission has determined acceptability of the revised model, the revised model shall supersede the previously acceptable model. The acceptability of the revised model shall expire at the end of the current cycle as provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable** unless additional differences are discovered prior to expiration.

In the case of Type III differences:

1. The acceptability of the model is suspended upon receipt of the notification of Type III differences or at any time during a Commission review where the magnitude of such differences are discovered and can be documented. The Chair shall send the modeling organization a letter indicating that the acceptability of the model by the Commission has been suspended immediately upon such notification or discovery and will remain suspended until the Commission investigates and takes action regarding the modeling organization's steps necessary to address the differences in order to bring the model in compliance with the Commission standards as adopted in this *Report of Activities*.
2. The Chair, in consultation with at least three members of the Professional Team, shall determine whether the modeling organization has already revised the model to address the differences necessary to conform the model to the Commission standards or is capable of addressing the differences within 14 days of notifying the Commission or discovery of the Type III differences by the Professional Team or Commission. If the model has been revised or can be revised within the 14 day time frame, the modeling organization shall submit an addendum to the submission for the model previously found acceptable thereby documenting the revisions, explaining the reasons for the differences, and providing any necessary backup documentation. If trade secret information is involved, the modeling organization shall so indicate in its notification to the Commission.
3. The Chair shall place the modeling organization's notification or discovery by the Professional Team or Commission on the agenda for a special or regularly scheduled meeting of the Commission. The scheduling of the Commission meeting will depend on the nature of the differences and the time frame for appropriate revisions to be made. The Chair shall provide Commission members with a copy of the modeling organization's notification and report the status related to the modeling organization's revision plan if on-going actions are required.
4. If the modeling organization has not made any revisions to the model to conform to the Commission standards, the Chair shall provide in advance of the meeting a proposed plan of action for the Commission's consideration. The Vice Chair or, if not available to chair the meeting, a Committee Chair appointed by the Chair, shall preside at the meeting. The Commission shall consider the Chair's proposal and, upon the proposal being moved and seconded, vote on the Chair's proposed plan of action, and any other alternative recommendations or amendments that are raised in the form of a motion that has been duly made and seconded by any other Commission member. All plans of action shall include specific time frames including deadlines and documentation regarding the needed revisions for the modeling organization in order for the model to conform to the Commission standards.
5. If the modeling organization has already revised the model or once the modeling organization has made the appropriate revisions within the Commission's specified time frames, as verified by the Chair in consultation with at least three members of the Professional Team, the Chair shall call a special meeting or include an agenda

item on the Commission's next regularly scheduled meeting for the purpose of reviewing the revisions to the model needed in order for the model to comply with the Commission standards. The Commission shall review the model as it deems necessary and may go into a closed session for a discussion of trade secrets. The Commission shall conduct a minimum of six votes (one for each grouping of standards) with the option of any member being allowed to request a carve out of a specific standard or standards (without the requirement for a second to such motion). The basic process adopted in this *Report of Activities* regarding the "Process for Determining the Acceptability of a Computer Simulation Model" in **VI. Review by the Commission, A. General Review of a Modeling Organization, B. Meeting to Determine Acceptability, C. Modeling Organization Presentation, and D. Acceptability and Notification** will be followed. The notification letter regarding the acceptability of the model will be revised to acknowledge the type of differences discovered and the revisions from the original submission related to the previously acceptable model version. The new model version identification as assigned by the modeling organization shall be noted, and the revised model shall supersede the previously acceptable model. The acceptability of the revised model shall expire at the end of the current cycle as provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable** unless additional differences are discovered prior to expiration.

6. If the modeling organization fails to make the appropriate revisions within 60 days of the Commission being notified or the date where the Commission discovered the Type III differences, the acceptability of the model will be withdrawn subject to the appeal process as specified in **VI. Review by the Commission, E. Appeal Process to be Used by a Modeling Organization if a Model is Not Found to be Acceptable by the Commission**. If there is no appeal or the appeal is unsuccessful, this will require the modeling organization to wait until the next review cycle as determined by time frames established in the next *Report of Activities* scheduled for publication in 2015.

G. Interim Software Updates after a Model has been Determined to be Acceptable by the Commission. If a modeling organization makes updates/revisions to the model software where (1) the underlying model determined acceptable by the Commission has not been updated/revised, (2) the software update scope and utility is unrelated to Florida hurricane loss costs or probable maximum loss levels and does not include the Florida hurricane model, and (3) there are no changes to the loss costs or probable maximum loss levels, the modeling organization shall notify the Chair of the Commission in writing. The notification shall detail the nature of the software updates/revisions, the effect on the underlying acceptable model, and the effect on the model results.

The notification shall also include Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), Form A-4B (Output Ranges, 2012 FHCF Exposure Data), Form A-8 (Probable Maximum Loss for Florida), and Form S-5 (Average Annual Statewide Loss Costs – Historical versus Modeled) completed for the current accepted model and the proposed updated/revised version of the model software, and a percentage change comparison between the two versions to demonstrate no change. The proposed updated/revised model software shall be clearly identified with a new/unique software

version identification under the modeling organization's model revision policy. The underlying model version identification shall remain the same.

Depending on the nature of the interim software updates, the Chair in consultation with the Professional Team may recommend the Professional Team conduct a review which may involve a virtual review provided the modeling organization is in agreement and can provide access to full modeling material.

The Chair shall review the notification and inform the Commission members as soon as possible, and assess, with at least three members of the Professional Team, the regression test results. If there is no change in the underlying acceptable model and no change in the model results, the Chair shall send an updated acceptability notification letter to the modeling organization denoting that the interim software updates do not produce significant differences in loss costs and probable maximum loss levels from the currently accepted model and the same expiration date shall apply as for the currently accepted model. The same model version identification and the new software version identification as assigned by the modeling organization shall be noted.

If the Chair, in consultation with at least three members of the Professional Team, determines there is a change in the underlying acceptable model or a change in the model results, then the Chair shall send a letter to the modeling organization as soon as practical notifying the organization of a pending review by the Commission. The Chair will determine the need for a special meeting or whether the issue can be addressed at the next regularly scheduled meeting of the Commission. The purpose of the Commission meeting will be to review the interim software updates and any other aspect of the model which might have changed in order to ensure that the model continues to comply with the Commission standards. The Commission shall conduct a minimum of six votes (one for each grouping of standards) with the option of any member being allowed to request a carve out of a specific standard or standards (without the requirement for a second to such motion). The basic process adopted in this *Report of Activities* regarding the "Process for Determining the Acceptability of a Computer Simulation Model" in **VI. Review by the Commission, A. General Review of a Modeling Organization, B. Meeting to Determine Acceptability, C. Modeling Organization Presentation, and D. Acceptability and Notification** will be followed. The notification letter regarding the acceptability of the model will be revised to acknowledge the interim software updates to the previously acceptable model and software version. The new model and software version identifications as assigned by the modeling organization shall be noted. Once the Commission has determined acceptability of the revised model, the revised model shall supersede the previously acceptable model. The acceptability of the revised model shall expire at the end of the current cycle as provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable**.

If the revised model's proposed interim software changes are not found to be acceptable by the Commission, the Chair shall send a letter to the modeling organization noting such and that the model previously found to be acceptable by the Commission shall continue to be acceptable and expires as originally provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable**.

The appeal process as specified in **VI. Review by the Commission, E. Appeal Process to be Used by a Modeling Organization if a Model is Not Found to be Acceptable by the Commission** shall not be applicable. This will require the modeling organization to make any contemplated software update changes for the Commission's consideration in the next review cycle as determined by time frames established in the next *Report of Activities* scheduled for publication in 2015.

H. Interim Updates to Geographical or Other Data after a Model has been Determined to be Acceptable by the Commission. If a modeling organization updates geographic location data within the model software or makes other updates to data where the underlying model determined acceptable by the Commission has not been updated or revised, the modeling organization shall notify the Chair of the Commission in writing. The notification shall detail the nature of the updates and the effect on the model results.

The notification shall include Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), Form A-4B (Output Ranges, 2012 FHCF Exposure Data), Form A-8 (Probable Maximum Loss for Florida), and Form S-5 (Average Annual Statewide Loss Costs – Historical versus Modeled) completed for the current accepted model and the proposed updated/revised version of the model, and a percentage change comparison between the two versions. The proposed interim data update designation as assigned by the modeling organization shall be clearly identified.

If a modeling organization updates geographic location data within the model software, the modeling organization shall also provide maps showing ZIP Code centroids (previous and updated) for the entire state of Florida. The modeling organization shall provide a sorted list of all ZIP Code centroid movements of one mile or more, the top ten movements (if fewer than ten move at least one mile), and a list of new and retired ZIP Codes. The corresponding primary county for each ZIP Code listed shall be provided. The modeling organization shall provide a list of all ZIP Code related databases used by the model and describe the impact to these databases due to the updated ZIP Codes (including roughness factors, building construction, and ZIP Code specific vulnerability functions).

If backup documentation required is of a proprietary nature involving trade secrets, the Commission shall discuss only such items in a closed session. If trade secret information is involved, the modeling organization shall include this fact in its notification to the Commission.

In situations involving other data updates as indicated in the modeling organization submission in response to Standard G-1 (Scope of the Computer Model and Its Implementation) Disclosure 6, the modeling organization shall describe the impact of the data updates on loss costs and probable maximum loss levels and indicate why such interim data updates are considered necessary. The modeling organization shall provide a list of all databases used by the model related to the data updates and describe the impact to these databases due to the updates. The Commission will not consider other interim data updates unless such possible updates have been disclosed by the modeling organization in the submission response to Standard G-1 (Scope of the Computer Model and Its Implementation) Disclosure 6.

The Chair shall review the notification and inform the Commission members as soon as possible, and assess, with at least three members of the Professional Team, the regression test results. If the regression test results confirm that the model has not changed with regard to loss costs and probable maximum loss levels, the Chair shall send an updated acceptability notification letter to the modeling organization denoting that the interim data updates do not produce significant differences in loss costs and probable maximum loss levels from the currently accepted model. The same model version identification and a distinction made for the interim data update(s) as assigned by the modeling organization shall be noted. The acceptability of the model with the interim data update(s) shall expire at the end of the current cycle as provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable.**

If the Chair, in consultation with at least three members of the Professional Team, determines that there are changes due to the geographical data updates reported or other interim data updates as provided for in Standard G-1 (Scope of the Computer Model and Its Implementation) Disclosure 6, then the Chair shall send a letter to the modeling organization as soon as practical notifying the modeling organization of a pending review by the Commission. The Chair will determine the need for a special meeting or whether the issue can be addressed at the next regularly scheduled meeting of the Commission. The purpose of the Commission meeting will be to review the data updates and any other aspect of the model which might have changed in order to ensure that the model continues to comply with the Commission standards. The Commission shall conduct a minimum of six votes (one for each grouping of standards) with the option of any member being allowed to request a carve out of a specific standard or standards (without the requirement for a second to such motion). The basic process adopted in this *Report of Activities* regarding the “Process for Determining the Acceptability of a Computer Simulation Model” in **VI. Review by the Commission A. General Review of a Modeling Organization, B. Meeting to Determine Acceptability, C. Modeling Organization Presentation, and D. Acceptability and Notification** will be followed. The notification letter regarding the acceptability of the model will be revised to acknowledge the nature of the data updates to the previously acceptable model version. The new model version identification and a distinction made for the interim data updates as assigned by the modeling organization shall be noted. Once the Commission has determined acceptability of the revised model, the revised model shall supersede the previously acceptable model. The acceptability of the revised model shall expire at the end of the current cycle as provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable.**

If the revised model’s proposed data updates are not found to be acceptable by the Commission, the Chair shall send a letter to the modeling organization noting such and that the model previously found to be acceptable by the Commission shall continue to be acceptable and will expire as originally provided for in **VI. Review by the Commission, J. Expiration of a Model Found Acceptable.**

The appeal process as specified in **VI. Review by the Commission, E. Appeal Process to be Used by a Modeling Organization if a Model is Not Found to be Acceptable by the Commission** shall not be applicable. This will require the modeling organization to make the contemplated data updates for consideration by the Commission in the next

review cycle as determined by time frames established in the next *Report of Activities* scheduled for publication in 2015.

I. Review and Acceptance Criteria for Functionally Equivalent Model Software Platforms. If a modeling organization has designed its model to operate on two or more software platforms, the Commission may find the model as run on the various software platforms acceptable under the following circumstances and procedures.

1. The various model platforms shall be submitted for review at one time by the designated submission deadline and shall be capable of being reviewed concurrently by the Commission, including the Professional Team's on-site review, such that all platforms can be reviewed as to their functional equivalence.
2. Functional equivalence will be recognized as long as no lost costs differ with regard to any platform at the rounded third decimal place (thus there should be no changes in the published Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code) and Form A-4B (Output Ranges, 2012 FHCF Exposure Data)), and probable maximum loss does not differ by more than $\pm 0.5\%$ for any probable maximum loss level (Form A-8, Probable Maximum Loss for Florida).
3. The model as implemented on the various platforms shall have the same model version identification with a notation to designate the specific model platform(s). The modeling organization shall specify which software platform is the primary software platform and which software platform(s) are the functionally equivalent software platform(s). This information shall be disclosed in the modeling organization submission in response to Standard G-1 (Scope of the Computer Model and Its Implementation) Disclosure 1.
4. The modeling organization will not be allowed to make separate submissions during a review cycle and any difference between model platforms will be required to be fully described in the modeling organization's original submission.
5. The only differences in model results shall be demonstrated to be solely due to the nature of the model platform(s) or any other technological constraint that would account for no more than the designated variations noted above.

Once the Commission has determined functional equivalence of the model software platform(s), the Chair shall send an acceptability notification letter to the modeling organization designating specifically which model software platform(s) were found to be functionally equivalent and acceptable by the Commission.

J. Expiration of a Model Found Acceptable. The determination of acceptability of a model found acceptable under the standards contained in the *Report of Activities as of November 1, 2013*, expires on November 1, 2017.

Model Submission Checklist

1. Please indicate by checking below that the following has been included in your submission documentation to the Florida Commission on Hurricane Loss Projection Methodology.

Yes	No	Item
		1. Letter to the Commission
		a. Refers to the certification forms and states that professionals having credentials and/or experience in the areas of meteorology, statistics, engineering, actuarial science, and computer science have reviewed the model for compliance with the standards
		b. States model is ready to be reviewed by the Professional Team
		c. Any caveats to the above statements noted with a complete explanation
		2. Summary statement of compliance with each individual standard and the data and analyses required in the disclosures and forms
		3. General description of any trade secret information the modeling organization intends to present to the Professional Team
		4. Model Identification
		5. Seven (7) Bound Copies (duplexed)
		6. Link containing:
		a. Submission text in PDF format
		b. PDF file supports highlighting and hyperlinking, and is bookmarked by standard, form, and section
		c. Data file names include abbreviated name of modeling organization, standards year, and form name (when applicable)
		d. Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis), if required, in ASCII and PDF format
		e. Forms M-1 (Annual Occurrence Rates), M-3 (Radius of Maximum Winds and Radii Of Standard Wind Thresholds), V-2 (Mitigation Measures – Range of Changes in Damage), A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), A-2 (Base Hurricane Storm Set Statewide Losses), A-3A (2004 Hurricane Season Losses, 2007 FHCF Exposure Data), A-3B (2004 Hurricane Season Losses, 2012 FHCF Exposure Data), A-4A (Output Ranges, 2007 FHCF Exposure Data), A-4B (Output Ranges, 2012 FHCF Exposure Data), A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data), A-7 (Percentage Change in Logical Relationship to Risk), and A-8 (Probable Maximum Loss for Florida) in Excel format
		7. All hyperlinks to the locations of forms are functional
		8. Table of Contents
		9. Materials consecutively numbered from beginning to end starting with the first page (including cover) using a single numbering system, including date and time
		10. All tables, graphs, and other non-text items consecutively numbered using whole numbers
		11. All tables, graphs, and other non-text items specifically listed in Table of Contents
		12. All tables, graphs, and other non-text items clearly labeled with abbreviations defined
		13. All column headings shown and repeated at the top of every subsequent page for forms and tables
		14. Standards, disclosures, and forms in <i>italics</i> , modeling organization responses in non- <i>italics</i>
		15. All graphs and maps conform to guidelines in II. Notification Requirements A.5.e.

Yes	No	Item
		16. All units of measurement clearly identified with appropriate units used
		17. All forms included in submission document as Appendices except Forms V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item), A-6 (Logical Relationship to Risk, Trade Secret item), and S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)
		18. Hard copy documentation identical to electronic version
		19. Signed Expert Certification Forms G-1 to G-7

2. Explanation of “No” responses indicated above. (Attach additional pages if needed.)

Model Name and Identification

Modeler Signature

Date

VI. ON-SITE REVIEW

ON-SITE REVIEW BY PROFESSIONAL TEAM

General Purpose

The purpose of the on-site review is to evaluate the compliance of the model with the standards, disclosures, forms, and trade secret items. The on-site review is conducted in conjunction with the **Process for Determining the Acceptability of a Computer Simulation Model**. It is not intended to provide a preliminary peer review of the model. The goal of the Professional Team's efforts is to provide the Commission with a clear and thorough report of the model as required in the acceptability process, subject to non-disclosure conditions. All modifications, adjustments, assumptions, or other criteria that were included in producing the information required by the Commission in the submission shall be disclosed and will be reviewed.

The Professional Team will begin the review with a briefing to modeling organization personnel to discuss the review schedule and to describe the subsequent review process.

The on-site review by the Professional Team will involve the following:

1. Due diligence review of information submitted by the modeling organization. For existing modeling organizations, the due diligence review will concentrate on any changes in the disclosures and forms as noted in the Notification of Readiness letter.
2. On-site tests of the model under the control and supervision of the Professional Team. The object is to observe the model in operation and the results it produces during a "real time" run. This is necessary in order to avoid the possibility that the modeling organization could recalibrate the model solely for producing desirable results.
3. Verification that information provided by the modeling organization in the disclosures and forms is valid and is an accurate and fairly complete description of the model.
4. Review for compliance with the standards. The Professional Team will attempt to consider each grouping of standards as a unit.
5. Review of trade secret items.

Feedback regarding compliance of the model with the standards, disclosures, forms, and trade secret items will be provided to the modeling organization throughout the review process.

Preparation for On-Site Review

The Professional Team will assist the Commission and the SBA staff in determining if a modeling organization is ready for an on-site review.

The Professional Team will assist the modeling organization in preparing for the on-site review, by providing to SBA staff a detailed pre-visit letter (to be sent to the modeling organization) outlining specific issues to be addressed by each modeling organization unique to their model

submission. The Professional Team makes every effort to identify substantial issues with the model or submission to allow the modeling organization adequate time to prepare for the on-site review. As the Professional Team continues to prepare for the review, it may discover issues not originally covered in the pre-visit letter prior to the on-site review. Such issues will be introduced at the opening briefing of the on-site review. The discovery of errors in the model by the Professional Team is a possible outcome of the review. It is the responsibility of the modeling organization to assure the validity and correctness of its model.

Telephone Conference Call: After the Commission has determined the modeling organization is ready to continue in the review process and prior to the on-site review, at the request of the Commission or the modeling organization, the SBA staff will arrange a telephone conference call between the modeling organization and the Professional Team or a subset of the Professional Team. The purpose of the call is to review the pre-visit letter, material, data files, and personnel that will need to be on-site during the review. This does not preclude the Professional Team from asking for additional information during the on-site review that was not discussed during the conference call or included in the pre-visit letter. The call will allow the modeling organization and the Professional Team the opportunity to clarify any concerns or ask any questions regarding the upcoming on-site review. This call will be the only scheduled opportunity for the modeling organization to clarify any questions directly with the Professional Team prior to their on-site review.

Scheduling: The SBA staff is responsible for scheduling on-site review dates. Each modeling organization will be notified at least two weeks prior to the scheduled review. The actual length of the review may vary depending on the preparedness of the modeling organization and the depth of the inquiry needed for the Professional Team to obtain an understanding of the model. The Commission expects new models under consideration to be well-prepared for a review by the Professional Team. In particular, it is suggested that a modeling organization conduct a detailed self-audit to assure that it is ready for the Professional Team review.

Presentation of Materials: The modeling organization shall have all necessary materials and data on-site for review. All material referenced in the 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.

All materials, charts, graphs, and maps used in support of the model and the computer code shall be presented in a manner that is readable by all members of the Professional Team simultaneously.

Professional Team Report

After completing its review of the standards, disclosures, forms, and trade secret items, the Professional Team will conduct an exit briefing with the modeling organization. During this briefing, the Professional Team will provide a preliminary draft of the Professional Team report. This offers the modeling organization an opportunity to check for any factual errors and to expunge any trade secret information. The Professional Team will accede to modeling organization suggestions for changes in its draft only to correct factual errors and to remove any

trade secret information. If the modeling organization and the Professional Team dispute a particular item as a factual error, then the report will adopt the phrasing, “In the opinion of the Professional Team, ...”

The pre-edited, preliminary draft of the Professional Team report shall be made available to the Commission at the closed meeting where trade secrets used in the design and construction of the hurricane loss model are discussed. Any material deemed proprietary will be designated as trade secret. The pre-edited, preliminary draft will be placed in a sealed envelope marked “Confidential” with the date, time, and Professional Team leader’s signature across the seal. The draft will be kept by the modeling organization and returned to the Professional Team leader during the closed meeting to discuss trade secrets. At the conclusion of the closed meeting, the draft will be returned to the modeling organization.

The report will include:

- A list of participants;
- A summary of significant changes to the model from the previous year;
- Any corrections made to the submission that were reviewed by the Professional Team and will be provided to the Commission in the revised submission at least ten days prior to the Commission meeting to review the model for acceptability;
- A verification that any deficiencies noted by the Commission have been resolved;
- A copy of the pre-visit letter;
- A verification of compliance with the standards, disclosures, and forms;
- A description of material reviewed in support of compliance with the standards, disclosures, and forms;
- A list of materials needed in preparation for an additional verification review, if applicable;
- A list of trade secret items the modeling organization shall present to the Commission during the closed meeting portion of the Commission meeting to review models for acceptability; and
- A statement indicating where proprietary information has been removed.

After leaving the modeling organization’s premises, the Professional Team, in coordination with SBA staff, will finalize its report and provide it to Commission members in advance of the meeting to review the model for acceptability. Any disparate opinions among Professional Team members concerning compliance with the standards, disclosures, forms, and trade secret items will be noted and explained.

Additional Verification Review

It is possible that a subset of the standards or changes made to the disclosures, forms, and trade secret items may require further review by the Professional Team or a subset of the Professional Team. In such cases, the SBA staff will arrange an additional verification review, in accordance with the acceptability process, to verify those standards, disclosures, forms, and trade secret items.

In preparation for an additional verification review, the Professional Team will list in their report an initial set of materials needed for preparation prior to the re-visit. Non-trade secret materials are to be received by SBA staff no later than seven days prior to the additional verification review. Trade secret materials requested are to be provided at the onset of the additional verification review. Additional materials may be requested on-site by the Professional Team in order to verify the standards.

Trade Secret Information

While on-site, the Professional Team members are expected to have access to trade secret data and information. It is the responsibility of the modeling organization to identify to all Professional Team members what is a trade secret and is not to be made public.

All written documentation provided by the modeling organization to the Commission will be considered a public document with the exception of documents provided during the closed meeting where trade secrets used in the design and construction of the hurricane loss model are discussed.

The modeling organization shall provide any additional information directly to the Commission rather than give it to Professional Team members to be brought back with them. Documents that the modeling organization indicates are trade secret that are viewed by Professional Team members will not be considered public documents and are to be left on-site.

Any notes made by Professional Team members containing trade secrets will be expunged by the modeling organization and placed in a sealed envelope marked "Confidential" with the date, time, and Professional Team member's signature across the seal. The notes will be kept by the modeling organization and returned to the Professional Team member during the closed meeting to discuss trade secrets. At the conclusion of the closed meeting, all notes will be returned to the modeling organization.

Trade secrets of the modeling organization learned by a Professional Team member will not be discussed with Commission members.

Professional Team members will agree to respect the trade secret nature of the model and not use trade secret information in any way detrimental to the interest of the modeling organization.

Care will be taken by the Professional Team members not to discuss other models being evaluated while they are on-site reviewing a particular model.

On-Site Review Results

The Professional Team will present the results of the on-site review to the Commission and answer questions related to their review.

The job of the Professional Team is to verify information and make observations. It is not part of the Professional Team's responsibilities to opine or draw conclusions about the appropriateness of a particular model or a component part of a model.

Refer to the **Process for Determining the Acceptability of a Computer Simulation Model** for additional information regarding the on-site review.

PROFESSIONAL TEAM

Composition and Selection of the Professional Team

A team of professional individuals, known as the Professional Team, will conduct on-site reviews of modeling organizations seeking a determination of acceptability by the Commission. The Professional Team will consist of individuals having professional credentials in the following disciplines (each area will be represented by one or more individuals): Actuarial Science, Statistics, Meteorology, Computer Science, and Engineering.

The SBA staff will select the Professional Team members, and the SBA will enter into contracts with each individual selected.

Selection of the Professional Team members will be an aggressive recruiting process to seek out qualified individuals who are capable of working closely with the Commission and who are available during specified time frames in order that the Commission can meet its deadline(s). Consideration will be given to the following factors:

- Professional credentials and experience
- Reasonableness of fees
- Availability
- References
- Lack of conflicts of interest

Responsibilities of the Professional Team

Team Leader: The SBA staff will designate one member of the Professional Team as the team leader. The team leader will be responsible for coordinating the activities of the Professional Team and overseeing the development of reports to the Commission.

Team Members:

1. Participate in preparations and discussions with the Commission and SBA staff prior to the on-site review.
2. Study, review, and develop an understanding of responses and materials provided to the Commission by the modeling organizations.
3. Participate with the Commission and SBA staff in developing, reviewing, and revising model tests and evaluations.
4. While on-site, verify, evaluate, and observe the techniques and assumptions used in the model for each member's area of expertise.
5. Identify and observe how various assumptions affect the model so as to identify to the Commission various sensitive components/aspects of the model.

6. Discuss the model with the modeling organization's professional staff to gain a clear understanding and confidence in the operation of the model and its description as provided to the Commission.
7. Participate in the administration of on-site tests.
8. Participate in the preparation of written reports and presentations to the Commission.

Responsibilities of SBA Staff

The Professional Team will report to designated SBA staff. SBA staff will supervise the Professional Team and coordinate their pre-on-site planning activities, on-site reviews and activities, and post-on-site activities.

These responsibilities include:

1. Setting up meetings with Professional Team members individually and as a group. These meetings will include conference calls and other meetings depending on circumstances and needs of the Commission.
2. Coordinating and scheduling on-site reviews.
3. Working with the Commission and Professional Team members in developing, reviewing, and revising model tests and evaluations.
4. Overseeing the supervision and administration of specified on-site tests and evaluations.
5. Working with the modeling organization to determine which professionals at the modeling organization will work with corresponding Professional Team members while on-site.
6. Briefing and de-briefing the Professional Team members prior to, during, and after the on-site review.
7. Coordinating the preparation of written reports and presentations to the Commission.
8. Coordinating the reimbursement of expenses per s. 112.061, F.S., for Professional Team members, Commission members, and SBA staff.

VII. 2013 STANDARDS, DISCLOSURES, AND FORMS

Florida Commission on Hurricane Loss Projection Methodology

Model Identification

Name of Model: _____

Model Version Identification: _____

Software Program Version Identification: _____

Interim Software Program Version Update Identification: _____

Software Platform Name and Identifications: _____

Interim Data Update Designation: _____

Name of Modeling Organization: _____

Street Address: _____

City, State, ZIP Code: _____

Mailing Address, if different from above: _____

Contact Person: _____

Phone Number: _____ Fax Number: _____

E-mail Address: _____

Date: _____

Submission Data

The following input data have been provided to the modeling organization on the enclosed CD.

Input Data

Name	Description
2013FormM1.xlsx	Hurricanes used for historical frequencies in Form M-1 (Annual Occurrence Rates)
2013FormM3.xlsx	Rmax and Radii format for Form M-3 (Radius of Maximum Winds and Radii of Standard Wind Thresholds)
FormS6Input13.xlsx	Input variables for Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)
FormS6Input13Quantiles.xlsx	Corresponding quantiles for input variables for Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)
hlpm2007c.exe	2007 FHCF aggregate personal and commercial residential exposure data for Form S-2A (Examples of Loss Exceedance Estimates, 2007 FHCF Exposure Data), Form S-5 (Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled), Form A-2 (Base Hurricane Storm Set Statewide Losses), Form A-3A (2004 Hurricane Season Losses, 2007 FHCF Exposure Data), Form A-4A (Output Ranges, 2007 FHCF Exposure Data), and Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data)
hlpm2012c.exe	2012 FHCF aggregate personal and commercial residential exposure data for Form S-2B (Examples of Loss Exceedance Estimates, 2012 FHCF Exposure Data), Form S-5 (Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled), Form A-2 (Base Hurricane Storm Set Statewide Losses), Form A-3B (2004 Hurricane Season Losses, 2012 FHCF Exposure Data), Form A-4B (Output Ranges, 2012 FHCF Exposure Data), and Form A-8 (Probable Maximum Loss for Florida)
NotionalInput13.xlsx	Notional structures and location grids for Form S-2A (Examples of Loss Exceedance Estimates, 2007 FHCF Exposure Data), Form S-2B (Examples of Loss Exceedance Estimates, 2012 FHCF Exposure Data), Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), Form A-6 (Logical Relationship to Risk, Trade Secret item), and Form A-7 (Percentage Change in Logical Relationship to Risk)
FormV1Input13.xlsx	Windspeeds for 96 ZIP Codes and personal and commercial residential exposure data (construction type and ZIP Codes) for Form V-1 (One Hypothetical Event)
2013FormA1.xlsx	Loss cost data format for Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code)
2013FormA4A.xlsx	Output ranges format for Form A-4A (Output Ranges, 2007 FHCF Exposure Data)

Name	Description
2013FormA5.xlsx	Percentage change in average loss cost output range data format for Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data)
2013FormA7.xlsx	Percentage change in logical relationship to risk exhibits format for Form A-7 (Percentage Change in Logical Relationship to Risk)

Output shall be provided in specified output files as listed below. XXX denotes the abbreviated name of the modeling organization.

Output Data

Name	Description
XXX13FormM1.xlsx	Output data from Form M-1 (Annual Occurrence Rates)
XXX13FormM3.xlsx	Output data from Form M-3 (Radius of Maximum Winds and Radii of Standard Wind Thresholds)
XXX13Expected Loss Cost.dat and XXX13Expected Loss Cost.pdf	Aggregated loss cost output data from Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)
XXX13Loss Cost Contour.dat and XXX13Loss Cost Contour.pdf	Mean loss cost output data from Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)
XXX13SenAnal.dat and XXX13SenAnal.pdf	Loss cost output data for the sensitivity analysis portion of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)
XXX13UncAnal.dat and XXX13UncAnal.pdf	Loss cost output data for the uncertainty analysis portion for CP, Rmax, VT, Shape Parameter, CF, FFP, Quantile of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis)
XXX13FormV2.xlsx	Output data from Form V-2 (Mitigation Measures – Range of Changes in Damage)
XXX13FormA1.xlsx and XXX13FormA1.pdf	Underlying loss cost data from Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code)
XXX13FormA2.xlsx	Output data from Form A-2 (Base Hurricane Storm Set Statewide Losses)
XXX13FormA3A.xlsx	Output data from Form A-3A (2004 Hurricane Season Losses, 2007 FHCF Exposure Data)
XXX13FormA3B.xlsx	Output data from Form A-3B (2004 Hurricane Season Losses, 2012 FHCF Exposure Data)
XXX13FormA4A.xlsx	Output range exhibits from Form A-4A (Output Ranges, 2007 FHCF Exposure Data)
XXX13FormA4B.xlsx	Output range exhibits from Form A-4B (Output Ranges, 2012 FHCF Exposure Data)
XXX13FormA5.xlsx	Output data from Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data)

Name	Description
XXX13FormA7.xlsx	Output data from Form A-7 (Percentage Change in Logical Relationship to Risk)
XXX13FormA8.xlsx	Output data from Form A-8 (Probable Maximum Loss for Florida)

The modeling organization shall run various scenario hurricane events through the model on the input exposure data. The referenced output forms shall be completed and loss files provided in ASCII, Excel, and PDF format as specified. The file names shall include the abbreviated name of the modeling organization, the standards year, and the form name. Revised files shall also include the revision date.

Figure 1

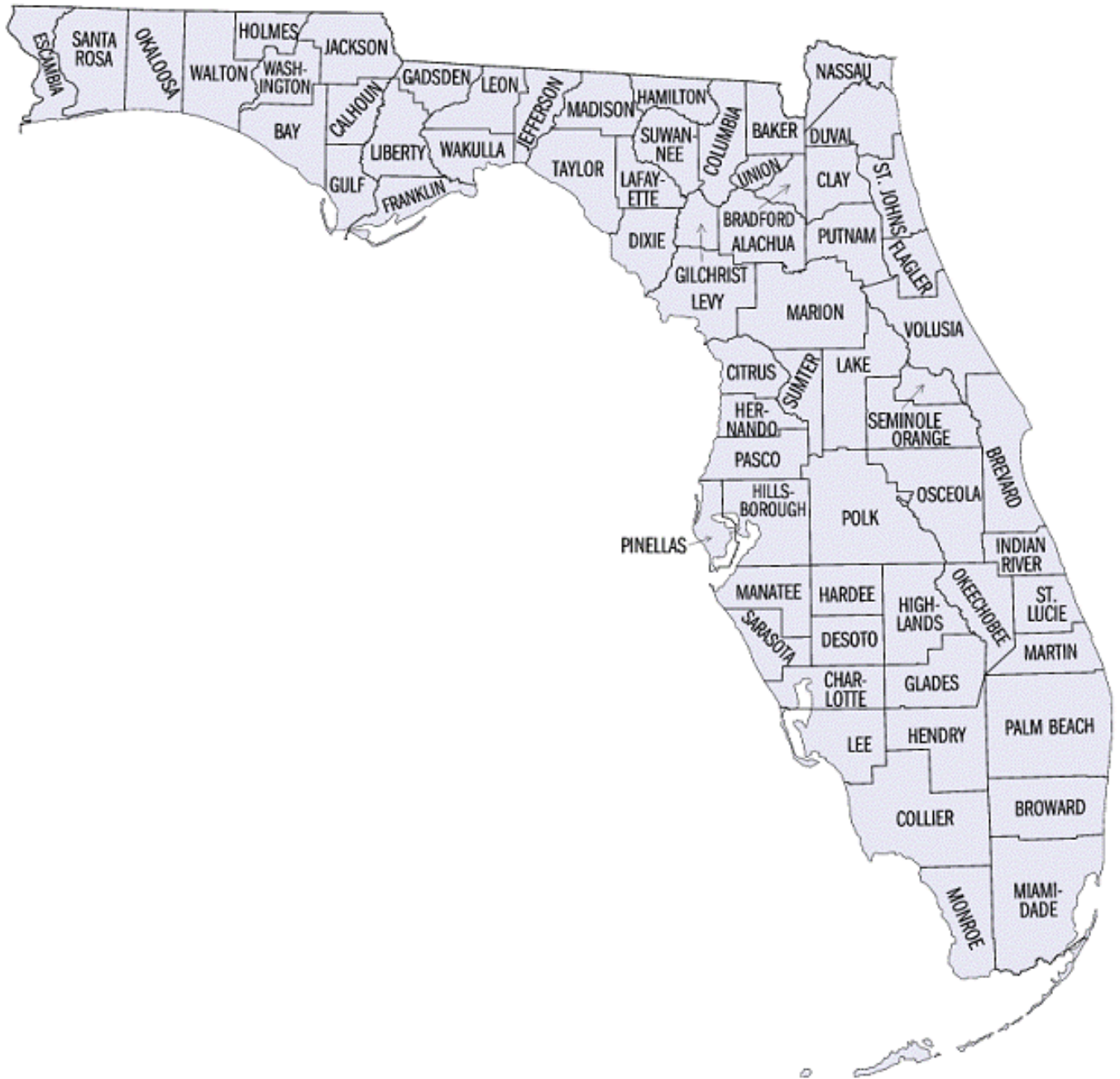
Florida County Codes

County Code	County Name	County Code	County Name	County Code	County Name
001	Alachua	049	Hardee	093	Okeechobee
003	Baker	051	Hendry	095	Orange
005	Bay	053	Hernando	097	Osceola
007	Bradford	055	Highlands	099	Palm Beach
009	Brevard	057	Hillsborough	101	Pasco
011	Broward	059	Holmes	103	Pinellas
013	Calhoun	061	Indian River	105	Polk
015	Charlotte	063	Jackson	107	Putnam
017	Citrus	065	Jefferson	109	St. Johns
019	Clay	067	Lafayette	111	St. Lucie
021	Collier	069	Lake	113	Santa Rosa
023	Columbia	071	Lee	115	Sarasota
027	De Soto	073	Leon	117	Seminole
029	Dixie	075	Levy	119	Sumter
031	Duval	077	Liberty	121	Suwannee
033	Escambia	079	Madison	123	Taylor
035	Flagler	081	Manatee	125	Union
037	Franklin	083	Marion	127	Volusia
039	Gadsden	085	Martin	129	Wakulla
041	Gilchrist	086	Miami-Dade	131	Walton
043	Glades	087	Monroe	133	Washington
045	Gulf	089	Nassau		
047	Hamilton	091	Okaloosa		

Note: These codes are derived from the Federal Information Processing Standards (FIPS) Codes.

Figure 2

State of Florida By County



Comparison of 2013 Standards to 2011 Standards

Standard	Title	Comments
General		
G-1	Scope of the Computer Model and Its Implementation	Significant Revision
G-2	Qualifications of Modeling Organization Personnel and Consultants	
G-3	Risk Location	Significant Revision
G-4	Independence of Model Components	
G-5	Editorial Compliance	
Meteorological		
M-1	Base Hurricane Storm Set	Significant Revision
M-2	Hurricane Parameters and Characteristics	
M-3	Hurricane Probabilities	Significant Revision
M-4	Hurricane Windfield Structure	Significant Revision
M-5	Landfall and Over-Land Weakening Methodologies	Significant Revision
M-6	Logical Relationships of Hurricane Characteristics	
Statistical		
S-1	Modeled Results and Goodness-of-Fit	
S-2	Sensitivity Analysis for Model Output	
S-3	Uncertainty Analysis for Model Output	
S-4	County Level Aggregation	
S-5	Replication of Known Hurricane Losses	
S-6	Comparison of Projected Hurricane Loss Costs	
Vulnerability		
V-1	Derivation of Vulnerability Functions	Significant Revision
V-2	Derivation of Contents and Time Element Vulnerability Functions	Significant Revision
V-3	Mitigation Measures	Significant Revision
Actuarial		
A-1	Modeling Input Data	
A-2	Event Definition	
A-3	Coverages	Significant Revision
A-4	Modeled Loss Cost and Probable Maximum Loss Considerations	
A-5	Policy Conditions	
A-6	Loss Output	Significant Revision
Computer		
C-1	Documentation	
C-2	Requirements	
C-3	Model Architecture and Component Design	Significant Revision
C-4	Implementation	
C-5	Verification	Significant Revision
C-6	Model Maintenance and Revision	Significant Revision
C-7	Security	

Note: *The Commission has determined that “significant changes” are those that result in or have potential for changes to loss costs or probable maximum loss levels. The Commission may determine, in its judgment, whether a change is significant.*

GENERAL STANDARDS

G-1 Scope of the Computer Model and Its Implementation*

*(*Significant Revision)*

- A. The computer model shall project loss costs and probable maximum loss levels for residential property insured damage from hurricane events.**
- B. The modeling organization shall maintain a documented process to assure continual agreement and correct correspondence of databases, data files, and computer source code to slides, technical papers, and modeling organization documents.**

Purpose: This standard gives a high level view of the scope of the model to be reviewed, namely projecting loss costs and probable maximum loss levels for residential property (personal and commercial) insured damage from hurricane events.

Relevant Form: G-1, General Standards Expert Certification

Disclosures

1. Specify the model version identification and software program version identification. If the model submitted for review is implemented on more than one software platform, specify each model software platform. Specify which software platform is the primary software platform and verify how any other software platforms produce the same model output results or are otherwise functionally equivalent as provided for in the “Process for Determining the Acceptability of a Computer Simulation Model” in VI. Review by the Commission, I. Review and Acceptance Criteria for Functionally Equivalent Model Software Platforms.
2. Provide a comprehensive summary of the model. This summary shall include a technical description of the model including each major component of the model used to produce residential loss costs and probable maximum loss levels in the State of Florida. Describe the theoretical basis of the model and include a description of the methodology, particularly the wind components, the vulnerability components, and the insured loss components used in the model. The description shall be complete and shall not reference unpublished work.
3. Provide a flow diagram that illustrates interactions among major model components.
4. Provide a comprehensive list of complete references pertinent to the submission by standard grouping, according to professional citation standards.

5. Provide the following information related to changes in the model from the previously accepted submission to the initial submission this year.
 - A. Model changes:
 1. A summary description of changes that affect the personal or commercial residential loss costs or probable maximum loss levels,
 2. A list of all other changes, and
 3. The rationale for each change.
 - B. Percentage difference in average annual zero deductible statewide loss costs based on the 2007 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "hlpm2007c.exe" for:
 1. All changes combined, and
 2. Each individual model component change.
 - C. Color-coded maps by county reflecting the percentage difference in average annual zero deductible statewide loss costs based on the 2007 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "hlpm2007c.exe" for each model component change.
 - D. Color-coded map by county reflecting the percentage difference in average annual zero deductible statewide loss costs based on the 2007 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "hlpm2007c.exe" for all model components changed.
6. Provide a list and description of any potential interim updates to underlying data relied upon by the model. State whether the time interval for the update has a possibility of occurring during the period of time the model could be found acceptable by the Commission under the review cycle in this *Report of Activities*.

Audit

1. The main intent of the audit is to determine the capabilities of the model and to assess its implementation for purposes of Florida projected insured loss costs and probable maximum loss levels. Copies of all representative or primary technical papers that describe the underlying model theory shall be made available.
2. The process defined in Standard G-1.B will be: (1) reviewed for its inclusion of all stages of the modeling process, and (2) traced using the Computer Standards for one or more items listed in the response to Disclosure 5.

3. All software and data (1) located within the model, (2) used to validate the model, (3) used to project model loss costs and probable maximum loss levels, and (4) used to create forms required by the *Report of Activities*:
 - a. Shall fall within the scope of the Computer Standards,
 - b. Shall be located in centralized, model-level file areas, and
 - c. Shall be reviewable interactively (viewed simultaneously by all Professional Team members in conjunction with the review of each standard).
4. Modeling organization specific publications cited must be available in hard or soft copy or via a web link.
5. Maps, databases, or data files relevant to the modeling organization's submission will be reviewed.
6. Provide the following information related to changes in the model from the initial submission this year to each subsequent revision.
 - A. Model changes:
 1. A summary description of changes that affect, or believe to affect, the personal or commercial residential loss costs or probable maximum loss levels,
 2. A list of all other changes, and
 3. The rationale for each change.
 - B. Percentage difference in average annual zero deductible statewide loss costs based on the 2007 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "*hlp2007c.exe*" for:
 1. All changes combined, and
 2. Each individual model component and subcomponent change.
 - C. For any modifications to Form A-4A (Output Ranges, 2007 FHCF Exposure Data) since the initial submission, additional versions of Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data):
 1. With the initial submission as the baseline for computing the percentage changes, and
 2. With any intermediate revisions as the baseline for computing the percentage changes.
 - D. Color-coded maps by county reflecting the percentage difference in average annual zero deductible statewide loss costs based on the 2007 Florida Hurricane

Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "*hlpm2007c.exe*" for each model component change:

1. Between the previously accepted submission and the revised submission,
2. Between the initial submission and the revised submission, and
3. Between any intermediate revisions and the revised submission.

G-2 Qualifications of Modeling Organization Personnel and Consultants

- A. Model construction, testing, and evaluation shall be performed by modeling organization personnel or consultants who possess the necessary skills, formal education, and experience to develop the relevant components for hurricane loss projection methodologies.**
- B. The model and model submission documentation shall be reviewed by either modeling organization personnel or consultants in the following professional disciplines: structural/wind engineering (licensed Professional Engineer), statistics (advanced degree), actuarial science (Associate or Fellow of Casualty Actuarial Society), meteorology (advanced degree), and computer/information science (advanced degree). These individuals shall certify Forms G-1 through G-6 as applicable.**

Purpose: Professional disciplines implicitly represented in Commission standards (structural/wind engineering, statistics, actuarial science, meteorology, computer/information science) shall be represented among modeling organization staff and consultants. Academic or professional designations are necessary, but not sufficient requirements of the personnel involved in model development, implementation, and preparation of material for review by the Commission.

Relevant Forms: G-1, General Standards Expert Certification
G-2, Meteorological Standards Expert Certification
G-3, Statistical Standards Expert Certification
G-4, Vulnerability Standards Expert Certification
G-5, Actuarial Standards Expert Certification
G-6, Computer Standards Expert Certification

Disclosures

1. Organization Background

- A. Describe the ownership structure of the modeling organization. Describe affiliations with other companies and the nature of the relationship, if any. Indicate if your organization has changed its name and explain the circumstances.
- B. If the model is developed by an entity other than a modeling company, describe its organizational structure and indicate how proprietary rights and control over the model and its critical components is exercised. If more than one entity is involved in the development of the model, describe all involved.

- C. If the model is developed by an entity other than a modeling company, describe the funding source for the model.
 - D. Describe the modeling organization's services.
 - E. Indicate if the modeling organization has ever been involved directly in litigation or challenged by a statutory authority where the credibility of one of its U.S. hurricane model versions for projection of loss costs or probable maximum loss levels was disputed. Describe the nature of each case and its conclusion.
2. Professional Credentials
- A. Provide in a chart format (a) the highest degree obtained (discipline and university), (b) employment or consultant status and tenure in years, and (c) relevant experience and responsibilities of individuals currently involved in the acceptability process or in any of the following aspects of the model:
 - 1. Meteorology
 - 2. Statistics
 - 3. Vulnerability
 - 4. Actuarial Science
 - 5. Computer Science
 - B. Identify any new employees or consultants (since the previous submission) working on the model or the acceptability process.
 - C. Provide visual business workflow documentation connecting all personnel related to model design, testing, execution, maintenance, and decision-making.
 - D. Indicate specifically whether individuals listed in A. and B. are associated with the insurance industry, a consumer advocacy group, or a government entity, as well as their involvement in consulting activities.
3. Independent Peer Review
- A. Provide reviewer names and dates of external independent peer reviews that have been performed on the following components as currently functioning in the model:
 - 1. Meteorology
 - 2. Statistics
 - 3. Vulnerability
 - 4. Actuarial Science
 - 5. Computer Science
 - B. Provide documentation of independent peer reviews directly relevant to the modeling organization's responses to the current standards, disclosures, or forms. Identify any unresolved or outstanding issues as a result of these reviews.

- C. Describe the nature of any on-going or functional relationship the organization has with any of the persons performing the independent peer reviews.
4. Provide a completed Form G-1, General Standards Expert Certification. Provide a link to the location of the form here.
 5. Provide a completed Form G-2, Meteorological Standards Expert Certification. Provide a link to the location of the form here.
 6. Provide a completed Form G-3, Statistical Standards Expert Certification. Provide a link to the location of the form here.
 7. Provide a completed Form G-4, Vulnerability Standards Expert Certification. Provide a link to the location of the form here.
 8. Provide a completed Form G-5, Actuarial Standards Expert Certification. Provide a link to the location of the form here.
 9. Provide a completed Form G-6, Computer Standards Expert Certification. Provide a link to the location of the form here.

Audit

1. The professional vitae of modeling organization personnel and consultants responsible for the current model and information on their predecessors if different than current personnel will be reviewed. Background information on individuals providing testimonial letters in the submission shall be provided.
2. Forms G-1 (General Standards Expert Certification), G-2 (Meteorological Standards Expert Certification), G-3 (Statistical Standards Expert Certification), G-4 (Vulnerability Standards Expert Certification), G-5 (Actuarial Standards Expert Certification), G-6 (Computer Standards Expert Certification), and all independent peer reviews of the model under consideration will be reviewed. Signatories on the individual forms will be required to provide a description of their review process.
3. Discuss any incidents where modeling organization personnel or consultants have been found to have failed to abide by the standards of professional conduct adopted by their profession.

G-3 Risk Location*

*(*Significant Revision)*

- A. ZIP Codes used in the model shall not differ from the United States Postal Service publication date by more than 24 months at the date of submission of the model. ZIP Code information shall originate from the United States Postal Service.**
- B. ZIP Code centroids, when used in the model, shall be based on population data.**
- C. ZIP Code information purchased by the modeling organization shall be verified by the modeling organization for accuracy and appropriateness.**
- D. If any hazard or any model vulnerability components are dependent on ZIP Code databases, the modeling organization shall maintain a logical process for ensuring these components are consistent with the recent ZIP Code database updates.**
- E. Geocoding methodology shall be consistent and justifiable.**

Purpose: The ZIP Code information must be updated at least every two years. Interest in specific ZIP Codes arises in the context of logical relationship to risk or in projecting loss costs and probable maximum loss levels.

Model outputs, including loss costs, are sensitive to risk locations. Appropriate methods must be used in converting street addresses to geocode locations (latitude-longitude).

Relevant Form: G-1, General Standards Expert Certification

Disclosures

1. List the current ZIP Code databases used by the model and the components of the model to which they relate. Provide the effective (official United States Postal Service) date corresponding to the ZIP Code databases.
2. Describe in detail how invalid ZIP Codes are handled.
3. Describe the data, methods, and process used in the model to convert among street addresses, geocode locations (latitude-longitude), and ZIP Codes.
4. List and provide a brief description of each model ZIP Code-based database (e.g., ZIP Code centroids).
5. Describe the process for updating model ZIP Code-based databases.

Audit

1. Provide geographic displays for all ZIP Codes.
2. Provide geographic comparisons of previous to current locations of ZIP Code centroids.
3. Provide the third party vendor, if applicable, and a complete description of the process used to validate ZIP Code information.
4. The treatment of ZIP Code centroids over water or other uninhabitable terrain will be reviewed.
5. Examples of geocoding for complete and incomplete street addresses will be reviewed.
6. Examples of latitude-longitude to ZIP Code conversions will be reviewed.
7. Model ZIP Code-based databases will be reviewed.

G-4 Independence of Model Components

The meteorological, vulnerability, and actuarial components of the model shall each be theoretically sound without compensation for potential bias from the other two components.

Purpose: This standard requires that each of the three primary components be individually sound and operate independently. For example, the model shall not allow adjustments to the vulnerability components to compensate for apparent meteorological deficiencies (e.g., inflating damage to counteract for a deflated windfield). In addition to each component of the model meeting its respective standards, the interrelationship of the model components as a whole must be reasonable.

Relevant Form: G-1, General Standards Expert Certification

Audit

1. Demonstrate that the model components adequately portray hurricane phenomena and effects (damage, loss costs, and probable maximum loss levels). Attention will be paid to an assessment of (1) the theoretical soundness of each component and (2) the basis of their integration. For example, a model would not meet this standard if an artificial calibration adjustment had been made to improve the match of historical and model results for a specific hurricane.
2. Describe all changes in the model since the previous submission that might impact the independence of the model components.

G-5 Editorial Compliance

The submission and any revisions provided to the Commission throughout the review process shall be reviewed and edited by a person or persons with experience in reviewing technical documents who shall certify on Form G-7, Editorial Certification that the submission has been personally reviewed and is editorially correct.

Purpose: This standard requires that the modeling organization maintain a quality control process with regard to creating, maintaining, and reviewing all documentation associated with the model.

Person(s) with experience in reviewing technical documents for grammatical correctness, typographical accuracy, and inaccurate citations, charts, or graphs must have reviewed the submission and certify that the submission is in compliance with the acceptability process.

Relevant Forms: G-1, General Standards Expert Certification
G-2, Meteorological Standards Expert Certification
G-3, Statistical Standards Expert Certification
G-4, Vulnerability Standards Expert Certification
G-5, Actuarial Standards Expert Certification
G-6, Computer Standards Expert Certification
G-7, Editorial Certification

Disclosures

1. Describe the process used for document control of the submission. Describe the process used to ensure that the paper and electronic versions of specific files are identical in content.
2. Describe the process used by the signatories on Forms G-1 through G-6 (Standards Expert Certification forms) to ensure that the information contained under each set of standards is accurate and complete.
3. Provide a completed Form G-7, Editorial Certification. Provide a link to the location of the form here.

Audit

1. Demonstrate that the person or persons who have reviewed the submission has had experience in reviewing technical documentation and such person or persons is familiar with the submission requirements as set forth in the Commission's *Report of Activities as of November 1, 2013*.

2. Describe all changes to the submission document since the previously accepted submission that might impact the final document submission.
3. Demonstrate that the submission has been reviewed for grammatical correctness, typographical accuracy, completeness, and inclusion of extraneous data or materials.
4. Demonstrate that the submission has been reviewed by the signatories on Forms G-1 through G-6 (Standards Expert Certification forms) for accuracy and completeness.
5. The modification history for submission documentation will be reviewed.
6. A flowchart defining the process for form creation will be reviewed.
7. Form G-7 (Editorial Certification) will be reviewed.

Form G-1: General Standards Expert Certification

I hereby certify that I have reviewed the current submission of _____
(Name of Model)

Version _____ for compliance with the 2013 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the General Standards (G1 – G5);
- 2) The disclosures and forms related to the General Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession;
- 4) My review involved ensuring the consistency of the content in all sections of the submission; and
- 5) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Name

Professional Credentials (area of expertise)

Signature (original submission)

Date

Signature (response to deficiencies, if any)

Date

Signature (revisions to submission, if any)

Date

Signature (final submission)

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

Note: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

Form G-2: Meteorological Standards Expert Certification

I hereby certify that I have reviewed the current submission of _____
(Name of Model)

Version _____ for compliance with the 2013 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the Meteorological Standards (M1 – M6);
- 2) The disclosures and forms related to the Meteorological Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
- 4) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Name

Professional Credentials (area of expertise)

Signature (original submission)

Date

Signature (response to deficiencies, if any)

Date

Signature (revisions to submission, if any)

Date

Signature (final submission)

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

Note: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

Form G-3: Statistical Standards Expert Certification

I hereby certify that I have reviewed the current submission of _____
(Name of Model)

Version _____ for compliance with the 2013 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the Statistical Standards (S1 – S6);
- 2) The disclosures and forms related to the Statistical Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
- 4) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Name

Professional Credentials (area of expertise)

Signature (original submission)

Date

Signature (response to deficiencies, if any)

Date

Signature (revisions to submission, if any)

Date

Signature (final submission)

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

Note: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

Form G-4: Vulnerability Standards Expert Certification

I hereby certify that I have reviewed the current submission of _____
(Name of Model)

Version _____ for compliance with the 2013 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the Vulnerability Standards (V1 – V3);
- 2) The disclosures and forms related to the Vulnerability Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
- 4) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Name

Professional Credentials (area of expertise)

Signature (original submission)

Date

Signature (response to deficiencies, if any)

Date

Signature (revisions to submission, if any)

Date

Signature (final submission)

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

Note: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

Form G-5: Actuarial Standards Expert Certification

I hereby certify that I have reviewed the current submission of _____
(Name of Model)

Version _____ for compliance with the 2013 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the Actuarial Standards (A1 – A6);
- 2) The disclosures and forms related to the Actuarial Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the Actuarial Standards of Practice and Code of Conduct; and
- 4) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Name

Professional Credentials (area of expertise)

Signature (original submission)

Date

Signature (response to deficiencies, if any)

Date

Signature (revisions to submission, if any)

Date

Signature (final submission)

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

Note: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

Form G-6: Computer Standards Expert Certification

I hereby certify that I have reviewed the current submission of _____
(Name of Model)

Version _____ for compliance with the 2013 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

- 1) The model meets the Computer Standards (C1 – C7);
- 2) The disclosures and forms related to the Computer Standards section are editorially and technically accurate, reliable, unbiased, and complete;
- 3) My review was completed in accordance with the professional standards and code of ethical conduct for my profession; and
- 4) In expressing my opinion I have not been influenced by any other party in order to bias or prejudice my opinion.

Name

Professional Credentials (area of expertise)

Signature (original submission)

Date

Signature (response to deficiencies, if any)

Date

Signature (revisions to submission, if any)

Date

Signature (final submission)

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

Note: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

Form G-7: Editorial Certification

I/We hereby certify that I/we have reviewed the current submission of _____
(Name of Model)

Version _____ for compliance with the “Process for Determining the Acceptability of a Computer Simulation Model” adopted by the Florida Commission on Hurricane Loss Projection Methodology in its *Report of Activities as of November 1, 2013*, and hereby certify that:

- 1) The model submission is in compliance with the Commission’s Notification Requirements and General Standard G-5 (Editorial Compliance);
- 2) The disclosures and forms related to each standards section are editorially accurate and contain complete information and any changes that have been made to the submission during the review process have been reviewed for completeness, grammatical correctness, and typographical errors;
- 3) There are no incomplete responses, inaccurate citations, charts or graphs, or extraneous text or references;
- 4) The current version of the model submission has been reviewed for grammatical correctness, typographical errors, completeness, the exclusion of extraneous data/information and is otherwise acceptable for publication; and
- 5) In expressing my/our opinion I/we have not been influenced by any other party in order to bias or prejudice my/our opinion.

Name

Professional Credentials (area of expertise)

Signature (original submission)

Date

Signature (response to deficiencies, if any)

Date

Signature (revisions to submission, if any)

Date

Signature (final submission)

Date

An updated signature and form is required following any modification of the model and any revision of the original submission. If a signatory differs from the original signatory, provide the printed name and professional credentials for any new signatories. Additional signature lines shall be added as necessary with the following format:

Signature (revisions to submission)

Date

Note: A facsimile or any properly reproduced signature will be acceptable to meet this requirement.

METEOROLOGICAL STANDARDS

M-1 Base Hurricane Storm Set*

(*Significant Revision)

- A. Annual frequencies used in both model calibration and model validation shall be based upon the National Hurricane Center HURDAT2 starting at 1900 as of August 15, 2013 (or later). Complete additional season increments based on updates to HURDAT2 approved by the Tropical Prediction Center/National Hurricane Center are acceptable modifications to these storm sets. Peer reviewed atmospheric science literature can be used to justify modifications to the Base Hurricane Storm Set.**
- B. Any trends, weighting, or partitioning shall be justified and consistent with currently accepted scientific literature and statistical techniques. Calibration and validation shall encompass the complete Base Hurricane Storm Set as well as any partitions.**

Purpose: The Base Hurricane Storm Set covers the period 1900-2012. The primary use of this Base Hurricane Storm Set is in both calibration and validation of modeled versus historical hurricanes impacting Florida. Failure to update modeled landfall statistics based on changes in the Base Hurricane Storm Set through the 2012 hurricane season is not acceptable.

The National Hurricane Center periodically updates the online version of HURDAT2 incorporating the latest approved reanalysis updates, including the latest hurricane season, and other modifications to historical storms if an error has been discovered. Since the online database is the source for HURDAT2, a freeze date has been specified for the HURDAT2 version to be used. This freeze date represents the date HURDAT2 was downloaded from the website.

In 2013, new hurricane information was introduced into HURDAT2. These new data will be used as a reference for the modeling organization probability distributions. Variations between modeling organization hurricane characteristics and the new HURDAT2 fields are expected, and consistent deviations must be justified. Any variations in the track and intensity data from HURDAT2 must be justified as described in the standard.

Relevant Forms: G-2, Meteorological Standards Expert Certification
M-1, Annual Occurrence Rates
A-2, Base Hurricane Storm Set Statewide Losses
S-1, Probability and Frequency of Florida Landfalling Hurricanes per Year
S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled

Disclosures

1. Identify the Base Hurricane Storm Set, the release date, and the time period included to develop and implement landfall and by-passing hurricane frequencies into the model.
2. If the modeling organization has made any modifications to the Base Hurricane Storm Set related to landfall frequency and characteristics, provide justification for such modifications.
3. Where the model incorporates short-term or long-term modification of the historical data leading to differences between modeled climatology and that in the entire Base Hurricane Storm Set, describe how this is incorporated.
4. Provide a completed Form M-1, Annual Occurrence Rates. Provide a link to the location of the form here.

Audit

1. The modeling organization's Base Hurricane Storm Set will be reviewed.
2. Provide a flowchart illustrating how changes in the HURDAT2 database are used in the calculation of landfall distribution.
3. Changes to the modeling organization Base Hurricane Storm Set from the previously accepted submission will be reviewed. Any modification by the modeling organization to the information contained in HURDAT2 will be reviewed.
4. Reasoning and justification underlying any short-term and long-term variations in annual hurricane frequencies incorporated in the model will be reviewed.
5. Modeled probabilities will be compared with observed hurricane frequency using methods documented in currently accepted scientific literature. The goodness-of-fit of modeled to historical statewide and regional hurricane frequencies as provided in Form M-1 (Annual Occurrence Rates) will be reviewed.
6. Form M-1 (Annual Occurrence Rates) will be reviewed for consistency with Form S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year).
7. Comparisons of modeled probabilities and characteristics from the complete historical record will be reviewed. Modeled probabilities from any subset, trend, or fitted function will be reviewed, compared, and justified against the complete historical record. In the case of partitioning, modeled probabilities from the partition and its complement will be reviewed and compared with the complete historical record.

M-2 Hurricane Parameters and Characteristics

Methods for depicting all modeled hurricane parameters and characteristics, including but not limited to windspeed, radial distributions of wind and pressure, minimum central pressure, radius of maximum winds, landfall frequency, tracks, spatial and time variant windfields, and conversion factors, shall be based on information documented in currently accepted scientific literature.

Purpose: This standard requires that the modeling organization use only scientifically sound information for determining hurricane parameters and characteristics. The stochastic storm set shall include only hurricanes that have realistic hurricane characteristics. Any differences in the treatment of hurricane parameters between historical and stochastic storms shall be justified.

A hurricane parameter is an input (generally stochastic) to the model. Examples of hurricane parameters are radius to maximum wind, maximum wind, profile factor, and instantaneous speed and direction of motion. Hurricane characteristics are outputs of the model. Examples of hurricane characteristics are modeled windspeed at a particular location, track, and intensity variation.

Relevant Forms: G-2, Meteorological Standards Expert Certification
S-3, Distributions of Stochastic Hurricane Parameters

Disclosures

1. Identify the hurricane parameters (e.g., central pressure or radius of maximum winds) that are used in the model.
2. Describe the dependencies among variables in the windfield component and how they are represented in the model, including the mathematical dependence of modeled windfield as a function of distance and direction from the center position.
3. Identify whether hurricane parameters are modeled as random variables, as functions, or as fixed values for the stochastic storm set. Provide rationale for the choice of parameter representations.
4. Describe how any hurricane parameters are treated differently in the historical and stochastic storm sets (e.g., has a fixed value in one set and not the other).
5. State whether the model simulates surface winds directly or requires conversion between some other reference level or layer and the surface. Describe the source(s) of conversion factors and the rationale for their use. Describe the process for converting the modeled vortex winds to surface winds including the treatment of the inherent uncertainties in the conversion factor with respect to location of the site compared to

- the radius of maximum winds over time. Justify the variation in the surface winds conversion factor as a function of hurricane intensity and distance from the hurricane center.
6. Describe how the windspeeds generated in the windfield model are converted from sustained to gust and identify the averaging time.
 7. Describe the historical data used as the basis for the model's hurricane tracks. Discuss the appropriateness of the model stochastic hurricane tracks with reference to the historical hurricane database.
 8. If the historical data are partitioned or modified, describe how the hurricane parameters are affected.
 9. Describe how the coastline is segmented (or partitioned) in determining the parameters for hurricane frequency used in the model. Provide the hurricane frequency distribution by intensity for each segment.
 10. Describe any evolution of the functional representation of hurricane parameters during an individual storm life cycle.

Audit

1. All hurricane parameters used in the model will be reviewed.
2. Prepare graphical depictions of hurricane parameters as used in the model. Describe and justify:
 - a. The data set basis for the fitted distributions,
 - b. The modeled dependencies among correlated parameters in the windfield component and how they are represented,
 - c. The asymmetric nature of hurricanes,
 - d. The fitting methods used and any smoothing techniques employed.
3. The treatment of the inherent uncertainty in the conversion factor used to convert the modeled vortex winds to surface winds will be reviewed and compared with currently accepted scientific literature. Treatment of conversion factor uncertainty at a fixed time and location within the windfield for a given hurricane intensity will be reviewed.
4. Scientific literature cited in Standard G-1 (Scope of the Computer Model and Its Implementation) may be reviewed to determine applicability.
5. All external data sources that affect model generated windfields will be identified and their appropriateness will be reviewed.
6. Describe and justify the value(s) of the far-field pressure used in the model.

M-3 Hurricane Probabilities*

*(*Significant Revision)*

- A. Modeled probability distributions of hurricane parameters and characteristics shall be consistent with historical hurricanes in the Atlantic basin.**
- B. Modeled hurricane landfall frequency distributions shall reflect the Base Hurricane Storm Set used for category 1 to 5 hurricanes and shall be consistent with those observed for each coastal segment of Florida and neighboring states (Alabama, Georgia, and Mississippi).**
- C. Models shall use maximum one-minute sustained 10-meter windspeed when defining hurricane landfall intensity. This applies both to the Base Hurricane Storm Set used to develop landfall frequency distributions as a function of coastal location and to the modeled winds in each hurricane which causes damage. The associated maximum one-minute sustained 10-meter windspeed shall be within the range of windspeeds (in statute miles per hour) categorized by the Saffir-Simpson Scale.**

Saffir-Simpson Hurricane Scale:

Category	Winds (mph)	Damage
1	74 – 95	Minimal
2	96 – 110	Moderate
3	111 – 129	Extensive
4	130 – 156	Extreme
5	157 or higher	Catastrophic

Purpose: This standard requires that the modeled probability distributions of hurricane parameters and characteristics be consistent with those documented in currently accepted scientific literature. Consistent means that spatial distributions of modeled hurricane probabilities accurately depict those of vulnerable coastlines in Florida and adjacent states.

The probability of occurrence of hurricanes shall reasonably reflect the historical record with respect to intensities and geographical locations. Extension beyond Florida’s boundaries demonstrates continuity of methodology.

Relevant Forms: G-2, Meteorological Standards Expert Certification
M-1, Annual Occurrence Rates

- A-2, Base Hurricane Storm Set Statewide Losses
- S-1, Probability and Frequency of Florida Landfalling Hurricanes per Year
- S-3, Distributions of Stochastic Hurricane Parameters

Disclosures

1. List assumptions used in creating the hurricane characteristic databases.
2. Provide a brief rationale for the probability distributions used for all hurricane parameters and characteristics.

Audit

1. Demonstrate that the quality of fit extends beyond the Florida border by showing results for appropriate coastal segments in Alabama, Georgia, and Mississippi.
2. Describe and support the method of selecting stochastic storm tracks.
3. Describe and support the method of selecting storm track strike intervals. If strike locations are on a discrete set, show the landfall points for major metropolitan areas in Florida.
4. Provide any modeling organization specific research performed to develop the functions used for simulating model variables or to develop databases.
5. Form S-3 (Distributions of Stochastic Hurricane Parameters) will be reviewed for the probability distributions and data sources.

M-4 Hurricane Windfield Structure*

*(*Significant Revision)*

- A. Windfields generated by the model shall be consistent with observed historical storms affecting Florida.**
- B. The land use and land cover database shall be consistent with National Land Cover Database (NLCD) 2006 or later. Use of alternate data sets shall be justified.**
- C. The translation of land use and land cover or other source information into a surface roughness distribution shall be consistent with current state-of-the-science and shall be implemented with appropriate geographic information system data.**
- D. With respect to multi-story buildings, the model windfield shall account for the effects of the vertical variation of winds if not accounted for in the vulnerability functions.**

Purpose: This standard requires that the windfield model be implemented consistently with a contemporary land use and land cover distribution and with the vertical distribution of the hurricane boundary layer windfield where applicable. The resulting surface windfield shall be representative of historical storms in Florida and adjacent states.

Note: The NLCD products are created by the Multi-Resolution Land Characteristics (MRLC) Consortium, a partnership of Federal agencies led by the U.S. Geological Survey (USGS) and are updated every five years.

The methodology for treating both historical and stochastic storm sets is to be documented, including any variations between these storm sets.

Relevant Forms: G-2, Meteorological Standards Expert Certification
M-2, Maps of Maximum Winds
A-2, Base Hurricane Storm Set Statewide Losses

Disclosures

1. Provide a rotational windspeed (y-axis) versus radius (x-axis) plot of the average or default symmetric wind profile used in the model and justify the choice of this wind profile.
2. If the model windfield has been modified in any way from the previous submission, provide a rotational windspeed (y-axis) versus radius (x-axis) plot of the average or default symmetric wind profile for both the new and old functions. The choice of average or default shall be consistent for the new and old functions.

3. If the model windfield has been modified in any way from the previous submission, describe variations between the new and old windfield functions with reference to historical storms.
4. Describe how the vertical variation of winds is accounted for in the model where applicable. Document and justify any difference in the methodology for treating historical and stochastic storm sets.
5. Describe the relevance of the formulation of gust factor(s) used in the model.
6. Identify all non-meteorological variables that affect windspeed estimation (e.g., surface roughness, topography, etc.).
7. Provide the collection and publication dates of the land use and land cover data used in the model and justify their timeliness for Florida.
8. Describe the methodology used to convert land use and land cover information into a spatial distribution of roughness coefficients in Florida and adjacent states.
9. Demonstrate the consistency of the spatial distribution of model-generated winds with observed windfields for hurricanes affecting Florida. Describe and justify the appropriateness of the databases used in the windfield validations.
10. Describe how the model's windfield is consistent with the inherent differences in windfields for such diverse hurricanes as Hurricane Charley (2004), Hurricane Jeanne (2004), and Hurricane Wilma (2005).
11. Describe any variations in the treatment of the model windfield for stochastic versus historical storms and justify this variation.
12. Provide a completed Form M-2, Maps of Maximum Winds. Explain the differences between the spatial distributions of maximum winds for open terrain and actual terrain for historical storms. Provide a link to the location of the form here.

Audit

1. Provide any modeling organization-specific research performed to develop the windfield functions used in the model. Identify the databases used.
2. Provide any modeling organization-specific research performed to derive the roughness distributions for Florida and adjacent states.
3. The spatial distribution of surface roughness used in the model will be reviewed.
4. Provide the previous and current hurricane parameters used in calculating the loss costs for the LaborDay03 (1935) and NoName09 (1945) landfalls, and justify the choices used. Provide the resulting spatial distribution of winds. These will be reviewed with Form A-2 (Base Hurricane Storm Set Statewide Losses).

5. For windfields not previously reviewed, provide detailed comparisons of the model windfield with Hurricane Charley (2004), Hurricane Jeanne (2004), and Hurricane Wilma (2005).
6. For windfield and pressure distributions not previously reviewed, present time-based contour animations (capable of being paused) to demonstrate scientifically reasonable windfield characteristics.
7. The effects of vertical variation of winds as used in the model where applicable will be reviewed.
8. Form M-2 (Maps of Maximum Winds) will be reviewed.

M-5 Landfall and Over-Land Weakening Methodologies*

*(*Significant Revision)*

- A. The hurricane over-land weakening rate methodology used by the model shall be consistent with historical records and with current state-of-the-science.**
- B. The transition of winds from over-water to over-land within the model shall be consistent with current state-of-the-science.**

Purpose: This standard ensures that the required evaluation of intensity at landfall, weakening of hurricanes over-land, and the transition of winds from ocean to land is consistent with up-to-date depictions of appropriate surface characteristics.

Relevant Form: G-2, Meteorological Standards Expert Certification

Disclosures

1. Describe and justify the functional form of hurricane decay rates used by the model.
2. Provide a graphical representation of the modeled decay rates for Florida hurricanes over time compared to wind observations.
3. Describe the transition from over-water to over-land boundary layer simulated in the model.
4. Describe any changes in hurricane parameters, other than intensity, resulting from the transition from over-water to over-land.
5. Describe the representation in the model of passage over non-continental U.S. land masses on hurricanes affecting Florida.
6. Document any differences in the treatment of decay rates in the model for stochastic hurricanes compared to historical hurricanes affecting Florida.

Audit

1. Describe the variation in over-land decay rates used in the model.
2. Comparisons of the model's weakening rates to weakening rates for historical Florida hurricanes will be reviewed.
3. The detailed transition of winds from over-water to over-land (i.e., landfall, boundary layer) will be reviewed. The region within 5 miles of the coast will be emphasized. Provide color-coded snapshot maps of roughness length and spatial distribution of

over-land and over-water windspeeds for Hurricane Jeanne (2004), Hurricane Dennis (2005), and Hurricane Andrew (1992) at the closest time after landfall.

M-6 Logical Relationships of Hurricane Characteristics

A. The magnitude of asymmetry shall increase as the translation speed increases, all other factors held constant.

B. The mean windspeed shall decrease with increasing surface roughness (friction), all other factors held constant.

Purpose: This standard requires the modeling organization to demonstrate physical consistency of the model windfield.

Relevant Forms: G-2, Meteorological Standards Expert Certification
M-3, Radius of Maximum Winds and Radii of Standard Wind
Thresholds

Disclosures

1. Describe how the asymmetric structure of hurricanes is represented in the model.
2. Provide a completed Form M-3, Radius of Maximum Winds and Radii of Standard Wind Thresholds. Provide a link to the location of the form here.
3. Discuss the radii values for each wind threshold in Form M-3 (Radius of Maximum Winds and Radii of Standard Wind Thresholds) with reference to available hurricane observations such as those in HURDAT2. Justify the appropriateness of the databases used in the radii validations.

Audit

1. Form M-3 (Radius of Maximum Winds and Radii of Standard Wind Thresholds) and the modeling organization's sensitivity analyses provide the information used in auditing this standard.
2. Justify the relationship between central pressure and radius of maximum winds.
3. Justify the variation of the asymmetry with the translation speed.

Form M-1: Annual Occurrence Rates

- A. Provide annual occurrence rates for landfall from the data set defined by marine exposure that the model generates by hurricane category (defined by maximum windspeed at landfall in the Saffir-Simpson scale) for the entire state of Florida and selected regions as defined in *Figure 3*. List the annual occurrence rate per hurricane category. Annual occurrence rates shall be rounded to two decimal places. The historical frequencies below have been derived from the Base Hurricane Storm Set as defined in Standard M-1 (Base Hurricane Storm Set).
- B. Describe model variations from the historical frequencies.
- C. Provide vertical bar graphs depicting distributions of hurricane frequencies by category by region of Florida (*Figure 3*) and for the neighboring states of Alabama/Mississippi and Georgia. For the neighboring states, statistics based on the closest milepost to the state boundaries used in the model are adequate.
- D. If the data are partitioned or modified, provide the historical annual occurrence rates for the applicable partition (and its complement) or modification as well as the modeled annual occurrence rates in additional copies of Form M-1 (Annual Occurrence Rates).
- E. List all hurricanes added, removed, or modified from the previously accepted submission version of the Base Hurricane Storm Set.
- F. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form M-1 (Annual Occurrence Rates) shall also be included in a submission appendix.

Note: Except where specified, Number of Hurricanes does not include By-Passing Hurricanes. Each time a hurricane goes from water to land (once per region) it is counted as a landfall in that region. However, each hurricane is counted only once in the Entire State totals. Hurricanes recorded for adjacent states need not have reported damaging winds in Florida.

Form M-1 (Annual Occurrence Rates), Form A-2 (Base Hurricane Storm Set Statewide Losses), and Form S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year) are based on the 113 year period 1900-2012 (consistent with Standard M-1, Base Hurricane Storm Set). It is intended that the storm set underlying Forms M-1 (Annual Occurrence Rates), A-2 (Base Hurricane Storm Set Statewide Losses), and S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year) will be the same. As specified in Standard M-1 (Base Hurricane Storm Set), the modeling organization may exclude hurricanes that caused zero modeled damage, or include additional complete hurricane seasons, or may modify data for historical storms based on evidence in the peer-reviewed scientific literature. This may result in the modeling organization including additional landfalls in Florida and adjacent states to those listed in Form A-2 (Base Hurricane Storm Set Statewide Losses) for Florida or counted in Form M-1 (Annual Occurrence Rates) in the case of adjacent states. In this situation, the historical numbers in Form M-1 (Annual Occurrence Rates) should be updated to agree with the modeling organization Base Hurricane Storm Set. Any additional *Florida* hurricanes should be included in

Form A-2 (Base Hurricane Storm Set Statewide Losses) as instructed there, and the historical landfall counts in Form S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year) should be updated.

In some circumstances, the modeling organization windfield reconstruction of a historical storm may indicate that it is a by-passing hurricane (the modeling organization windfield results in damaging winds somewhere in the state). In this situation, the historical numbers in Form M-1 (Annual Occurrence Rates) should be updated to agree with the modeling organization Base Hurricane Storm Set, but no changes are required for Form A-2 (Base Hurricane Storm Set Statewide Losses) or Form S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year).

Annual Occurrence Rates

Category	Entire State				Region A – NW Florida			
	Historical		Modeled		Historical		Modeled	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	23	0.20			15	0.13		
2	14	0.12			5	0.04		
3	18	0.16			5	0.04		
4	8	0.07			0	0.00		
5	2	0.02			0	0.00		

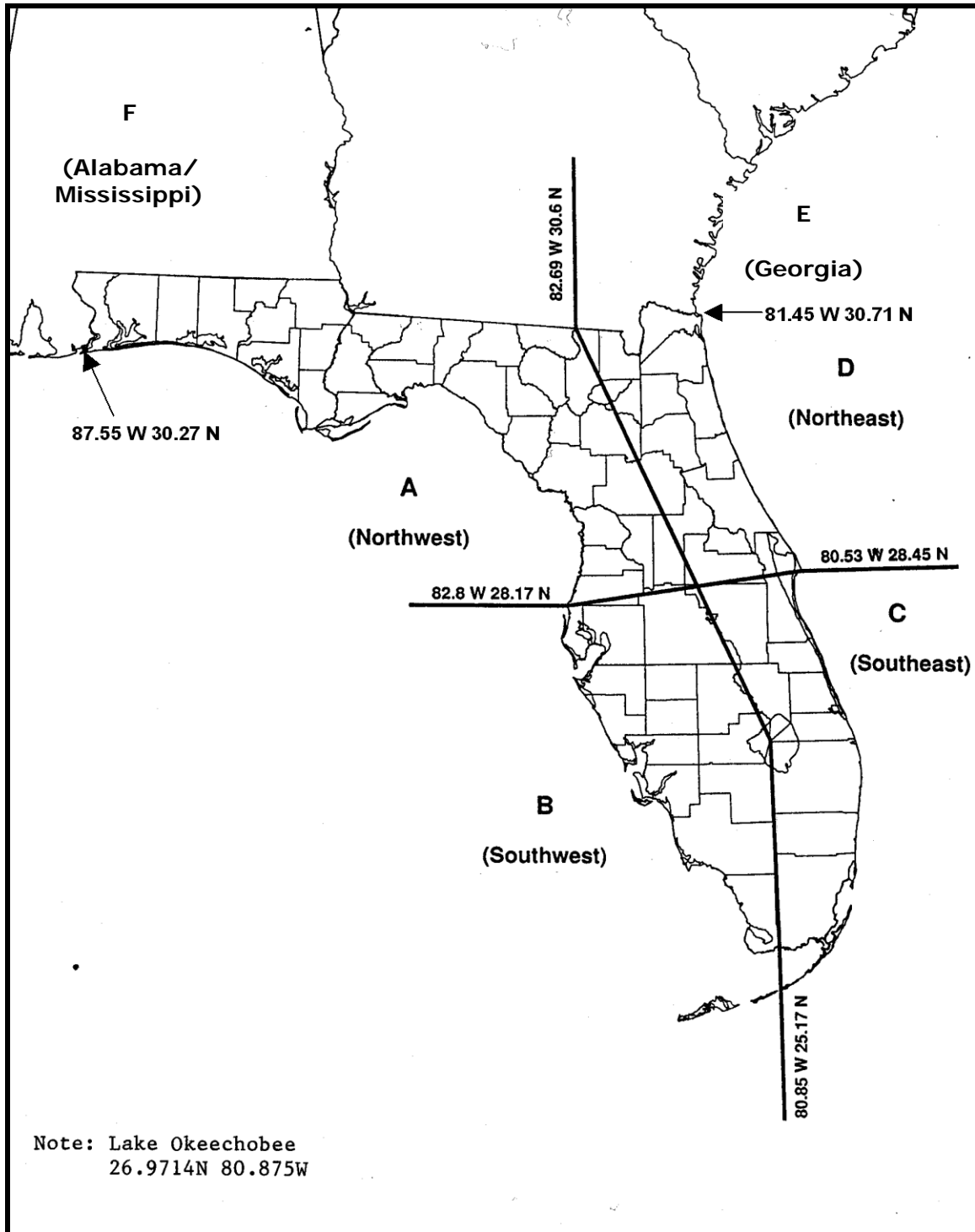
Category	Region B – SW Florida				Region C – SE Florida			
	Historical		Modeled		Historical		Modeled	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	7	0.06			6	0.05		
2	2	0.02			6	0.05		
3	7	0.06			7	0.06		
4	3	0.03			5	0.04		
5	1	0.01			1	0.01		

Category	Region D – NE Florida				Florida By-Passing Hurricanes			
	Historical		Modeled		Historical		Modeled	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	1	0.01			3	0.03		
2	2	0.02			5	0.04		
3	0	0.00			3	0.03		
4	0	0.00			0	0.00		
5	0	0.00			0	0.00		

Category	Region E – Georgia				Region F – Alabama/Mississippi			
	Historical		Modeled		Historical		Modeled	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	3	0.03			7	0.06		
2	0	0.00			4	0.04		
3	0	0.00			5	0.04		
4	0	0.00			1	0.01		
5	0	0.00			1	0.01		

Figure 3

State of Florida and Neighboring States By Region



Form M-2: Maps of Maximum Winds

- A. Provide color maps of the maximum winds for the modeled version of the Base Hurricane Storm Set for land use as set for open terrain and land use set for actual terrain as defined by the modeling organization.
- B. Provide color maps of the maximum winds for a 100-year and a 250-year return period from the stochastic storm set for both open terrain and actual terrain.
- C. Plot the position and values of the maximum windspeeds on each contour map.

Actual terrain is the roughness distribution used in the standard version of the model. Open terrain uses the same roughness value of 0.03 meters at all land points.

All maps shall be color coded at the ZIP Code level.

Maximum winds in these maps are defined as the maximum one-minute sustained winds over the terrain as modeled and recorded at each location.

The same color scheme and increments shall be used for all maps.

Use the following eight isotach values and interval color coding:

(1)	Minimum damaging	Blue
(2)	50 mph	Medium Blue
(3)	65 mph	Light Blue
(4)	80 mph	White
(5)	95 mph	Light Red
(6)	110 mph	Medium Red
(7)	125 mph	Red
(8)	140 mph	Magenta

Contouring in addition to these isotach values may be included.

Form M-3: Radius of Maximum Winds and Radii of Standard Wind Thresholds

- A. For the central pressures in the table below, provide the minimum and maximum values for (1) the radius of maximum winds (Rmax) used by the model to create the stochastic storm set, and the minimum and maximum values for the outer radii (R) of (2) Category 3 winds (>110 mph), (3) Category 1 winds (>73 mph), and (4) gale force winds (>40 mph). This information should be readily calculated from the windfield formula input to the model and does not require running the stochastic storm set. Describe the procedure used to complete this form.
- B. Identify the other variables that influence Rmax.
- C. Provide a box plot and histogram of Central Pressure (*x*-axis) versus Rmax (*y*-axis) to demonstrate relative populations and continuity of sampled hurricanes in the stochastic storm set.
- D. Provide this form in Excel using the format given in the file named “2013FormM3.xlsx.” The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form M-3 (Radius of Maximum Winds and Radii of Standard Wind Thresholds) shall also be included in a submission appendix.

Central Pressure (mb)	Rmax (mi)		Outer Radii (>110 mph) (mi)		Outer Radii (>73 mph) (mi)		Outer Radii (>40 mph) (mi)	
	Min	Max	Min	Max	Min	Max	Min	Max
990								
980								
970								
960								
950								
940								
930								
920								
910								
900								

STATISTICAL STANDARDS

S-1 Modeled Results and Goodness-of-Fit

- A. The use of historical data in developing the model shall be supported by rigorous methods published in currently accepted scientific literature.***
- B. Modeled and historical results shall reflect statistical agreement using currently accepted scientific and statistical methods for the academic disciplines appropriate for the various model components or characteristics.***

Purpose: Many aspects of model development and implementation involve fitting a probability distribution to historical data for use in generating stochastic storms. Such fitted models shall be checked to ensure that the distributions are reasonable. The chi-square goodness-of-fit test may not be a rigorous methodology for demonstrating the reasonableness of models of historical data.

This standard explicitly requires the modeling organization to have the results of data fitting with probability distributions available for the model assessments. Also, this standard requires the production of graphical and numerical statistical summaries by the modeling organization in advance of an audit (which could have the desirable effect in a self-audit of identifying potential problem areas).

Relevant Forms: G-3, Statistical Standards Expert Certification
M-1, Annual Occurrence Rates
S-1, Probability and Frequency of Florida Landfalling Hurricanes per Year
S-2A, Examples of Loss Exceedance Estimates (2007 FHCF Exposure Data)
S-2B, Examples of Loss Exceedance Estimates (2012 FHCF Exposure Data)
S-3, Distributions of Stochastic Hurricane Parameters
S-4, Validation Comparisons
S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled

Disclosures

1. Identify the form of the probability distributions used for each function or variable, if applicable. Identify statistical techniques used for the estimates and the specific goodness-of-fit tests applied. Describe whether the p -values associated with the fitted distributions provide a reasonable agreement with the historical data. Provide a

- completed Form S-3, Distributions of Stochastic Hurricane Parameters. Provide a link to the location of the form here.
2. Describe the nature and results of the tests performed to validate the windspeeds generated.
 3. Provide the date of loss of the insurance company data available for validation and verification of the model.
 4. Provide an assessment of uncertainty in loss costs for output ranges using confidence intervals or other accepted scientific characterizations of uncertainty.
 5. Justify any differences between the historical and modeled results using current accepted scientific and statistical methods in the appropriate disciplines.
 6. Provide graphical comparisons of modeled and historical data and goodness-of-fit tests. Examples include hurricane frequencies, tracks, intensities, and physical damage.
 7. Provide a completed Form S-1, Probability and Frequency of Florida Landfalling Hurricanes per Year. Provide a link to the location of the form here.
 8. Provide a completed Form S-2A, Examples of Loss Exceedance Estimates, using the 2007 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data. Provide a link to the location of the form here.
 9. Provide a completed Form S-2B, Examples of Loss Exceedance Estimates, using the 2012 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data. Provide a link to the location of the form here.

Audit

1. Forms S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year), S-2A (Examples of Loss Exceedance Estimates, 2007 FHCF Exposure Data), S-2B (Examples of Loss Exceedance Estimates, 2012 FHCF Exposure Data), and S-3 (Distributions of Stochastic Hurricane Parameters) will be reviewed. Provide justification for the distributions selected including, for example, citations to published literature or analyses of specific historical data.
2. The modeling organization's characterization of uncertainty for windspeed, damage estimates, annual loss, and loss costs will be reviewed.

S-2 Sensitivity Analysis for Model Output

The modeling organization shall have assessed the sensitivity of temporal and spatial outputs with respect to the simultaneous variation of input variables using currently accepted scientific and statistical methods in the appropriate disciplines and have taken appropriate action.

Purpose: Sensitivity analysis goes beyond mere quantification of the magnitude of the output (e.g., windspeed, loss cost, etc.) by identifying and quantifying the input variables that impact the magnitude of the output when the input variables are varied simultaneously. The simultaneous variation of all input variables enables the modeling organization to detect interactions and to properly account for correlations among the input variables. Neither of these goals can be achieved by using one-factor-at-a-time variation, hence such an approach to sensitivity analysis does not lead to an understanding of how the input variables jointly affect the model output. The simultaneous variation of the input variables is an important diagnostic tool and provides needed assurance of the robustness and viability of the model output.

Relevant Forms: G-3, Statistical Standards Expert Certification
S-6, Hypothetical Events for Sensitivity and Uncertainty Analysis

Disclosures

1. Identify the most sensitive aspect of the model and the basis for making this determination. Provide a full discussion of the degree to which these sensitivities affect output results and illustrate with an example.
2. Describe how other aspects of the model may have a significant impact on the sensitivities in output results and the basis for making this determination.
3. Describe and justify action or inaction as a result of the sensitivity analyses performed.
4. Provide a completed Form S-6, Hypothetical Events for Sensitivity and Uncertainty Analysis. (Requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis. For models previously found acceptable, the Commission will determine, at the meeting to review modeling organization submissions, if an existing modeling organization will be required to provide Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) prior to the Professional Team on-site review). If applicable, provide a link to the location of the form here.

Audit

1. The modeling organization's sensitivity analysis will be reviewed in detail. Statistical

techniques used to perform sensitivity analysis shall be explicitly stated. The results of the sensitivity analysis displayed in graphical format (e.g., contour plots with temporal animation) will be reviewed.

2. Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) will be reviewed, if applicable.

S-3 Uncertainty Analysis for Model Output

The modeling organization shall have performed an uncertainty analysis on the temporal and spatial outputs of the model using currently accepted scientific and statistical methods in the appropriate disciplines and have taken appropriate action. The analysis shall identify and quantify the extent that input variables impact the uncertainty in model output as the input variables are simultaneously varied.

Purpose: Modeling organizations have traditionally quantified the magnitude of the uncertainty in the output (e.g., windspeed, loss cost, etc.) through a variance calculation or by use of confidence intervals. While these statistics provide useful information, uncertainty analysis goes beyond a mere quantification of these statistics by quantifying the expected percentage reduction in the variance of the output that is attributable to each of the input variables. Identification of those variables that contribute to the uncertainty is the first step that can lead to a reduction in the uncertainty in the output. It is important to note that the input variables identified in an uncertainty analysis are not necessarily the same as those in a sensitivity analysis nor are they necessarily in the same relative order. As with sensitivity analysis, uncertainty analysis is an important diagnostic tool and provides needed assurance of the robustness and viability of the model output.

Relevant Forms: G-3, Statistical Standards Expert Certification
S-6, Hypothetical Events for Sensitivity and Uncertainty Analysis

Disclosures

1. Identify the major contributors to the uncertainty in model outputs and the basis for making this determination. Provide a full discussion of the degree to which these uncertainties affect output results and illustrate with an example.
2. Describe how other aspects of the model may have a significant impact on the uncertainties in output results and the basis for making this determination.
3. Describe and justify action or inaction as a result of the uncertainty analyses performed.
4. Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis), if disclosed under Standard S-2 (Sensitivity Analysis for Model Output), will be used in the verification of Standard S-3 (Uncertainty Analysis for Model Output).

Audit

1. The modeling organization's uncertainty analysis will be reviewed in detail. Statistical techniques used to perform uncertainty analysis shall be explicitly stated.

The results of the uncertainty analysis displayed in graphical format (e.g., contour plots with temporal animation) will be reviewed.

2. Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) will be reviewed, if applicable.

S-4 County Level Aggregation

At the county level of aggregation, the contribution to the error in loss cost estimates attributable to the sampling process shall be negligible.

Purpose: The intent of this standard is to ensure that sufficient runs of the simulation have been made or a suitable sampling design invoked so that the contribution to the error of the loss cost estimates due to its probabilistic nature is negligible. To be negligible, the standard error of each output range shall be less than 2.5% of the loss cost estimate.

Relevant Form: G-3, Statistical Standards Expert Certification

Disclosure

1. Describe the sampling plan used to obtain the average annual loss costs and output ranges. For a direct Monte Carlo simulation, indicate steps taken to determine sample size. For an importance sampling design, describe the underpinnings of the design.

Audit

1. Provide a graph assessing the accuracy associated with a low impact area such as Nassau County. We would expect that if the contribution error in an area such as Nassau County is small, the error in the other areas would be small as well. Assess where appropriate, the contribution of simulation uncertainty via confidence intervals.

S-5 Replication of Known Hurricane Losses

The model shall estimate incurred losses in an unbiased manner on a sufficient body of past hurricane events from more than one company, including the most current data available to the modeling organization. This standard applies separately to personal residential and, to the extent data are available, to commercial residential. Personal residential experience may be used to replicate structure-only and contents-only losses. The replications shall be produced on an objective body of loss data by county or an appropriate level of geographic detail and shall include loss data from both 2004 and 2005.

Purpose: Each model shall reasonably replicate past known events for hurricane frequency and severity. The Meteorological Standards assess the model's hurricane frequency projections and hurricane tracks. This standard applies to severity or the combined effects of windfield, vulnerability functions, and insurance loss limitations. To the extent possible, each of the three functions of windfield, vulnerability, and insurance shall be separately tested and verified.

Given a past hurricane event and a book of insured properties at the time of the hurricane, the model shall be able to provide expected losses.

Relevant Forms: G-3, Statistical Standards Expert Certification
S-4, Validation Comparisons

Disclosures

1. Describe the nature and results of the analyses performed to validate the loss projections generated by the model for personal and commercial residential separately. Include analyses for the 2004 and 2005 hurricane seasons.
2. Provide a completed Form S-4, Validation Comparisons. Provide a link to the location of the form here.

Audit

1. The following information for each insurer and hurricane will be reviewed:
 - a. The validity of the model assessed by comparing expected losses produced by the model to actual observed losses incurred by insurers at both the state and county level,
 - b. The version of the model used to calculate modeled losses for each hurricane provided,
 - c. A general description of the data and its source,
 - d. A disclosure of any material mismatch of exposure and loss data problems, or other material consideration,

- e. The date of the exposures used for modeling and the date of the hurricane,
 - f. An explanation of differences in the actual and modeled hurricane parameters,
 - g. A listing of the departures, if any, in the windfield applied to a particular hurricane for the purpose of validation and the windfield used in the model under consideration,
 - h. The type of property used in each hurricane to address:
 - (1) Personal versus commercial
 - (2) Residential structures
 - (3) Mobile homes
 - (4) Commercial residential
 - (5) Condominiums
 - (6) Structures only
 - (7) Contents only,
 - i. The inclusion of demand surge, storm surge, loss adjustment expenses, or law and ordinance coverage in the actual losses or the modeled losses.
2. The following documentation will be reviewed:
- a. Publicly available documentation referenced in the submission,
 - b. The data sources excluded from validation and the reasons for excluding the data from review by the Commission (if any),
 - c. An analysis that identifies and explains anomalies observed in the validation data,
 - d. User input sheets for each insurer and hurricane detailing specific assumptions made with regard to exposed property.
3. The confidence intervals used to gauge the comparison between historical and modeled losses will be reviewed.
4. Form S-4 (Validation Comparisons) will be reviewed.
5. The results of one hurricane event for more than one insurance company and the results from one insurance company for more than one hurricane event will be reviewed to the extent data are available.

S-6 Comparison of Projected Hurricane Loss Costs

The difference, due to uncertainty, between historical and modeled annual average statewide loss costs shall be reasonable, given the body of data, by established statistical expectations and norms.

Purpose: This standard requires various demonstrations that the differences between historical and modeled annual average statewide loss costs are plausible from a statistical perspective.

Relevant Forms: G-3, Statistical Standards Expert Certification
S-5, Average Annual Zero Deductible Statewide Loss Costs –
Historical versus Modeled

Disclosures

1. Describe the nature and results of the tests performed to validate the expected loss projections generated. If a set of simulated hurricanes or simulation trials was used to determine these loss projections, specify the convergence tests that were used and the results. Specify the number of hurricanes or trials that were used.
2. Identify and justify differences, if any, in how the model produces loss costs for specific historical events versus loss costs for events in the stochastic hurricane set.
3. Provide a completed Form S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled. Provide a link to the location of the form here.

Audit

1. Form S-5 (Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled) will be reviewed for consistency with Standard G-1 (Scope of the Computer Model and Its Implementation), Disclosure 5.
2. Justify the following:
 - a. Meteorological parameters,
 - b. The effect of by-passing hurricanes,
 - c. The effect of actual hurricanes that had two landfalls impacting Florida,
 - d. The departures, if any, from the windfield, vulnerability functions, or insurance functions applied to the actual hurricanes for the purposes of this test and those used in the model under consideration,
 - e. Exposure assumptions.

Form S-1: Probability and Frequency of Florida Landfalling Hurricanes per Year

Complete the table below showing the probability and modeled frequency of landfalling Florida hurricanes per year. Modeled probability shall be rounded to four decimal places. The historical probabilities and frequencies below have been derived from the Base Hurricane Storm Set for the 113 year period 1900-2012 (as given in Form A-2, Base Hurricane Storm Set Statewide Losses). Exclusion of hurricanes that caused zero modeled Florida damage or additional Florida landfalls included in the modeling organization Base Hurricane Storm Set as identified in their response to Standard M-1 (Base Hurricane Storm Set) should be used to adjust the historical probabilities and frequencies provided here.

If the data are partitioned or modified, provide the historical probabilities and frequencies for the applicable partition (and its complement) or modification as well as the modeled probabilities and frequencies in additional copies of Form S-1 (Probability and Frequency of Florida Landfalling Hurricanes per Year).

Model Results Probability and Frequency of Florida Landfalling Hurricanes per Year

Number Of Hurricanes Per Year	Historical Probabilities	Modeled Probabilities	Historical Frequencies	Modeled Frequencies
0	0.6018		68	
1	0.2478		28	
2	0.1239		14	
3	0.0265		3	
4	0.0000		0	
5	0.0000		0	
6	0.0000		0	
7	0.0000		0	
8	0.0000		0	
9	0.0000		0	
10 or more	0.0000		0	

**Form S-2A: Examples of Loss Exceedance Estimates
(2007 FHCF Exposure Data)**

Provide projections of the aggregate personal and commercial insured losses for various probability levels using the notional risk data set specified in Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code) and using the 2007 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data provided in the file named "hlpm2007c.exe." Provide the total average annual loss for the loss exceedance distribution. If the modeling methodology does not allow the model to produce a viable answer, please state so and why.

Part A

Return Period (years)	Probability of Exceedance	Estimated Loss Notional Risk Data Set	Estimated Personal and Commercial Residential Loss FHCF Data Set
Top Event	N/A	_____	_____
10,000	0.01%	_____	_____
5,000	0.02%	_____	_____
2,000	0.05%	_____	_____
1,000	0.10%	_____	_____
500	0.20%	_____	_____
250	0.40%	_____	_____
100	1.00%	_____	_____
50	2.00%	_____	_____
20	5.00%	_____	_____
10	10.00%	_____	_____
5	20.00%	_____	_____

Part B

Mean (Total Average Annual Loss)	_____	_____
Median	_____	_____
Standard Deviation	_____	_____
Interquartile Range	_____	_____
Sample Size	_____	_____

**Form S-2B: Examples of Loss Exceedance Estimates
(2012 FHCF Exposure Data)**

Provide projections of the aggregate personal and commercial insured losses for various probability levels using the notional risk data set specified in Form A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code) and using the 2012 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data provided in the file named "hlpm2012c.exe." Provide the total average annual loss for the loss exceedance distribution. If the modeling methodology does not allow the model to produce a viable answer, please state so and why.

Part A

Return Period (years)	Probability of Exceedance	Estimated Loss Notional Risk Data Set	Estimated Personal and Commercial Residential Loss FHCF Data Set
Top Event	N/A	_____	_____
10,000	0.01%	_____	_____
5,000	0.02%	_____	_____
2,000	0.05%	_____	_____
1,000	0.10%	_____	_____
500	0.20%	_____	_____
250	0.40%	_____	_____
100	1.00%	_____	_____
50	2.00%	_____	_____
20	5.00%	_____	_____
10	10.00%	_____	_____
5	20.00%	_____	_____

Part B

Mean (Total Average Annual Loss)	_____	_____
Median	_____	_____
Standard Deviation	_____	_____
Interquartile Range	_____	_____
Sample Size	_____	_____

Form S-4: Validation Comparisons

- A. Provide five validation comparisons of actual personal residential exposures and loss to modeled exposures and loss. These comparisons must be provided by line of insurance, construction type, policy coverage, county or other level of similar detail in addition to total losses. Include loss as a percent of total exposure. Total exposure represents the total amount of insured values (all coverages combined) in the area affected by the hurricane. This would include exposures for policies that did not have a loss. If this is not available, use exposures for only those policies that had a loss. Specify which was used. Also, specify the name of the hurricane event compared.

- B. Provide a validation comparison of actual commercial residential exposures and loss to modeled exposures and loss. Use and provide a definition of the model's relevant commercial residential classifications.

- C. Provide scatter plot(s) of modeled vs. historical losses for each of the required validation comparisons. (Plot the historical losses on the *x*-axis and the modeled losses on the *y*-axis.)

Rather than using directly a specific published hurricane windfield, the winds underlying the modeled loss cost calculations must be produced by the model being evaluated and should be the same hurricane parameters as used in completing Form A-2 (Base Hurricane Storm Set Statewide Losses).

Example Formats for Personal Residential:

Hurricane = _____
 Exposure = Total exposure or loss only (please specify) _____

Construction	Company Actual Loss / Exposure	Modeled Loss / Exposure	Difference
Wood Frame			
Masonry			
Other (specify)			
Total			

Hurricane = _____
 Exposure = Total exposure or loss only (please specify) _____

Coverage	Company Actual Loss / Exposure	Modeled Loss / Exposure	Difference
A			
B			
C			
D			
Total			

Example Format for Commercial Residential:

Hurricane = _____

Exposure = Total exposure or loss only (please specify) _____

Construction	Company Actual Loss / Exposure	Modeled Loss / Exposure	Difference
Total			

**Form S-5: Average Annual Zero Deductible Statewide
Loss Costs – Historical versus Modeled**

Part A

- A. Provide the average annual zero deductible statewide personal and commercial residential loss costs produced using the list of hurricanes in the Base Hurricane Storm Set as defined in Standard M-1 (Base Hurricane Storm Set) based on the 2007 Florida Hurricane Catastrophe Fund’s aggregate personal and commercial residential exposure data found in the file named “*hlpm2007c.exe*.”

**Average Annual Zero Deductible Statewide Personal and
Commercial Residential Loss Costs**

Time Period – 2007 FHCF Exposure Data	Historical Hurricanes	Produced by Model
Current Submission		
Previously Accepted Submission		
Percentage Change Current Submission/Previously Accepted Submission		
Second Previously Accepted Submission		
Percentage Change Current Submission/Second Previously Accepted Submission		

- B. Provide a comparison with the statewide personal and commercial residential loss costs produced by the model on an average industry basis.
- C. Provide the 95% confidence interval on the differences between the mean of the historical and modeled personal and commercial residential loss.
- D. If the data are partitioned or modified, provide the average annual zero deductible statewide personal and commercial residential loss costs for the applicable partition (and its complement) or modification, as well as the modeled average annual zero deductible statewide personal and commercial residential loss costs in additional copies of Form S-5 (Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled).

Part B

- A. Provide the average annual zero deductible statewide personal and commercial residential loss costs produced using the list of hurricanes in the Base Hurricane Storm Set as defined in Standard M-1 (Base Hurricane Storm Set) based on the 2012 Florida Hurricane Catastrophe Fund’s aggregate personal and commercial residential exposure data found in the file named “*hlpm2012c.exe*.”

Average Annual Zero Deductible Statewide Personal and Commercial Residential Loss Costs

Time Period – 2012 FHCF Exposure Data	Historical Hurricanes	Produced by Model
Current Submission		

- B. Provide a comparison with the statewide personal and commercial residential loss costs produced by the model on an average industry basis.
- C. Provide the 95% confidence interval on the differences between the mean of the historical and modeled personal and commercial residential loss.
- D. If the data are partitioned or modified, provide the average annual zero deductible statewide personal and commercial residential loss costs for the applicable partition (and its complement) or modification, as well as the modeled average annual zero deductible statewide personal and commercial residential loss costs in additional copies of Form S-5 (Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled).

Form S-6: Hypothetical Events for Sensitivity and Uncertainty Analysis

Specifications

The Excel file “*FormS6Input13.xlsx*” contains nine worksheets which are to be used by the modeling organization in performing sensitivity and uncertainty analyses for their model. The first eight worksheets are classified, as follows:

Sensitivity Analysis	Uncertainty Analysis
1. Sen Anal all Variables	2. Unc Anal for CP 3. Unc Anal for Rmax 4. Unc Anal for VT 5. Unc Anal for Shape Parameter 6. Unc Anal for CF 7. Unc Anal for FFP 8. Unc Anal for Quantile

The first worksheet (“Sen Anal all Variables”) contains three sets of 100 random combinations of the following seven model input variables for each of three categories of hurricanes (1, 3, and 5):

- CP = central pressure (in millibars)
- Rmax = radius of maximum winds (in statute miles)
- VT = translational velocity (forward speed in miles per hour)
- Model shape parameter such as the Holland B parameter
- CF = conversion factor for converting the modeled gradient winds to surface winds
- FFP = far field pressure (in millibars)
- Quantiles for possible additional input variable (use is optional)

These model input variables are based on the probability distributions given in *Figure 4*.

These model input variables may or may not exactly match those used by the modeling organization. A second input file “*FormS6Input13Quantiles.xlsx*” has been provided that contains the corresponding quantiles for the seven model input variables above, hence there is a one-to-one correspondence between these two files. Modeling organizations may use the quantiles in “*FormS6Input13Quantiles.xlsx*” in lieu of the specific values in “*FormS6Input13.xlsx*.” Note that the values of CP and Rmax, and the corresponding quantiles, have been produced with a rank correlation of 0.3 in the case of the Category 5 hurricane. No other variables or quantiles are correlated. The modeling organization shall disclose how quantiles were used. If any model input variables are modified, provide the modified input files corresponding to those in the worksheet “Sen Anal all Variables.”

The values of CP and FFP in the Excel file can either be used as the basis for calculating pressure difference, which would then be used as a single model input, or both CP and FFP can be used as model inputs. Disclose whether CP and FFP were used as the basis for calculating pressure difference or as direct model inputs.

Rmax, VT, and CF (as appropriate to the model) are to be used as direct model inputs where applicable. An example of CF implementation is presented below.

Figure 4 Probability Distributions for Model Input Variables

	Category	Distribution	Parameters
CP	Cat 1	Triangular	a=975, b=982.5, c=990
	Cat 3	Triangular	a=945, b=952.5, c=960
	Cat 5	Triangular	a=900, b=910, c=920
Rmax	Cat 1	Triangular	a=12, b=22, c=40
	Cat 3	Triangular	a=8, b=20, c=40
	Cat 5	Triangular	a=5, b=12, c=25
VT	Cat 1	Triangular	a=10, b=15, c=20
	Cat 3	Triangular	a=10, b=15, c=20
	Cat 5	Triangular	a=10, b=15, c=20
Hol B	Cat 1	Quantile provided	
	Cat 3	Quantile provided	
	Cat 5	Quantile provided	
CF	Cat 1	Uniform	(0.8, 0.95)
	Cat 3	Uniform	(0.8, 0.95)
	Cat 5	Uniform	(0.8, 0.95)
FFP	Cat 1	Uniform	(1006, 1020)
	Cat 3	Uniform	(1006, 1020)
	Cat 5	Uniform	(1006, 1020)
No. 7	Cat 1	Quantile provided	
	Cat 3	Quantile provided	
	Cat 5	Quantile provided	

The fourth model input variable in the above list specifies quantiles ($0 \leq p \leq 1$) to be used with the modeling organization's distribution for the shape of the wind profile parameter, for example the Holland B profile parameter (or suitable alternative). Quantiles from 0 to 1 have been provided in the Excel input file "*FormS6Input13Quantiles.xlsx*" rather than specific values since modeling organizations may use different ranges and distributions for the Holland B profile parameter.

As an illustration, if the quantile has been specified as 0.345 in the Excel input file, input the specific value of x into the model such that $P(X \leq x) = 0.345$ where X is a random variable representing the modeling organization's distribution for the Holland B profile parameter or other shape parameter used by the modeling organization.

If the last quantile input variable is used, describe how it was used and provide the specific values that correspond to the quantiles in Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis). That is, this quantile variable would be treated in the same manner as the

Holland B profile parameter. Note that the fourth and seventh input variables appear as quantiles in both “*FormS6Input13.xlsx*” and “*FormS6Input13 Quantiles.xlsx*.”

The CF variable is used to implement uncertainty in the conversion of modeled gradient winds to surface winds CF as a function of the radius (r) from the center of the hurricane to a given point in the hurricane windfield. The following example is provided to illustrate how CF could be implemented based on the following three intervals:

CASE 1: $r < R_{max}$

The value of the random variable CF from the Excel input file “*FormS6Input13.xlsx*” is multiplied by r/R_{max} in this interval. This ratio varies from 0 at the center of the eye to 1 at $r = R_{max}$ so CF increases linearly from the center of the eye to its maximum at R_{max} . As an example, suppose the value of CF in a particular input vector in the Excel file is 0.84, then the value of CF is zero at the center of the hurricane and $0.84(1) = 0.84$ at R_{max} . In between these two positions, the value of CF is based on linear interpolation using multiplication by r/R_{max} .

CASE 2: $R_{max} < r < 3 \cdot R_{max}$

Within this interval, the value of the random variable CF is decreased from its maximum at $r = R_{max}$ by the following amount:

$$[(r - R_{max}) / (3 \cdot R_{max} - R_{max})] \cdot (0.1)$$

Thus, at $r = R_{max}$, CF is not decreased. At $r = 3 \cdot R_{max}$, CF is decreased by 0.1. This calculation is simple linear interpolation between R_{max} and $3 \cdot R_{max}$.

CASE 3: $r > 3 \cdot R_{max}$

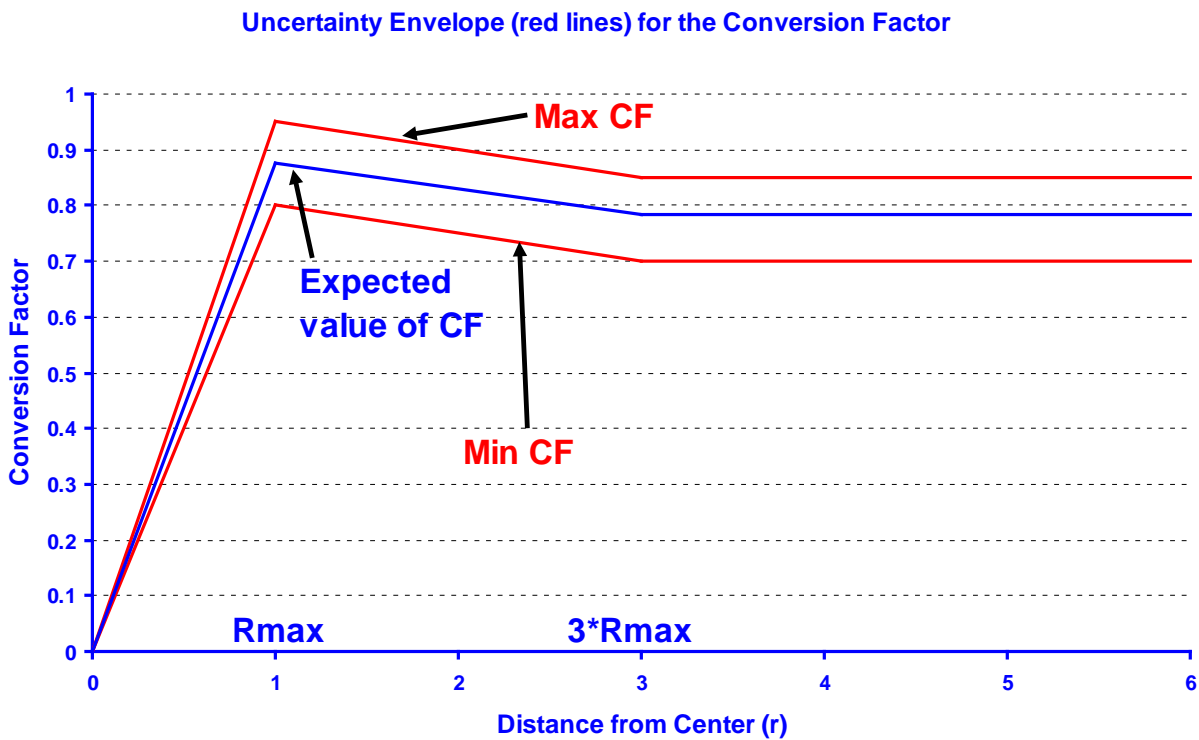
The value of the random variable CF at $3 \cdot R_{max}$ is used for the remainder of the outer region, i.e. beyond $r = 3 \cdot R_{max}$.

In summary, CF ramps up from its minimum value of 0 at the center of the hurricane to its maximum at R_{max} and then ramps down in a linear fashion to $3 \cdot R_{max}$, where it achieves its maximum decrease of 0.1 from its value at R_{max} . CF then remains at this value beyond $3 \cdot R_{max}$. As an example, the previous value of $CF = 0.84$ would occur at R_{max} and then decrease in a linear fashion to $0.84 - 0.1 = 0.74$ at $3 \cdot R_{max}$ and remain at this value beyond $3 \cdot R_{max}$.

Figure 5 shows an “Uncertainty Envelope” for CF using the methodology in this example. The horizontal axis in this graph is in units of R_{max} . Thus, $r = 0 \cdot R_{max}$ represents the center of the hurricane, $r = 1 \cdot R_{max}$ represents R_{max} and $r = 3 \cdot R_{max}$ represents the start of the outer region. Two red lines have been added in *Figure 5* to show the minimum and maximum possible values of CF from the input vectors in the Excel file “*FormS6Input13.xlsx*” over the region of the hurricane. The blue line represents the expected value of CF when the distribution is uniform between 0.80 and 0.95. Thus, the minimum value of CF at $r = R_{max}$ is 0.8 and the maximum is 0.95. At $r = 3 \cdot R_{max}$, these minimum and maximum values are decreased by 0.1 to 0.7 and 0.85,

respectively. This description of CF is meant to be illustrative and serve as a guide for the modeling organization to adapt CF to their model.

Figure 5



Uncertainty Envelope for the Conversion Factor

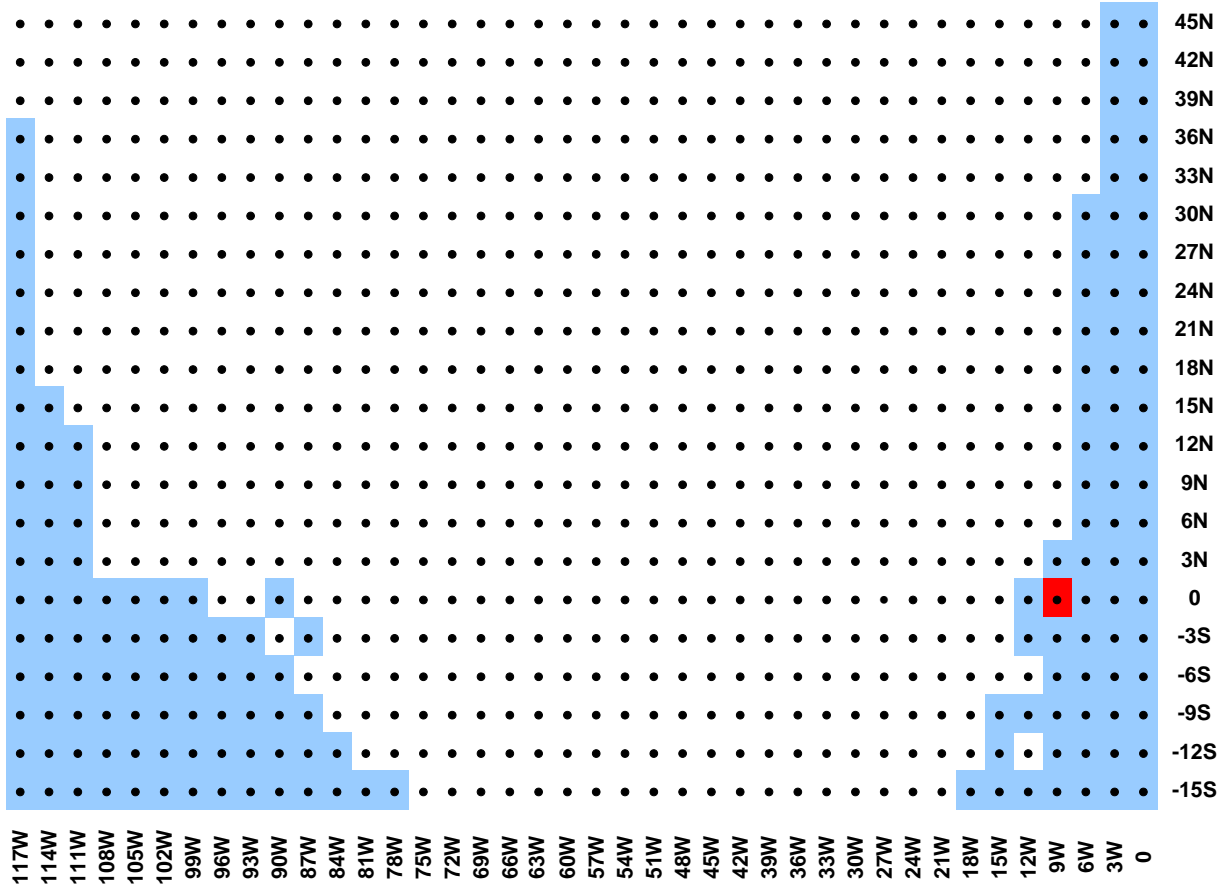
The 100 combinations of these seven model input variables represent different initial conditions for each of three categories of hurricanes (1, 3, and 5) given in the Excel input file. These hurricanes follow a straight due west track passing through the point (24.8611N, 80.1196W).

The 21×40 grid illustrated in *Figure 6* for southern Florida uses an approximate 3 statute mile spacing. For purposes of hurricane decay, use existing terrain consistent with the grid in *Figure 6* or *Figure 7* (map version with grid identified as a rectangular region).

The point (0, 0) is the location of the center of the hurricane at time 0, and is 9 miles east of the landfall location (25.8611N, 80.1196W), identified by the red rectangle in *Figure 6*. The hurricane is to be modeled for 12 hours starting at time 0. The approximate latitudes and longitudes for the 840 vertices in the 21x40 grid are given in the ninth worksheet of the Excel input file.

Figure 6

Grid for Calculating Hourly Wind Velocities

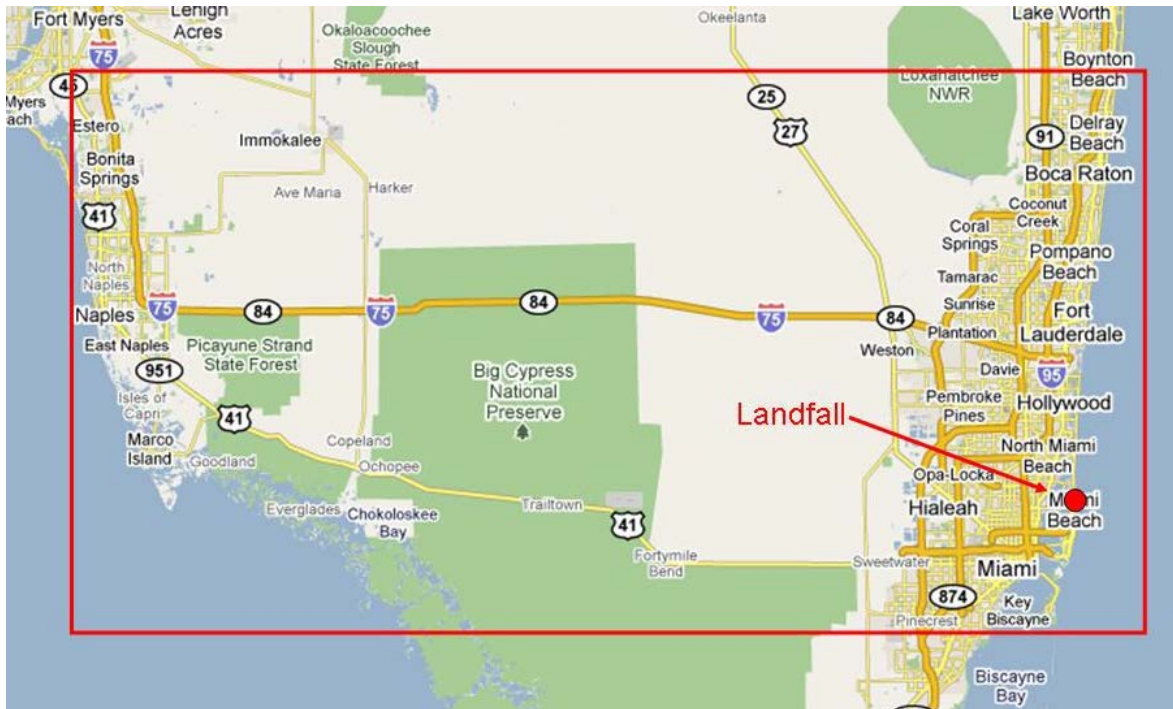


Hurricane Path from (0, 0) to (117W, 0)



Figure 7

Map Version of Grid for Calculating Hourly Wind Velocities



Loss Cost

Successful completion of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) demonstrates that the modeling organization is capable of running an insurance portfolio at a latitude/longitude level directly and at a street address level indirectly with appropriate conversion to latitude/longitude.

Loss costs are to be determined using a \$100,000 insured structure with a zero deductible policy, not to include contents, time element, or appurtenant structures coverages, at each of the 682 land-based vertices in *Figure 6*. The Excel input file contains a ninth worksheet (Land-Water ID) that lists the 840 grid coordinates with an indicator variable defined, as follows:

- 0 = coordinate is over-water
- 1 = coordinate is over-land

The following house is assumed at each of the land-based grid points designated by the indicator variable.

- Single family
- Single story
- Masonry walls
- Truss anchors
- Gable end roof
- No shutters
- Shingles with one layer 15# felt
- 1/2" plywood roof deck with 8d nails at 6" edge and 12" field
- House constructed in 1980

Produce loss costs for each hurricane category in two forms:

1. Aggregated loss costs over the 682 land-based vertices in the grid in *Figure 6* for each input vector and each hurricane category ($100 \times 3 = 300$ values).
2. The mean loss cost at each of the 682 land-based vertices in the grid in *Figure 6* over all 100 input vectors for each hurricane category ($682 \times 3 = 2,046$ means).

1. Calculate the total loss cost over the 682 land-based vertices in the grid for each of the 100 input vectors and then divide this sum by \$68,200,000 to get the expected loss cost as a percent of total exposure. The results for each input vector should be reported on a single row with the following information:

- Hurricane category (1, 3, or 5)
- Input vector number
- Total loss cost over the 682 land-based vertices in the grid
- The expected loss cost as a percent of total exposure to two decimal places (i.e., 15.42 for 15.42%)

Thus, the entries in this file for input vectors 35-37 for the Category 5 hurricane will appear as in the following format:

```

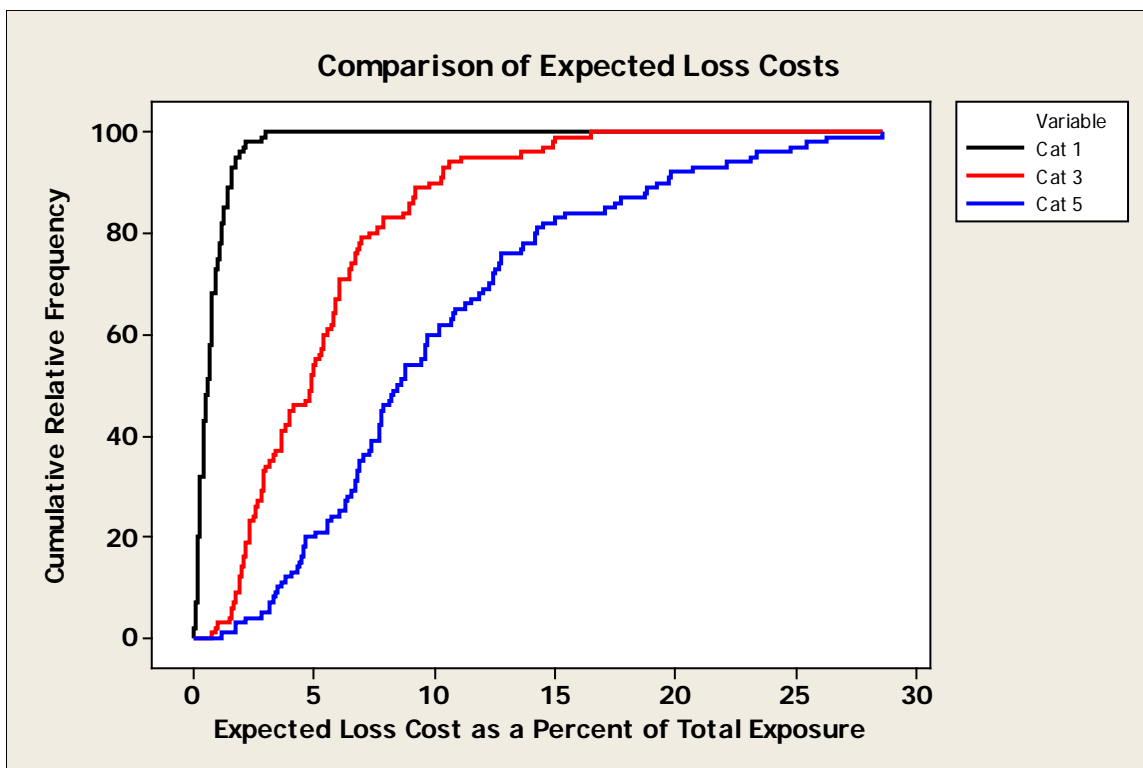
5 35 4767326. 6.99
5 36 4365003. 6.40
5 37 2531948. 3.71

```

Provide the results in an ASCII file and a PDF file named “XXX13Expected Loss Cost” where XXX denotes the abbreviated name of the modeling organization. The ASCII file will have 300 rows.

Display these results as cumulative empirical distribution functions as shown in *Figure 8* or its equivalent.

Figure 8



2. Report the mean loss cost at each of the 682 land-based vertices in the grid over all 100 input vectors for each hurricane category. The results should be reported with the following information:

- Hurricane category (1, 3, or 5)
- E-W grid coordinate (0, 3, 9, 12, ..., 120)
- N-S grid coordinate (-15, -12, -9, -6, ..., 45)
- Loss cost as a percent of the exposure (\$100,000) at each land-based coordinate to four decimal places (i.e., 0.1207 for 12.07%)

Thus, the entries in this file for the land-based vertices (12,18), (15,18), and (18,18) for the Category 5 hurricane will appear as in the following format:

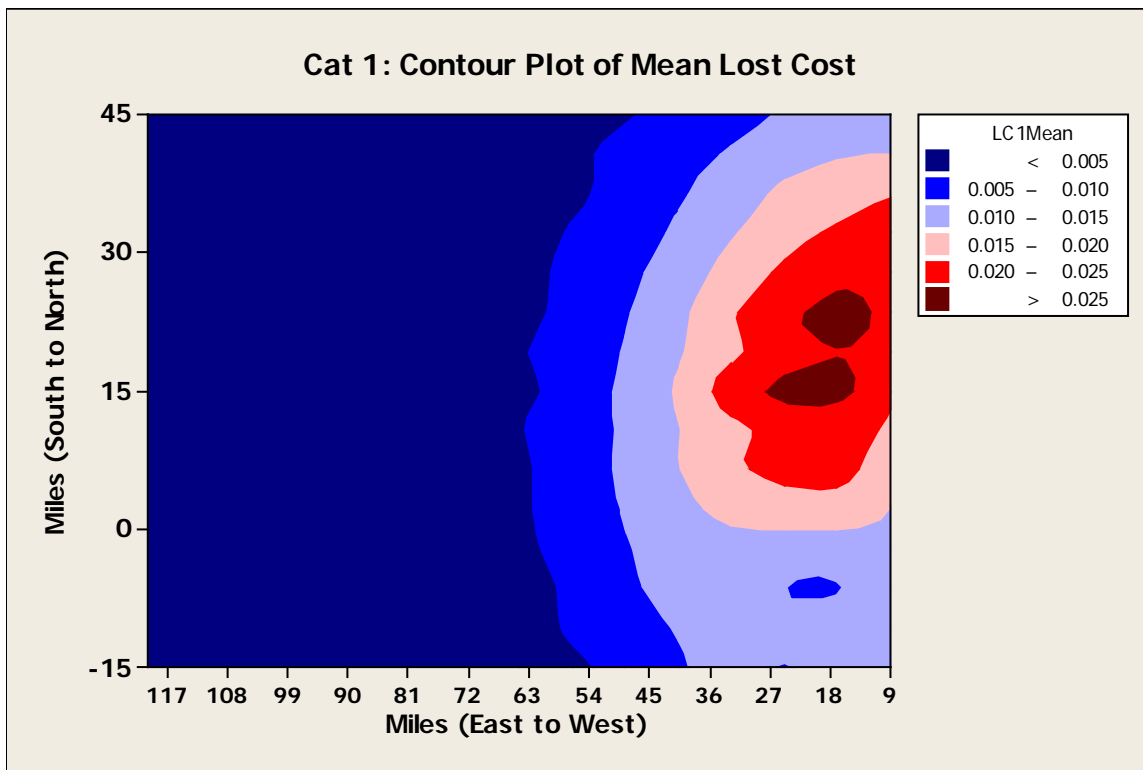
```
5 12 18 0.5142
5 15 18 0.4533
5 18 18 0.3872
```

Provide the results in an ASCII file and a PDF file named “XXX13Loss Cost Contour” where XXX denotes the abbreviated name of the modeling organization. The ASCII file will have 3 x 682 = 2,046 rows.

Display the mean of the 100 input vectors as contour plots for each hurricane category as shown in *Figures 9 to 11* (use the suggested contour levels in these figures).

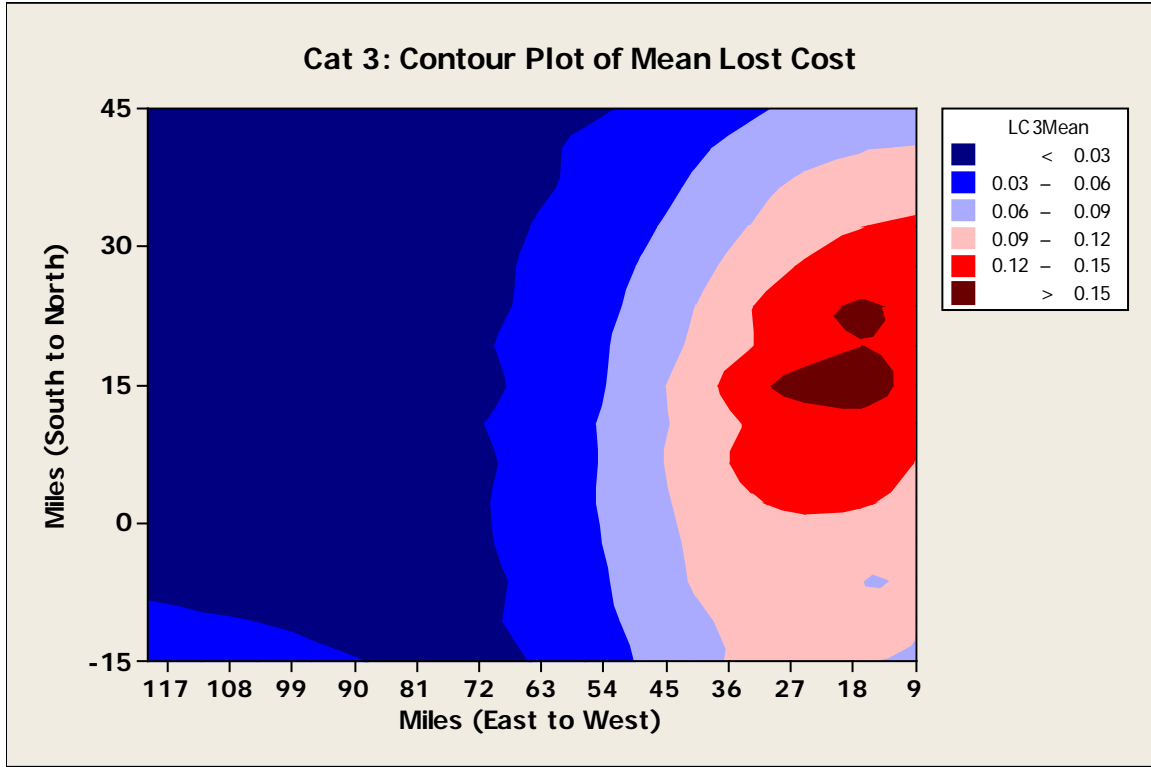
Note for contour plotting. The grid coordinates are written from east to west, but most contour plot software will have the origin in the lower left-hand corner (i.e., west to east). Thus, the X coordinates 18, 15, and 12 in the above example will need to be plotted as 120-18=12, 120-15=15, and 120-12=108 to avoid having a mirror image plot. Labels on the east-west axis will then have to be added to reflect the east to west grid as in *Figures 9 to 11*.

Figure 9



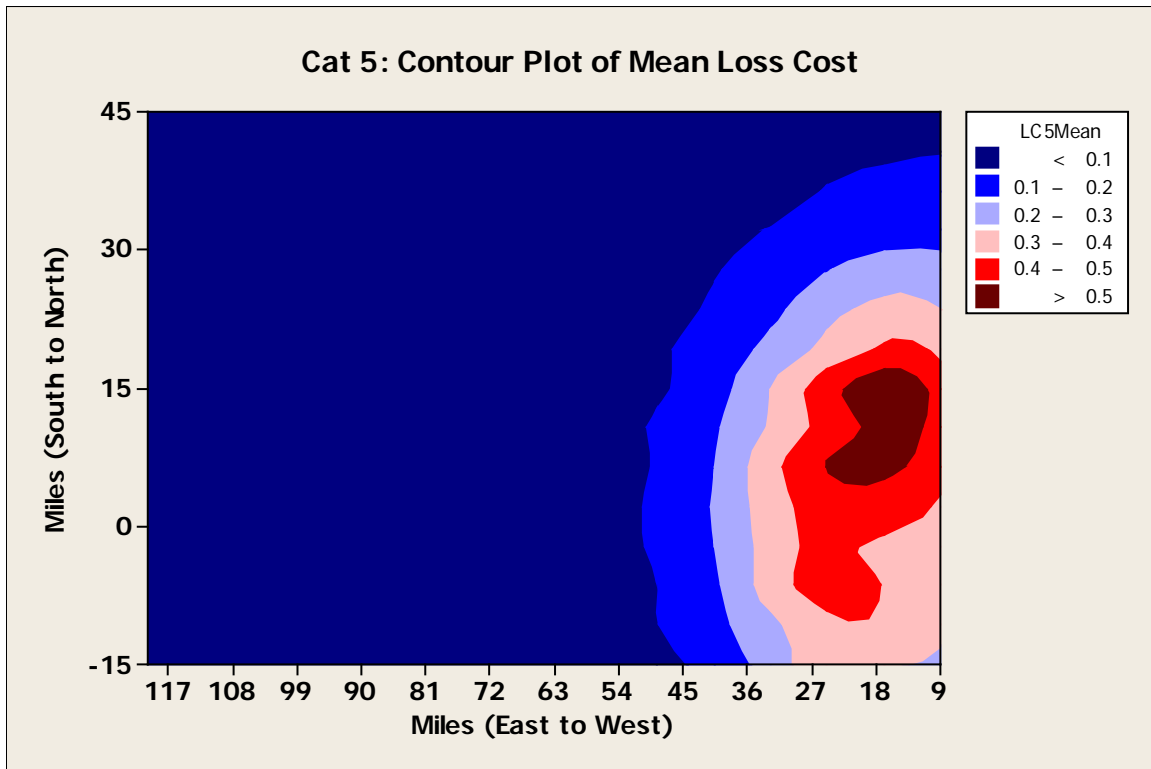
Contour Plot of Loss Cost for a Category 1 Hurricane

Figure 10



Contour Plot of Loss Cost for a Category 3 Hurricane

Figure 11



Contour Plot of Loss Cost for a Category 5 Hurricane

Uncertainty and Sensitivity Analysis for Loss Cost

The modeling organization shall perform uncertainty and sensitivity analyses for expected loss cost as outlined below. The Professional Team will perform uncertainty and sensitivity analyses based on the modeling organization’s expected loss cost calculations as part of its preparation prior to reviewing the modeling organization’s internal uncertainty and sensitivity analyses (using the model’s actual damage functions) during the on-site reviews. The modeling organization shall present to the Professional Team their uncertainty and sensitivity analyses of their model using the model’s vulnerability functions.

Sensitivity analyses will be based on standardized regression coefficients (SRC) for each model input variable in the Excel input file. The calculation of the SRCs is explained on page 22 of the *Professional Team Demonstration Uncertainty/Sensitivity Analysis* by R.L. Iman, M.E. Johnson, and T.A. Schroeder, September 2001, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/UA-SA%20Demo.pdf.

Loss costs used in these sensitivity analyses were based on the Professional Team’s surrogate damage function. If the SRC is positive for a given model input variable, then loss cost increases as the variable increases while negative SRC values indicate that loss cost decreases as the variable increases. The SRCs in these sensitivity analyses are summarized, as follows:

<u>Category</u>	<u>CP</u>	<u>Rmax</u>	<u>VT</u>	<u>Holland B</u>	<u>CF</u>	<u>FFP</u>
1	-0.3924	0.4350	0.0692	0.5995	0.3633	0.0944
3	-0.2342	0.6996	-0.0488	0.3755	0.4265	0.1181
5	-0.1328	0.9397	-0.0373	0.1129	0.3372	0.0599

Figure 12 presents graphs of these SRCs for all six input variables for each category of hurricane. This figure shows that the Holland B profile parameter has the most influence on the magnitude of loss cost for a Category 1 hurricane and this relationship is positive. Rmax has the second most influence on the magnitude of loss cost (positive) followed closely by CP (negative relationship) and CF (positive). FFP and VT had slight influence.

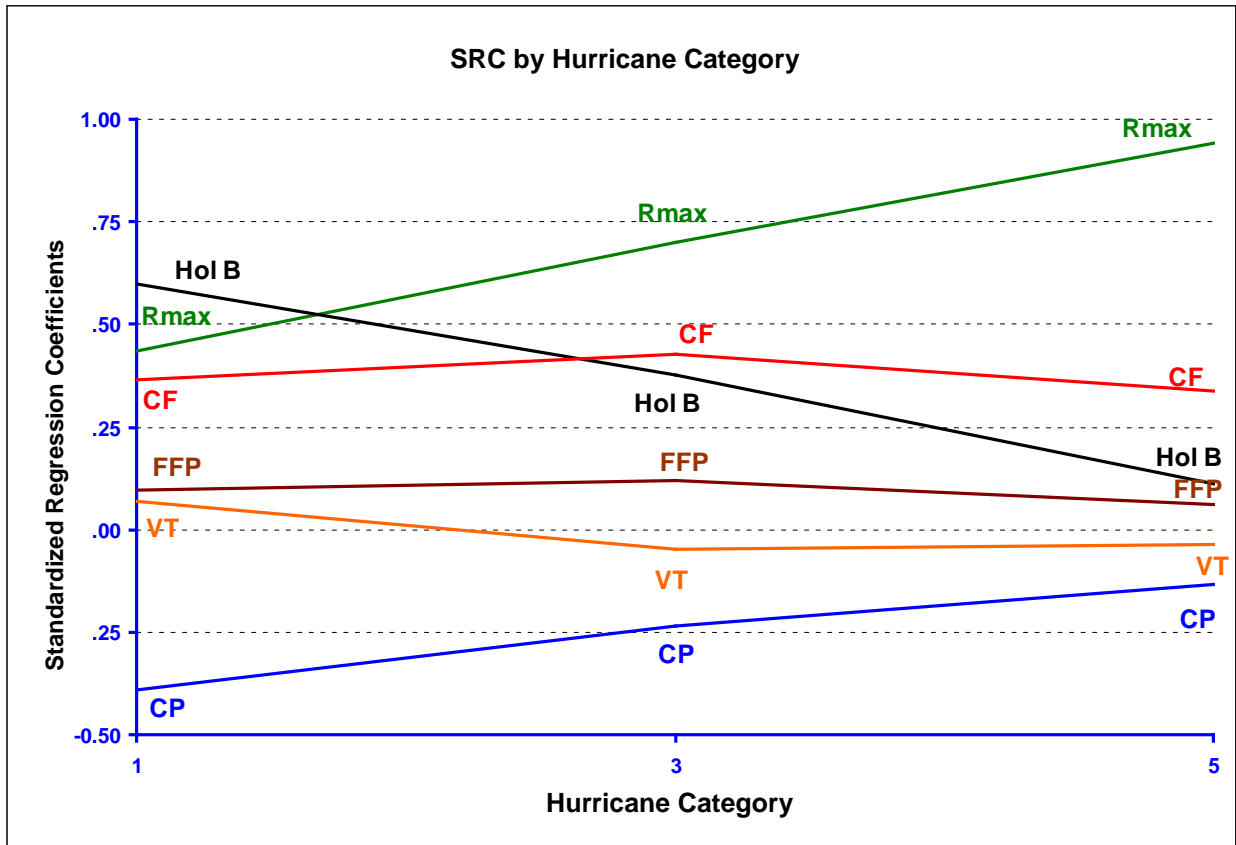
The Category 3 results in *Figure 12* show that Rmax now has the most influence on the magnitude of loss costs followed by CF and then Holland B and CP. FFP and VT again had the least influence.

The SRCs for Category 5 in *Figure 12* have the same ordering as for a Category 3 with the exception that Holland B and CP interchanged in the middle two positions.

Over all hurricane categories, Rmax, CF, and Holland B have the most influence on the magnitude of loss cost followed in fourth place by CP and then FFP and VT.

Note: Individual modeling organization results may differ significantly from the demonstration results shown here.

Figure 12



SRCs for Expected Loss Cost for all Input Variables for all Hurricane Categories

Uncertainty analyses will be based on expected percentage reduction (EPR) for each model input variable in the Excel input file. The calculation of the EPRs is explained on page 22 of the *Professional Team Demonstration Uncertainty/Sensitivity Analysis* by R. L. Iman, M. E. Johnson, and T. A. Schroeder, September 2001, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/UA-SA%20Demo.pdf.

If the EPR is large for a given input variable, that variable makes a large contribution to the uncertainty in loss cost while a small EPR indicates that the variable contributes much less to the uncertainty in loss cost. The EPRs in these uncertainty analyses are summarized, as follows:

Category	CP	Rmax	VT	Holland B	CF	FFP
1	14.2%	16.9%	0.6%	37.6%	15.0%	1.4%
3	5.3%	43.7%	0.1%	12.1%	15.7%	0.8%
5	2.8%	88.7%	0.0%	1.7%	12.8%	0.7%

Figure 13 presents graphs of these EPRs for all six input variables for each category of hurricane. This figure shows that the Holland B profile parameter makes the largest contribution to the uncertainty (37.6%) in loss cost for a Category 1 hurricane. Rmax makes the next largest contribution (16.9%) followed closely by CF (15.0%) and then CP (14.2%). FFP (1.4%) and VT (0.6%) made very little contribution to the uncertainty in loss cost.

The Category 3 results in *Figure 13* show that Rmax makes the largest contribution to the uncertainty (43.7%) in loss cost followed by CF (15.7%) and Holland B (12.1%) while CP drops (5.3%). FFP (0.8%) and VT (0.1%) again make very little contribution to the uncertainty in loss cost.

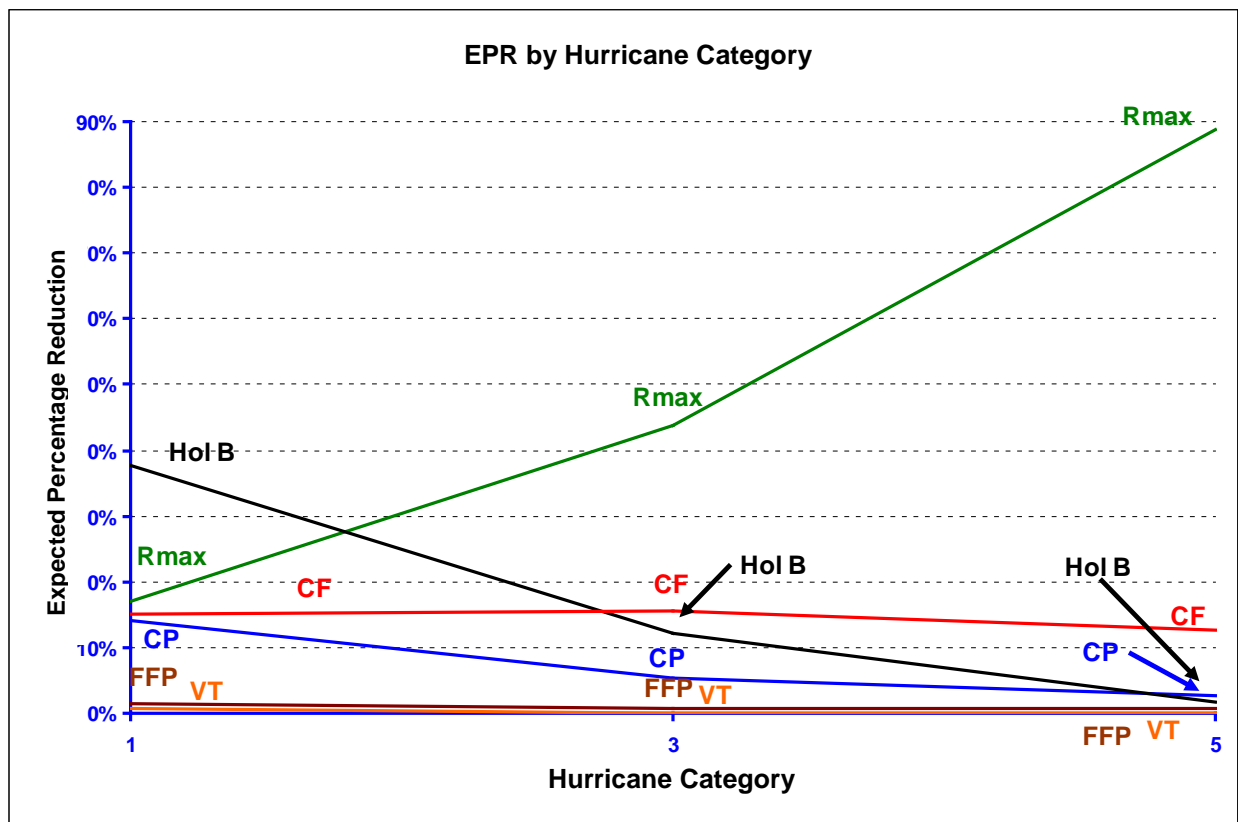
The EPRs for Category 5 in *Figure 13* have the same ordering as for a Category 3 with the exception that Holland B and CP are interchanged in the middle two positions. It is important to note that Holland B dominates the uncertainty in loss cost for smaller hurricanes and then decreases in influence for larger hurricanes while just the opposite is true for Rmax. CF is in second place for Category 3 and 5 and in third place for Category 1.

Over all hurricane categories, Rmax, CF, and Holland B make the largest contributions to the uncertainty in loss cost followed in fourth place by CP and then FFP and VT.

The EPRs in the above summary do not necessarily sum to 100% unless the underlying model is linear. In this case, the sums for Category 1, 3, and 5 are 86%, 78%, and 107%.

Note: Individual modeling organization results may differ significantly from the demonstration results shown here.

Figure 13



EPRs for Expected Loss Cost for all Input Variables for all Hurricane Categories

Clarification of Input and Output Files for Form S-6, Hypothetical Events for Sensitivity and Uncertainty Analysis

The Professional Team will need all actual input and output files to check the modeling organization's sensitivity and uncertainty analyses results for loss cost as specified in Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis). The following explanation is provided to clarify which files the modeling organization needs to submit. Compliance in submitting these files will eliminate the need for the Professional Team to request these files during the on-site review and to allow checking the results prior to the on-site review.

Sensitivity Analysis. The first worksheet in the Excel file "*FormS6Input13.xlsx*" is entitled "Sen Anal all Variables." This worksheet contains Latin hypercube samples (LHS) consisting of 100 random combinations of the following seven model input variables for each of three categories of hurricanes (1, 3, and 5):

- CP = central pressure (in millibars)
- Rmax = radius of maximum winds (in statute miles)
- VT = translational velocity (forward speed in miles per hour)
- Model shape parameter such as the Holland B parameter
- CF = conversion factor for converting the modeled gradient winds to surface winds (or an optional additional input variable if conversion factor is not used)
- FFP = far field pressure (in millibars)
- Quantiles for possible additional input variable (use is optional)

Modeling organizations might choose to use some variation of these input variables. For example, the modeling organization might choose not to use the "model shape parameter," but choose to include the "quantile" variable. The actual LHS files used by the modeling organization should be submitted including the identification of the input parameters that were used. The modeling organization should also submit the loss cost output files for the sensitivity analysis portion of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis).

Uncertainty Analysis. Worksheets 2-8 in the Excel file "*FormS6Input13.xlsx*" are used for the uncertainty analysis portion of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) and are labeled, as follows:

2. Unc Analysis for CP
3. Unc Analysis for Rmax
4. Unc Analysis for VT
5. Unc Analysis for Shape Parameter
6. Unc Analysis for CF
7. Unc Analysis for FFP
8. Unc Analysis for Quantile

The modeling organization should submit the loss cost output files for the uncertainty analysis portion of Form S-6 (Hypothetical Events for Sensitivity and Uncertainty Analysis) corresponding to worksheets 2-8.

VULNERABILITY STANDARDS

V-1 Derivation of Building Vulnerability Functions*

(*Significant Revision)

- A. Development of the building vulnerability functions shall be based on at least one of the following: (1) historical data, (2) tests, (3) rational structural analysis, and (4) site inspections. Any development of the building vulnerability functions based on rational structural analysis, site inspections, and tests shall be supported by historical data.**
- B. The method of derivation of the building vulnerability functions and their associated uncertainties shall be theoretically sound and consistent with fundamental engineering principles.**
- C. Residential building stock classification shall be representative of Florida construction for personal and commercial residential properties.**
- D. Building height/number of stories, primary construction material, year of construction, location, building code, and other construction characteristics, as applicable, shall be used in the derivation and application of building vulnerability functions.**
- E. Vulnerability functions shall be separately derived for commercial residential building structures, personal residential building structures, mobile homes, and appurtenant structures.**
- F. The minimum windspeed that generates damage shall be consistent with fundamental engineering principles.**
- G. Building vulnerability functions shall include damage as attributable to windspeed and wind pressure, water infiltration, and missile impact associated with hurricanes. Building vulnerability functions shall not include explicit damage to the building due to flood, storm surge, or wave action.**

Purpose: The development of building vulnerability functions shall not be based exclusively on rational structural analysis or site inspections. Use of rational structural analysis or site inspections shall be supported by tests and historical data, and their use shall be appropriate.

The development of building vulnerability functions shall be documented with respect to the sources, including data and calculations derived from site inspections and engineering judgment.

Building codes and their enforcement affect the building vulnerability functions.

Separate vulnerability functions are required for commercial residential building structures, personal residential building structures, mobile homes, and appurtenant structures.

Damage certainly occurs above the hurricane threshold of 74 mph, but can also occur for windspeeds well below this threshold.

Insurance company data used in building vulnerability function development may include appropriate insurer or modeling organization adjustments that do not diminish the usefulness of the data.

Relevant Forms: G-4, Vulnerability Standards Expert Certification
V-1, One Hypothetical Event
A-6, Logical Relationship to Risk (Trade Secret item)

Disclosures

1. Describe any modifications to the building vulnerability component in the model since the previously accepted model.
2. Provide a flow chart documenting the process by which the building vulnerability functions are derived and implemented.
3. Describe the nature and extent of actual insurance claims data used to develop the model's building vulnerability functions. Describe in detail what is included, such as, number of policies, number of insurers, date of loss, and number of units of dollar exposure, separated into personal residential, commercial residential, and mobile home.
4. Describe the data, methods, and processes used for the development of the building vulnerability functions.
5. Summarize site inspections, including the source, and provide a brief description of the resulting use of these data in development, validation, or verification of building vulnerability functions.
6. Describe the research used in the development of the model's building vulnerability functions.
7. Describe the categories of the different building vulnerability functions. Specifically, include descriptions of the building types and characteristics, building height, number of stories, regions within the state of Florida, year of construction, and occupancy types in which a unique building vulnerability function is used. Provide the total number of building vulnerability functions available for use in the model for personal and commercial residential classifications.
8. Describe the process by which local construction practices and building code adoption and enforcement are considered in the model.

9. Describe the development of the vulnerability functions for appurtenant structures.
10. Describe the relationship between building structure and appurtenant structure vulnerability functions.
11. Describe the assumptions, data, methods, and processes used to develop building vulnerability functions for unknown residential construction types.
12. Describe the assumptions, data, methods, and processes used to develop building vulnerability functions when some primary characteristics are unknown.
13. Describe the assumptions, data, methods, and processes used to develop building vulnerability functions for various construction types for renters and condo-unit owners.
14. Describe any assumptions, data, methods, and processes used to develop and validate building vulnerability functions concerning insurance company claims.
15. Demonstrate that building vulnerability function relationships (building structures and appurtenant structures) are consistent with insurance claims data.
16. Identify the one-minute average sustained windspeed and the windspeed reference height at which the model begins to estimate damage.
17. Describe how the duration of windspeeds at a particular location over the life of a hurricane is considered.
18. Describe how the model addresses wind borne missile impact damage and water infiltration.
19. Provide a completed Form V-1, One Hypothetical Event. Provide a link to the location of the form here.

Audit

1. Modifications to the building vulnerability component in the model since the previously accepted model will be reviewed in detail, including the rationale for the modifications, the scope of the modifications, the process, the resulting modifications and their impacts on the building vulnerability component. Comparisons with the previously accepted model will be reviewed.
2. Historical data shall be available in the original form with explanations for any changes made and descriptions of how missing or incorrect data were handled. For historical data used to develop building vulnerability functions, demonstrate the goodness-of-fit of the data. Complete reports detailing loading conditions and damage suffered are required for any test data used. Complete rational structural analyses shall be presented so that a variety of different building types and construction characteristics may be selected for review. Tests and original site inspection reports shall be available for review.

3. Copies of any papers, reports, and studies used in the development of the building vulnerability functions shall be available for review. Copies of all public record documents used may be requested for review.
4. Multiple samples of building vulnerability functions for commercial residential building structures, personal residential building structures, mobile homes, and appurtenant structures shall be available. The magnitude of logical changes among these items for a given windspeed shall be explained and validation materials shall be available.
5. Justify the construction types and characteristics used.
6. Provide validation of the mean building vulnerability functions and associated uncertainties.
7. Document and justify all modifications to the building vulnerability functions due to building codes and their enforcement. If age of building is used as a surrogate for building code and code enforcement, provide complete supporting information for the number of age groups used as well as the year(s) of construction that separates particular group(s).
8. Provide validation material for the disclosed minimum windspeed. Provide the computer code showing the inclusion of the minimum windspeed at which damage occurs.
9. The effects on building vulnerability from local and regional construction characteristics and building codes will be reviewed.
10. Describe how the claim practices of insurance companies are accounted for when claims data for those insurance companies are used to develop or to verify building vulnerability functions. Examples include the level of damage the insurer considers a loss to be a total loss, claim practices of insurers with respect to concurrent causation, or the impact of public adjusting.
11. Provide the percentage of damage at or above which the model assumes a total loss.
12. Form V-1 (One Hypothetical Event) will be reviewed.

V-2 Derivation of Contents and Time Element Vulnerability Functions*

*(*Significant Revision)*

- A. Development of the contents and time element vulnerability functions shall be based on at least one of the following: (1) historical data, (2) tests, (3) rational structural analysis, and (4) site inspections. Any development of the contents and time element vulnerability functions based on rational structural analysis, site inspections, and tests shall be supported by historical data.***
- B. The relationship between the modeled building and contents vulnerability functions and historical building and contents losses shall be reasonable.***
- C. Time element vulnerability function derivations shall consider the estimated time required to repair or replace the property.***
- D. The relationship between the modeled building and time element vulnerability functions and historical building and time element losses shall be reasonable.***
- E. Time element vulnerability functions used by the model shall include time element coverage claims associated with wind, flood, and storm surge damage to the infrastructure caused by a hurricane.***

Purpose: A reasonable representation of contents and time element losses is necessary in order to address policies that cover contents and time element losses.

Policies can provide varying types of time element coverage and insurance policies may pay for time element claims irrespective of damage to the insured property.

Relevant Form: G-4, Vulnerability Standards Expert Certification

Disclosures

1. Describe any modifications to the contents and time element vulnerability component in the model since the previously accepted model.
2. Provide a flow chart documenting the process by which the contents vulnerability functions are derived and implemented.
3. Describe the data and methods used to develop vulnerability functions for contents coverage associated with personal and commercial residential buildings.

4. Describe the number of contents vulnerability functions and whether different contents vulnerability relationships are used for personal residential, commercial residential, mobile home, condo unit owners, apartment renter unit location, and other similar building classes for wind related damage.
5. Provide a flow chart documenting the process by which the time element vulnerability functions are derived and implemented.
6. Describe the data and methods used to develop vulnerability functions for time element coverage associated with personal and commercial residential buildings. State whether the model considers both direct and indirect loss to the insured property. For example, direct loss could be for expenses paid to house policyholders in an apartment while their home is being repaired. Indirect loss could be for expenses incurred for loss of power (e.g., food spoilage).
7. State the minimum threshold at which time element loss is calculated (e.g., loss is estimated for building damage greater than 20% or only for category 3, 4, 5 events). Provide documentation of validation test results to verify the approach used.
8. Describe how modeled time element loss costs take into consideration the damage (including damage due to storm surge, flood, and wind) to local and regional infrastructure.
9. Describe the relationship between building structure and contents vulnerability functions.
10. Describe the relationship between building structure and time element vulnerability functions.
11. Describe the assumptions, data, methods, and processes used to develop contents and time element vulnerability functions for unknown residential construction types.
12. Describe the assumptions, data, methods, and processes used to develop contents and time element vulnerability functions when some of the primary characteristics are unknown.
13. Describe any assumptions, data, methods, and processes used to develop and validate contents and time element vulnerability functions concerning insurance company claims.
14. Demonstrate that contents and time element vulnerability function relationships are consistent with insurance claims data.

Audit

1. Modifications to the contents and time element vulnerability component in the model since the previously accepted model will be reviewed in detail, including the rationale for the modifications, the scope of the modifications, the process, the resulting modifications and their impact on the contents and time element vulnerability component. Comparisons with the previously accepted model will be reviewed.
2. To the extent that historical data are used to develop mathematical depictions of contents vulnerability functions, demonstrate the goodness-of-fit of the data to fitted models.
3. Justify changes from the previously accepted submission in the relativities between vulnerability functions for building and the corresponding vulnerability functions for contents.
4. Documentation and justification of the following will be reviewed:
 - a. The method of derivation and data on which the time element vulnerability functions are based;
 - b. Validation data specifically applicable to time element coverages;
 - c. Assumptions regarding the coding of time element losses by insurers;
 - d. The effects of demand surge on time element for the 2004 and 2005 hurricane seasons;
 - e. Assumptions regarding the variability of time element losses by size of property;
 - f. Statewide application of time element coverage assumptions;
 - g. Assumptions regarding time element coverage for mobile homes, tenants, and condo unit owners exposure;
 - h. The methods used to incorporate the estimated time required to repair or replace the property;
 - i. The methodology and available validation for determining the extent of infrastructure damage and its effect on time element costs.
5. Justify changes from the previously accepted submission in the relativities between vulnerability functions for building and the corresponding vulnerability functions for time element.
6. To the extent that historical data are used to develop mathematical depictions of time element vulnerability functions, demonstrate the goodness-of-fit of the data to fitted models.

V-3 Mitigation Measures*

*(*Significant Revision)*

A. Modeling of mitigation measures to improve a building's wind resistance and the corresponding effects on vulnerability shall be theoretically sound and consistent with fundamental engineering principles. These measures shall include fixtures or construction techniques that enhance the performance of the building and its contents and shall consider:

- **Roof strength**
- **Roof covering performance**
- **Roof-to-wall strength**
- **Wall-to-floor-to-foundation strength**
- **Opening protection**
- **Window, door, and skylight strength.**

B. Application of mitigation measures that enhance the performance of the building and its contents shall be justified as to the impact on reducing damage whether done individually or in combination.

Purpose: Florida Statutes require rate filings to include, but not be limited to, the fixtures or construction techniques listed in this standard. Subsequent Florida Office of Insurance Regulation Informational Memorandum 02-0470M refers to a public domain study and further defines the items required:

1. Enhanced roof strength. Example: Braced gable end roof.
2. Enhanced roof covering performance. Example: Roof covering materials that comply with the Florida Building Code (110 mph rated shingle).
3. Enhanced roof-to-wall strength. Example: Hurricane clips or straps, increased size or decreased spacing of nails in roof deck attachment.
4. Enhanced wall-to-floor-to-foundation strength. Example: Stronger anchor bolts or closer spacing of anchors.
5. Opening protection. Example: Shutter products.
6. Window, door (entry doors, garage doors, and sliding glass doors), and skylight strength. Example: Impact resistant glazing, entry doors, garage doors, and sliding glass doors of various strengths.

Also listed are items that shall be considered:

1. Roof shape – hip roof (sloping ends and sloping sides down to the roof eaves line).

2. Wall construction – wood frame, unreinforced or reinforced masonry.
3. Opening protection for non-glazed openings – doors and garage doors.
4. Gable end bracing for roof shapes other than hip roof.

It is necessary to account for the total impact that the use of multiple mitigation measures will have on damage. When multiple mitigation measures are used, the effect on damage may not be the sum of the effects of the individual measures.

Relevant Forms: G-4, Vulnerability Standards Expert Certification
V-2, Mitigation Measures – Range of Changes in Damage
V-3, Mitigation Measures – Mean Damage Ratios and Loss Costs
(Trade Secret item)
A-6, Logical Relationship to Risk (Trade Secret item)

Disclosures

1. Describe any modifications to mitigation measures in the model since the previously accepted model.
2. Provide a completed Form V-2, Mitigation Measures – Range of Changes in Damage. Provide a link to the location of the form here.
3. Provide a description of the mitigation measures used by the model that are not listed in Form V-2, Mitigation Measures – Range of Changes in Damage.
4. Describe how mitigation is implemented in the model. Identify any assumptions.
5. Describe the process used to ensure that multiple mitigation factors are correctly combined in the model.

Audit

1. Modifications to mitigation measures in the model since the previously accepted model will be reviewed in detail, including the rationale for the modifications, the scope of the modifications, the process, the resulting modifications, and their impacts on the vulnerability component. Comparisons with the previously accepted model will be reviewed.
2. Form V-2 (Mitigation Measures – Range of Changes in Damage) and Form V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item) provide the information used in auditing this standard.
3. Individual mitigation measures as well as their effect on damage due to use of multiple mitigation measures will be reviewed. Any variation in the change over the

range of windspeeds for individual and multiple mitigation measures will be reviewed.

4. Mitigation measures used by the model that are not listed as required in this standard will be disclosed and shown to be theoretically sound and reasonable.

Form V-1: One Hypothetical Event

- A. Windspeeds for 96 ZIP Codes and sample personal and commercial residential exposure data are provided in the file named “*FormVIInput13.xlsx*.” The windspeeds and ZIP Codes represent a hypothetical hurricane track. Model the sample personal and commercial residential exposure data provided in the file against these windspeeds at the specified ZIP Codes and provide the damage ratios summarized by windspeed (mph) and construction type.

The windspeeds provided are one-minute sustained 10-meter windspeeds. The sample personal and commercial residential exposure data provided consists of four structures (one of each construction type – wood frame, masonry, mobile home, and concrete) individually placed at the population centroid of each of the ZIP Codes provided. Each ZIP Code is subjected to a specific windspeed. For completing Part A, Estimated Damage for each individual windspeed range is the sum of ground up loss to all structures in the ZIP Codes subjected to that individual windspeed range, excluding demand surge and storm surge. Subject Exposure is all exposures in the ZIP Codes subjected to that individual windspeed range. For completing Part B, Estimated Damage is the sum of the ground up loss to all structures of a specific type (wood frame, masonry, mobile home, or concrete) in all of the windspeed ranges, excluding demand surge and storm surge. Subject Exposure is all exposures of that specific type in all of the ZIP Codes.

One reference structure for each of the construction types shall be placed at the population centroid of the ZIP Codes. Do not include contents, appurtenant structures, or time element coverages.

<p><u>Reference Frame Structure:</u></p> <ul style="list-style-type: none"> One story Unbraced gable end roof Normal shingles (55mph) ½” plywood deck 6d nails, deck to roof members Toe nail truss to wall anchor Wood framed exterior walls 5/8” diameter anchors at 48” centers for wall/floor/foundation connections No shutters Standard glass windows No door covers No skylight covers Constructed in 1980 	<p><u>Reference Masonry Structure:</u></p> <ul style="list-style-type: none"> One story Unbraced gable end roof Normal shingles (55mph) ½” plywood deck 6d nails, deck to roof members Toe nail truss to wall anchor Masonry exterior walls No vertical wall reinforcing No shutters Standard glass windows No door covers No skylight covers Constructed in 1980
<p><u>Reference Mobile Home Structure:</u></p> <ul style="list-style-type: none"> Tie downs Single unit Manufactured in 1980 	<p><u>Reference Concrete Structure:</u></p> <ul style="list-style-type: none"> Twenty story Eight apartment units per story No shutters Standard glass windows Constructed in 1980

- B. Confirm that the structures used in completing the form are identical to those in the above table for the reference structures. If additional assumptions are necessary to complete this form (for example, regarding structural characteristics, duration, or surface roughness), provide the reasons why the assumptions were necessary as well as a detailed description of how they were included.

- C. Provide a plot of the Form V-1 (One Hypothetical Event), Part A data.

Form V-1: One Hypothetical Event

Part A

Windspeed (mph)	Estimated Damage/ Subject Exposure
41 – 50	_____
51 – 60	_____
61 – 70	_____
71 – 80	_____
81 – 90	_____
91 – 100	_____
101 – 110	_____
111 – 120	_____
121 – 130	_____
131 – 140	_____
141 – 150	_____
151 – 160	_____
161 – 170	_____

Part B

Construction Type	Estimated Damage/ Subject Exposure
Wood Frame	_____
Masonry	_____
Mobile Home	_____
Concrete	_____

Form V-2: Mitigation Measures – Range of Changes in Damage

- A. Provide the change in the zero deductible personal residential reference building damage rate (not loss cost) for each individual mitigation measure listed in Form V-2 (Mitigation Measures – Range of Changes in Damage) as well as for the combination of the four mitigation measures provided for the Mitigated Frame Building and the Mitigated Masonry Building below.
- B. If additional assumptions are necessary to complete this form (for example, regarding duration or surface roughness), provide the rationale for the assumptions as well as a detailed description of how they are included.
- C. Provide this form in Excel format without truncation. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form V-2 (Mitigation Measures – Range of Changes in Damage) shall also be included in a submission appendix.

<p><u>Reference Frame Building:</u></p> <ul style="list-style-type: none"> One story Unbraced gable end roof Normal shingles (55mph) ½” plywood deck 6d nails, deck to roof members Toe nail truss to wall anchor Wood framed exterior walls 5/8” diameter anchors at 48” centers for wall/floor/foundation connections No shutters Standard glass windows No door covers No skylight covers Constructed in 1980 	<p><u>Reference Masonry Building:</u></p> <ul style="list-style-type: none"> One story Unbraced gable end roof Normal shingles (55mph) ½” plywood deck 6d nails, deck to roof members Toe nail truss to wall anchor Masonry exterior walls No vertical wall reinforcing No shutters Standard glass windows No door covers No skylight covers Constructed in 1980
<p><u>Mitigated Frame Building:</u></p> <ul style="list-style-type: none"> Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters 	<p><u>Mitigated Masonry Building:</u></p> <ul style="list-style-type: none"> Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters

Reference and mitigated buildings are fully insured building structures with a zero deductible building only policy.

Place the reference building at the population centroid for ZIP Code 33921.

Windspeeds used in the form are one-minute sustained 10-meter windspeeds.

Form V-2: Mitigation Measures – Range of Changes in Damage

INDIVIDUAL MITIGATION MEASURES		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE) * 100									
		FRAME BUILDING					MASONRY BUILDING				
		WINDSPEED (MPH)					WINDSPEED (MPH)				
		60	85	110	135	160	60	85	110	135	160
	REFERENCE BUILDING										
ROOF STRENGTH	BRACED GABLE ENDS										
	HIP ROOF										
ROOF COVERING	METAL										
	RATED SHINGLES (110 MPH)										
	MEMBRANE										
	NAILING OF DECK										8d
ROOF-WALL STRENGTH											
	CLIPS										
	STRAPS										
WALL-FLOOR STRENGTH	TIES OR CLIPS										
	STRAPS										
WALL-FOUNDATION STRENGTH	LARGER ANCHORS OR CLOSER SPACING										
	STRAPS										
	VERTICAL REINFORCING										
OPENING PROTECTION	WINDOW SHUTTERS	PLYWOOD									
		STEEL									
		ENGINEERED									
	DOOR AND SKYLIGHT COVERS										
WINDOW, DOOR, SKYLIGHT STRENGTH	WINDOWS	LAMINATED									
		IMPACT GLASS									
	ENTRY DOORS	HIGH STRENGTH									
	GARAGE DOORS	HIGH STRENGTH									
	SLIDING GLASS DOORS	HIGH STRENGTH									
	SKYLIGHT	IMPACT GLASS									
MITIGATION MEASURES IN COMBINATION		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE) * 100									
		FRAME BUILDING					MASONRY BUILDING				
		WINDSPEED (MPH)					WINDSPEED (MPH)				
		60	85	110	135	160	60	85	110	135	160
BUILDING											
	MITIGATED BUILDING										

**Form V-3: Mitigation Measures – Mean Damage Ratios and Loss Costs
(Trade Secret Item)**

- A. Provide the mean damage ratio (prior to any insurance considerations) to the reference building for each individual mitigation measure listed in Form V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item) as well as the percent damage for the combination of the four mitigation measures provided for the Mitigated Frame Building and the Mitigated Masonry Building below.
- B. Provide the loss cost rounded to three decimal places, for the reference building and for each individual mitigation measure listed in Form V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item) as well as the loss cost for the combination of the four mitigation measures provided for the Mitigated Frame Building and the Mitigated Masonry Building below.
- C. If additional assumptions are necessary to complete this form (for example, regarding duration or surface roughness), provide the rationale for the assumptions as well as a detailed description of how they are included.
- D. Provide a graphical representation of the vulnerability curves for the reference and the fully mitigated building.

<p><u>Reference Frame Building:</u> One story Unbraced gable end roof Normal shingles (55mph) ½” plywood deck 6d nails, deck to roof members Toe nail truss to wall anchor Wood framed exterior walls 5/8” diameter anchors at 48” centers for wall/floor/foundation connections No shutters Standard glass windows No door covers No skylight covers Constructed in 1980</p>	<p><u>Reference Masonry Building:</u> One story Unbraced gable end roof Normal shingles (55mph) ½” plywood deck 6d nails, deck to roof members Toe nail truss to wall anchor Masonry exterior walls No vertical wall reinforcing No shutters Standard glass windows No door covers No skylight covers Constructed in 1980</p>
<p><u>Mitigated Frame Building:</u> Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters</p>	<p><u>Mitigated Masonry Building:</u> Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters</p>

Reference and mitigated buildings are fully insured building structures with a zero deductible building only policy.

Place the reference building at the population centroid for ZIP Code 33921.

Windspeeds used in the form are one-minute sustained 10-meter windspeeds.

Form V-3: Mitigation Measures – Mean Damage Ratios and Loss Costs (Trade Secret Item)

INDIVIDUAL MITIGATION MEASURES		MEAN DAMAGE RATIO										LOSS COSTS	
		FRAME BUILDING					MASONRY BUILDING					FRAME BUILDING	MASONRY BUILDING
		WINDSPEED (MPH)					WINDSPEED (MPH)					ACROSS ALL WINDSPEEDS	
		60	85	110	135	160	60	85	110	135	160		
ROOF STRENGTH	REFERENCE BUILDING												
	BRACED GABLE ENDS												
	HIP ROOF												
ROOF COVERING	METAL												
	RATED SHINGLES (110 MPH)												
	MEMBRANE												
	NAILING OF DECK	8d											
ROOF-WALL STRENGTH													
	CLIPS												
	STRAPS												
WALL-FLOOR STRENGTH													
	TIES OR CLIPS												
	STRAPS												
WALL-FOUNDATION STRENGTH	LARGER ANCHORS OR CLOSER SPACING						—	—	—	—	—		—
	STRAPS						—	—	—	—	—		—
	VERTICAL REINFORCING	—	—	—	—	—						—	
OPENING PROTECTION	WINDOW SHUTTERS	PLYWOOD											
		STEEL											
		ENGINEERED											
	DOOR AND SKYLIGHT COVERS												
WINDOW, DOOR, SKYLIGHT STRENGTH	WINDOWS	LAMINATED											
		IMPACT GLASS											
	ENTRY DOORS	HIGH STRENGTH											
	GARAGE DOORS	HIGH STRENGTH											
	SLIDING GLASS DOORS	HIGH STRENGTH											
	SKYLIGHT	IMPACT GLASS											
MITIGATION MEASURES IN COMBINATION		MEAN DAMAGE RATIO										LOSS COSTS	
		FRAME BUILDING					MASONRY BUILDING					FRAME BUILDING	MASONRY BUILDING
		WINDSPEED (MPH)					WINDSPEED (MPH)					ACROSS ALL WINDSPEEDS	
		60	85	110	135	160	60	85	110	135	160		
BUILDING	MITIGATED BUILDING												

ACTUARIAL STANDARDS

A-1 Modeling Input Data

- A. When used in the modeling process or for verification purposes, adjustments, edits, inclusions, or deletions to insurance company input data used by the modeling organization shall be based upon accepted actuarial, underwriting, and statistical procedures.***
- B. All modifications, adjustments, assumptions, inputs and input file identification, and defaults necessary to use the model shall be actuarially sound and shall be included with the model output report. Treatment of missing values for user inputs required to run the model shall be actuarially sound and described with the model output report.***

Purpose: Modeled loss costs and probable maximum loss levels rely on certain insurer input data assumptions. Implicit assumptions may or may not be appropriate for use by a given insurer, depending on the circumstances.

Relevant Form: G-5, Actuarial Standards Expert Certification

Disclosures

1. Identify depreciation assumptions and describe the methods and assumptions used to reduce insured losses on account of depreciation. Provide a sample calculation for determining the amount of depreciation and the actual cash value (ACV) losses.
2. Identify insurance-to-value assumptions and describe the methods and assumptions used to determine the true property value and associated losses. Provide a sample calculation for determining the property value and guaranteed replacement cost losses.
3. Describe the methods used to distinguish among policy form types (e.g., homeowners, dwelling property, mobile home, tenants, condo unit owners).
4. Disclose, in a model output report, the specific type of input that is required to use the model or model output in a residential property insurance rate filing. Such input includes, but is not limited to, optional features of the model, type of data to be supplied by the model user and needed to derive loss projections from the model, and any variables that a model user is authorized to set in using the model. Include the model name and version identification on the model output report. All items included in the output form submitted to the Commission shall be clearly labeled and defined.
5. Provide a copy of the input form(s) used in the model with options chosen to reflect the Florida hurricane model under review. Describe the process followed by the user

to generate the model output produced from the input form. Include the model name and version identification on the input form. All items included in the input form submitted to the Commission shall be clearly labeled and defined.

6. Describe actions performed to ensure the validity of insurer data used for model inputs or validation/verification.

Audit

1. Quality assurance procedures shall include methods to assure accuracy of insurance data. Compliance with this standard will be readily demonstrated through documented rules and procedures.
2. All model inputs and assumptions will be reviewed to determine that the model output report appropriately discloses all modifications, adjustments, assumptions, and defaults used to produce the loss costs.

A-2 Event Definition

A. Modeled loss costs and probable maximum loss levels shall reflect all insured wind related damages from storms that reach hurricane strength and produce minimum damaging windspeeds or greater on land in Florida.

B. Time element loss costs shall reflect losses due to infrastructure damage caused by a hurricane.

Purpose: Loss costs and probable maximum loss levels should reflect the losses insurers pay as a result of a hurricane.

Loss costs and probable maximum loss levels should only include insured wind related damages and time element losses in Florida resulting from an event modeled as a hurricane consistent with Florida Statutes. The event shall include all such insured wind related damage caused by a hurricane that makes landfall in Florida as a hurricane or by-passes Florida as a hurricane but comes close enough to cause damaging winds in Florida.

Relevant Forms: G-5, Actuarial Standards Expert Certification
A-2, Base Hurricane Storm Set Statewide Losses

Disclosures

1. Describe how damage from model generated storms (landfalling and by-passing) is excluded or included in the calculation of loss costs and probable maximum loss levels for the state of Florida.
2. Describe how damage resulting from concurrent or preceding flood or hurricane storm surge is treated in the calculation of loss costs and probable maximum loss levels for the state of Florida.

Audit

1. The model will be reviewed to determine that the definition of an event in the model is consistent with this standard.
2. The model will be reviewed to determine that by-passing storms and their effects are considered in a manner that is consistent with this standard.
3. The model will be reviewed to determine whether (if so, how) the model takes into account flood or hurricane storm surge.

A-3 Coverages*

(*Significant Revision)

- A. The methods used in the development of building loss costs shall be actuarially sound.**
- B. The methods used in the development of appurtenant structure loss costs shall be actuarially sound.**
- C. The methods used in the development of contents loss costs shall be actuarially sound.**
- D. The methods used in the development of time element coverage loss costs shall be actuarially sound.**

Purpose: A reasonable representation of building, appurtenant structure, contents, and time element losses is necessary in order to address policies that principally cover building, appurtenant structure, contents and time element, such as tenants and condo unit owners policies.

Relevant Form: G-5, Actuarial Standards Expert Certification

Disclosures

1. Describe the methods used in the model to calculate loss costs for building coverage associated with personal and commercial residential properties.
2. Describe the methods used in the model to calculate loss costs for appurtenant structure coverage associated with personal and commercial residential properties.
3. Describe the methods used in the model to calculate loss costs for contents coverage associated with personal and commercial residential properties.
4. Describe the methods used in the model to calculate loss costs for time element coverage associated with personal and commercial residential properties.

Audit

1. The methods used to produce building, appurtenant structure, contents and time element loss costs and probable maximum loss levels will be reviewed.

A-4 Modeled Loss Cost and Probable Maximum Loss Considerations

- A. Loss cost projections and probable maximum loss levels shall not include expenses, risk load, investment income, premium reserves, taxes, assessments, or profit margin.***
- B. Loss cost projections and probable maximum loss levels shall not make a prospective provision for economic inflation.***
- C. Loss cost projections and probable maximum loss levels shall not include any explicit provision for direct hurricane storm surge losses.***
- D. Loss cost projections and probable maximum loss levels shall be capable of being calculated from exposures at a geocode (latitude-longitude) level of resolution.***
- E. Demand surge shall be included in the model's calculation of loss costs and probable maximum loss levels using relevant data.***
- F. The methods, data, and assumptions used in the estimation of demand surge shall be actuarially sound.***

Purpose: The loss costs and probable maximum loss levels from the model should reflect losses paid by the insurance company as insurance claims resulting from wind damage from an event as defined in Standard A-2 (Event Definition).

Loss costs represent the expected annual loss per \$1,000 exposure. Other “expense and profit loads” such as those listed in the standard are included in rate filings and are calculated outside the scope of the Commission.

Loss severity is influenced by general economic inflation applicable to material and labor. Amounts of insurance may also be influenced (although perhaps differently) by economic inflation. Economic inflation is an element of past insurance experience that has been used to construct and validate hurricane loss projection models.

Hurricane storm surge is covered by the National Flood Insurance Program or in some cases by other policies, but normally not covered by private insurance market personal residential property policies that cover the wind peril.

Demand surge is recognized as an important element for modeling.

Relevant Form: G-5, Actuarial Standards Expert Certification

Disclosures

1. Describe the method or methods used to estimate annual loss costs and probable maximum loss levels. Identify any source documents used and research performed.
2. Identify the highest level of resolution for which loss costs and probable maximum loss levels can be provided. Identify all possible resolutions available for the reported output ranges.
3. Describe how the model incorporates demand surge in the calculation of loss costs and probable maximum loss levels.
4. Provide citations to published papers, if any, that were used to develop how the model estimates demand surge.

Audit

1. Describe how the model handles expenses, risk load, investment income, premium reserves, taxes, assessments, profit margin, economic inflation, and any criteria other than direct property insurance claim payments.
2. The method of inclusion of secondary uncertainty in the probable maximum loss levels will be examined.
3. Provide the data and methods used to incorporate individual aspects of demand surge on personal and commercial residential coverages, inclusive of the effects from building material costs, labor costs, contents costs, repair time, etc.
4. Provide a detailed description of how the model accounts for hurricane storm surge losses.
5. All referenced literature will be reviewed to determine applicability.

A-5 Policy Conditions

- A. The methods used in the development of mathematical distributions to reflect the effects of deductibles and policy limits shall be actuarially sound.**
- B. The relationship among the modeled deductible loss costs shall be reasonable.**
- C. Deductible loss costs shall be calculated in accordance with s. 627.701(5)(a), F.S.**

Purpose: For a given windspeed and building type, there is a range of possible results. Some losses may fall completely below the deductible. The distribution of losses is therefore important to the determination of the effects of deductibles and policy limits.

The determination of insurance coverage for a commercial residential policy is dependent upon the contractual responsibility of the condo unit owner or condo unit renter and that of the condominium association and the building owner. It is important that these responsibilities be appropriately accounted for in modeling loss cost projections and commercial residential probable maximum loss levels.

Relevant Form: G-5, Actuarial Standards Expert Certification

Disclosures

1. Describe the methods used in the model to treat deductibles (both flat and percentage), policy limits, replacement costs, and insurance-to-value when projecting loss costs.
2. Provide an example of how insurer loss (loss net of deductibles) is calculated. Discuss data or documentation used to confirm or validate the method used by the model.

Example:

(A)		(B)	(C)	(D)=(A)*(C)	(E)=(D)-(B)
Building Value	Policy Limit	Deductible	Damage Ratio	Zero Deductible Loss	Loss Net of Deductible
100,000	90,000	500	2%	2,000	1,500

3. Describe how the model calculates annual deductibles.

Audit

1. Describe the process used to determine the accuracy of the insurance-to-value criteria in data used to develop or validate the model results.
2. To the extent that historical data are used to develop mathematical depictions of deductibles and policy limits, demonstrate the goodness-of-fit of the data to fitted models.
3. To the extent that historical data are used to validate the model results, the treatment of the effects of deductibles, policy limits, and coinsurance in the data will be reviewed.
4. Justify changes from the previously accepted submission in the relativities among corresponding deductible amounts for the same coverage.

A-6 Loss Output*

*(*Significant Revision)*

- A. The methods, data, and assumptions used in the estimation of probable maximum loss levels shall be actuarially sound.**
- B. Loss costs shall not exhibit an illogical relation to risk, nor shall loss costs exhibit a significant change when the underlying risk does not change significantly.**
- C. Loss costs produced by the model shall be positive and non-zero for all valid Florida ZIP Codes.**
- D. Loss costs cannot increase as the quality of construction type, materials and workmanship increases, all other factors held constant.**
- E. Loss costs cannot increase as the presence of fixtures or construction techniques designed for hazard mitigation increases, all other factors held constant.**
- F. Loss costs cannot increase as the quality of building codes and enforcement increases, all other factors held constant.**
- G. Loss costs shall decrease as deductibles increase, all other factors held constant.**
- H. The relationship of loss costs for individual coverages, (e.g., buildings and appurtenant structures, contents, and time element) shall be consistent with the coverages provided.**
- I. Output ranges shall be logical for the type of risk being modeled and deviations supported.**
- J. All other factors held constant, output ranges produced by the model shall in general reflect lower loss costs for:**
 - 1. masonry construction versus frame construction,**
 - 2. personal residential risk exposure versus mobile home risk exposure,**
 - 3. inland counties versus coastal counties, and**
 - 4. northern counties versus southern counties.**

A-6 Loss Output (Continued)

K. For loss cost and probable maximum loss level estimates derived from or validated with historical insured hurricane losses, the assumptions in the derivations concerning (1) construction characteristics, (2) policy provisions, (3) coinsurance, (4) contractual provisions, and (5) relevant underwriting practices underlying those losses, as well as any actuarial modifications, shall be appropriate based on the type of risk being modeled.

Purpose: Reinsurance and other capital market products pricing, retention levels and limits for catastrophe reinsurance treaties, and rating agency capital adequacy determinations are frequently based upon probable maximum loss levels. This standard is to ensure that probable maximum loss levels are based on an actuarially sound methodology.

Modeled loss costs shall vary according to risk. If the risk of loss due to hurricanes is higher for one area or building type, then the loss costs shall also be higher. Likewise, if there is no difference in risk there shall be no difference in loss costs. Loss costs not having these properties have an illogical relation to risk.

Updates or revisions to the model lead to changes in the output ranges which shall be reasonable. This standard requires that the impacts on the loss costs are actually attributable to the updates or revisions.

Relevant Forms: G-5, Actuarial Standards Expert Certification
A-1, Zero Deductible Personal Residential Loss Costs by ZIP Code
A-2, Base Hurricane Storm Set Statewide Losses
A-3A, 2004 Hurricane Season Losses (2007 FHCF Exposure Data)
A-3B, 2004 Hurricane Season Losses (2012 FHCF Exposure Data)
A-4A, Output Ranges (2007 FHCF Exposure Data)
A-4B, Output Ranges (2012 FHCF Exposure Data)
A-5, Percentage Change in Output Ranges (2007 FHCF Exposure Data)
A-6, Logical Relationship to Risk (Trade Secret item)
A-7, Percentage Change in Logical Relationship to Risk
A-8, Probable Maximum Loss for Florida
S-2A, Examples of Loss Exceedance Estimates (2007 FHCF Exposure Data)
S-2B, Examples of Loss Exceedance Estimates (2012 FHCF Exposure Data)
S-5, Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled

Disclosures

1. Provide a completed Form A-1, Zero Deductible Personal Residential Loss Costs by ZIP Code. Provide a link to the location of the form here.
2. Provide a completed Form A-2, Base Hurricane Storm Set Statewide Losses. Provide a link to the location of the form here.
3. Provide a completed Form A-3A, 2004 Hurricane Season Losses, using the 2007 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data. Provide a link to the location of the form here.
4. Provide a completed Form A-3B, 2004 Hurricane Season Losses, using the 2012 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data. Provide a link to the location of the form here.
5. Provide a completed Form A-4A, Output Ranges, using the 2007 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data. Provide a link to the location of the form here.
6. Provide a completed Form A-4B, Output Ranges, using the 2012 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data. Provide a link to the location of the form here.
7. Provide a completed Form A-5, Percentage Change in Output Ranges, using the 2007 Florida Hurricane Catastrophe Fund aggregate personal and commercial residential exposure data. Provide a link to the location of the form here.
8. A completed Form A-6, Logical Relationship to Risk (Trade Secret item) shall be provided during the closed meeting portion of the Commission meeting to review the model for acceptability.
9. Provide a completed Form A-7, Percentage Change in Logical Relationship to Risk. Provide a link to the location of the form here.
10. Provide a completed Form A-8, Probable Maximum Loss for Florida. Provide a link to the location of the form here.
11. Describe how the model produces probable maximum loss levels.
12. Provide citations to published papers, if any, that were used to estimate probable maximum loss levels.
13. Describe how the probable maximum loss levels produced by the model include the effects of personal and commercial residential insurance coverage.

14. Explain any difference between the values provided on Form A-8 (Probable Maximum Loss for Florida) and those provided on Form S-2B (Examples of Loss Exceedance Estimates, 2012 FHCF Exposure Data).
15. Provide an explanation for all anomalies in the loss costs that are not consistent with the requirements of this standard.
16. Provide an explanation of the differences in output ranges between the previously accepted submission and the current submission.
17. Identify the assumptions used to account for the effects of coinsurance on commercial residential loss costs.
18. Describe how loss adjustment expenses are considered within the loss cost and probable maximum loss level estimates.

Audit

1. Provide the data and methods used for probable maximum loss levels for Form A-8 (Probable Maximum Loss for Florida). Describe the hurricane associated with the Top Event.
2. All referenced literature will be reviewed to determine applicability.
3. Graphical representations of loss costs by ZIP Code and county will be reviewed.
4. Color-coded maps depicting the effects of land friction on loss costs by ZIP Code will be reviewed.
5. The procedures used by the modeling organization to verify the individual loss cost relationships will be reviewed. Forms A-1 (Zero Deductible Personal Residential Loss Costs by ZIP Code), A-2 (Base Hurricane Storm Set Statewide Losses), A-3A (2004 Hurricane Season Losses, 2007 FHCF Exposure Data), A-3B (2004 Hurricane Season Losses, 2012 FHCF Exposure Data), A-6 (Logical Relationship to Risk, Trade Secret item), and A-7 (Percentage Change in Logical Relationship to Risk) will be used to assess coverage relationships.
6. Demonstrate that loss cost relationships among deductible, construction type, policy form, coverage, building code/enforcement, building strength, condo unit floor, number of stories, territory, and region are consistent and reasonable.
7. The total personal and commercial residential insured losses provided in Forms A-2 (Base Hurricane Storm Set Statewide Losses), A-3A (2004 Hurricane Season Losses, 2007 FHCF Exposure Data), and A-3B (2004 Hurricane Season Losses, 2012 FHCF Exposure Data) will be reviewed individually for total personal residential and total commercial residential insured losses.

8. Forms A-4A (Output Ranges, 2007 FHCF Exposure Data), A-4B (Output Ranges, 2012 FHCF Exposure Data), and A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data) will be reviewed, including geographical representations of the data when applicable.
9. Justify all changes in loss costs from the previously accepted submission.
10. Forms A-4A (Output Ranges, 2007 FHCF Exposure Data) and A-4B (Output Ranges, 2012 FHCF Exposure Data) will be reviewed to ensure appropriate differentials among deductibles, coverage, and construction types.
11. Anomalies in the output range data will be reviewed and shall be justified.

Form A-1: Zero Deductible Personal Residential Loss Costs by ZIP Code

- A. Provide three maps, color-coded by ZIP Code (with a minimum of 6 value ranges), displaying zero deductible personal residential loss costs per \$1,000 of exposure for frame, masonry, and mobile home.
- B. Create exposure sets for these exhibits by modeling all of the buildings from Notional Set 3 described in the file “*NotionalInput13.xlsx*” geocoded to each ZIP Code centroid in the state, as provided in the model. Provide the predominant County name and the Federal Information Processing Standards (FIPS) Code associated with each ZIP Code centroid. Refer to the Notional Policy Specification below for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information.
- C. Provide, in the format given in the file named “*2013FormA1.xlsx*,” the underlying loss cost data rounded to 3 decimal places used for A. above in both Excel and PDF format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name.

Notional Policy Specifications

<u>Policy Type</u>	<u>Assumptions</u>
Owners	<p>Coverage A = Building</p> <ul style="list-style-type: none"> • Replacement Cost included subject to Coverage A limit • Ordinance or Law not included <p>Coverage B = Appurtenant Structures</p> <ul style="list-style-type: none"> • Replacement Cost included subject to Coverage B limit • Ordinance or Law not included <p>Coverage C = Contents</p> <ul style="list-style-type: none"> • Replacement Cost included subject to Coverage C limit <p>Coverage D = Time Element</p> <ul style="list-style-type: none"> • Time limit = 12 months • Per diem = \$150.00/day per policy, if used <p>✧ Loss costs per \$1,000 shall be related to the Coverage A limit.</p> <p>✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.</p> <p>✧ All-other perils deductible shall be \$500.</p>
Mobile Home	<p>Coverage A = Building</p> <ul style="list-style-type: none"> • Replacement Cost included subject to Coverage A limit <p>Coverage B = Appurtenant Structures</p> <ul style="list-style-type: none"> • Replacement Cost included subject to Coverage B limit

Coverage C = Contents

- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Time limit = 12 months
 - Per diem = \$150.00/day per policy, if used
- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ All-other perils deductible shall be \$500.

Form A-2: Base Hurricane Storm Set Statewide Losses

- A. Provide the total insured loss and the dollar contribution to the average annual loss assuming zero deductible policies for individual historical hurricanes using the Florida Hurricane Catastrophe Fund’s aggregate personal and commercial residential exposure data found in the files named “*hlpm2007c.exe*” and “*hlpm2012c.exe*.” The list of hurricanes in this form should include all Florida and by-passing hurricanes in the modeling organization Base Hurricane Storm Set, as defined in Standard M-1 (Base Hurricane Storm Set).

The table below contains the minimum number of hurricanes from HURDAT2 to be included in the Base Hurricane Storm Set, based on the 113-year period 1900-2012. Each hurricane has been assigned an ID number. As defined in Standard M-1 (Base Hurricane Storm Set), the Base Hurricane Storm Set for the modeling organization may exclude hurricanes that had zero modeled impact, or it may include additional hurricanes when there is clear justification for the changes. For hurricanes in the table below resulting in zero loss, the table entry should be left blank. Additional hurricanes included in the model’s Base Hurricane Storm Set shall be added to the table below in order of year and assigned an intermediate ID number as the hurricane falls within the bounding ID numbers.

- B. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form A-2 (Base Hurricane Storm Set Statewide Losses) shall also be included in a submission appendix.

				2007 FHCF Exposure Data		2012 FHCF Exposure Data	
ID	Landfall/ Closest Approach Date	Year	Name	Personal and Commercial Residential Insured Losses (\$)	Dollar Contribution	Personal and Commercial Residential Insured Losses (\$)	Dollar Contribution
005	08/15/1901	1901	NoName04-1901				
010	09/11/1903	1903	NoName03-1903				
015	10/17/1904	1904	NoName04-1904				
020	06/17/1906	1906	NoName02-1906				
025	09/27/1906	1906	NoName06-1906				
030	10/18/1906	1906	NoName08-1906				
035	10/11/1909	1909	NoName11-1909				
040	10/18/1910	1910	NoName05-1910				
045	08/11/1911	1911	NoName02-1911				
050	09/14/1912	1912	NoName04-1912				
055	08/01/1915	1915	NoName01-1915				
060	09/04/1915	1915	NoName04-1915				
065	07/05/1916	1916	NoName02-1916				
070	10/18/1916	1916	NoName14-1916				
075	09/29/1917	1917	NoName04-1917				
080	09/10/1919	1919	NoName02-1919				
085	10/25/1921	1921	TampaBay06-1921				

				2007 FHCF Exposure Data		2012 FHCF Exposure Data	
ID	Landfall/ Closest Approach Date	Year	Name	Personal and Commercial Residential Insured Losses (\$)	Dollar Contribution	Personal and Commercial Residential Insured Losses (\$)	Dollar Contribution
090	09/15/1924	1924	NoName05-1924				
095	10/21/1924	1924	NoName10-1924				
100	07/28/1926	1926	NoName01-1926				
105	09/18/1926	1926	GreatMiami07-1926				
110	10/21/1926	1926	NoName10-1926				
115	08/08/1928	1928	NoName01-1928				
120	09/17/1928	1928	LakeOkeechobee04-1928				
125	09/28/1929	1929	NoName02-1929				
130	09/01/1932	1932	NoName03-1932				
135	07/30/1933	1933	NoName05-1933				
140	09/04/1933	1933	NoName11-1933				
145	09/03/1935	1935	LaborDay03-1935				
150	11/04/1935	1935	NoName07-1935				
155	07/31/1936	1936	NoName05-1936				
160	08/11/1939	1939	NoName02-1939				
165	10/06/1941	1941	NoName05-1941				
170	10/18/1944	1944	NoName13-1944				
175	06/24/1945	1945	NoName01-1945				
180	09/15/1945	1945	NoName09-1945				
185	10/08/1946	1946	NoName05-1946				
190	09/17/1947	1947	NoName04-1947				
195	10/12/1947	1947	NoName08-1947				
200	09/22/1948	1948	NoName07-1948				
205	10/05/1948	1948	NoName08-1948				
210	08/27/1949	1949	NoName02-1949				
215	08/31/1950	1950	Baker-1950				
220	09/05/1950	1950	Easy-1950				
225	10/18/1950	1950	King-1950				
230	09/26/1953	1953	Florence-1953				
235	09/25/1956	1956	Flossy-1956				
240	09/10/1960	1960	Donna-1960				
245	08/27/1964	1964	Cleo-1964				
250	09/10/1964	1964	Dora-1964				
255	10/14/1964	1964	Isbell-1964				
260	09/08/1965	1965	Betsy-1965				
265	06/09/1966	1966	Alma-1966				
270	10/04/1966	1966	Inez-1966				
275	10/19/1968	1968	Gladys-1968				
280	06/19/1972	1972	Agnes-1972				
285	09/23/1975	1975	Eloise-1975				
290	09/04/1979	1979	David-1979				
295	09/13/1979	1979	Frederic-1979				
300	09/02/1985	1985	Elena-1985				
305	11/21/1985	1985	Kate-1985				

				2007 FHCF Exposure Data		2012 FHCF Exposure Data	
ID	Landfall/ Closest Approach Date	Year	Name	Personal and Commercial Residential Insured Losses (\$)	Dollar Contribution	Personal and Commercial Residential Insured Losses (\$)	Dollar Contribution
310	10/12/1987	1987	Floyd-1987				
315	08/24/1992	1992	Andrew-1992				
320	08/02/1995	1995	Erin-1995				
325	10/04/1995	1995	Opal-1995				
330	07/19/1997	1997	Danny-1997				
335	09/03/1998	1998	Earl-1998				
340	09/25/1998	1998	Georges-1998				
345	10/15/1999	1999	Irene-1999				
350	08/13/2004	2004	Charley-2004				
355	09/05/2004	2004	Frances-2004				
360	09/16/2004	2004	Ivan-2004				
365	09/26/2004	2004	Jeanne-2004				
370	0710/2005	2005	Dennis-2005				
375	08/25/2005	2005	Katrina-2005				
380	10/24/2005	2005	Wilma-2005				
			Total				

Note: Total dollar contributions should agree with the total average annual zero deductible statewide loss costs provided in Form S-5 (Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled), Part A and Part B for current year.

**Form A-3A: 2004 Hurricane Season Losses
(2007 FHCF Exposure Data)**

A. Provide the percentage of residential zero deductible losses, rounded to four decimal places, and the monetary contribution from Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) for each affected ZIP Code, individually and in total. Include all ZIP Codes where losses are equal to or greater than \$500,000.

Use the 2007 Florida Hurricane Catastrophe Fund’s aggregate personal and commercial residential exposure data found in the file named “*hlpm2007c.exe*.”

Rather than using directly a specified published windfield, the winds underlying the loss cost calculations must be produced by the model being evaluated and should be the same hurricane parameters as used in completing Form A-2 (Base Hurricane Storm Set Statewide Losses).

B. Provide maps color-coded by ZIP Code depicting the percentage of total residential losses from each hurricane, Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) and for the cumulative losses using the following interval coding:

Red	Over 5%
Light Red	2% to 5%
Pink	1% to 2%
Light Pink	0.5% to 1%
Light Blue	0.2% to 0.5%
Medium Blue	0.1% to 0.2%
Blue	Below 0.1%

The relevant storm track should be plotted on each map.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form A-3A (2004 Hurricane Season Losses, 2007 FHCF Exposure Data) shall also be included in a submission appendix.

A-3A	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)

**Form A-3B: 2004 Hurricane Season Losses
(2012 FHCF Exposure Data)**

A. Provide the percentage of residential zero deductible losses, rounded to four decimal places, and the monetary contribution from Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) for each affected ZIP Code, individually and in total. Include all ZIP Codes where losses are equal to or greater than \$500,000.

Use the 2012 Florida Hurricane Catastrophe Fund’s aggregate personal and commercial residential exposure data found in the file named “*hlpm2012c.exe*.”

Rather than using directly a specified published windfield, the winds underlying the loss cost calculations must be produced by the model being evaluated and should be the same hurricane parameters as used in completing Form A-2 (Base Hurricane Storm Set Statewide Losses).

B. Provide maps color-coded by ZIP Code depicting the percentage of total residential losses from each hurricane, Hurricane Charley (2004), Hurricane Frances (2004), Hurricane Ivan (2004), and Hurricane Jeanne (2004) and for the cumulative losses using the following interval coding:

Red	Over 5%
Light Red	2% to 5%
Pink	1% to 2%
Light Pink	0.5% to 1%
Light Blue	0.2% to 0.5%
Medium Blue	0.1% to 0.2%
Blue	Below 0.1%

The relevant storm track should be plotted on each map.

C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form A-3B (2004 Hurricane Season Losses, 2012 FHCF Exposure Data) shall also be included in a submission appendix.

A-3B	Hurricane Charley		Hurricane Frances		Hurricane Ivan		Hurricane Jeanne		Total	
ZIP Code	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)	Personal & Commercial Residential Monetary Contribution (\$)	Percent of Losses (%)

Form A-4A: Output Ranges (2007 FHCF Exposure Data)

- A. Provide personal and commercial residential output ranges in the format shown in the file named “2013FormA4A.xlsx” by using an automated program or script. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form A-4A (Output Ranges, 2007 FHCF Exposure Data) shall also be included in a submission appendix.
- B. Provide loss costs rounded to three (3) decimal places by county. Within each county, loss costs shall be shown separately per \$1,000 of exposure for frame owners, masonry owners, frame renters, masonry renters, frame condo unit owners, masonry condo unit owners, mobile home, and commercial residential. For each of these categories using ZIP Code centroids, the output range shall show the highest loss cost, the lowest loss cost, and the weighted average loss cost. The aggregate residential exposure data for this form shall be developed from the information in the file named “hlpm2007c.exe,” except for insured value and deductibles information. Insured values shall be based on the output range specifications below. Deductible amounts of 0% and as specified in the output range specifications will be assumed to be uniformly applied to all risks. When calculating the weighted average loss costs, weight the loss costs by the total insured value calculated above. Include the statewide range of loss costs (i.e., low, high, and weighted average).
- C. If a modeling organization has loss costs for a ZIP Code for which there is no exposure, give the loss costs zero weight (i.e., assume the exposure in that ZIP Code is zero). Provide a list in the submission document of those ZIP Codes where this occurs.
- D. If a modeling organization does not have loss costs for a ZIP Code for which there is some exposure, do not assume such loss costs are zero, but use only the exposures for which there are loss costs in calculating the weighted average loss costs. Provide a list in the submission document of the ZIP Codes where this occurs.
- E. All anomalies in loss costs that are not consistent with the requirements of Standard A-6 (Loss Output) and have been explained in Disclosure A-6.15 shall be shaded.

Indicate if per diem is used in producing loss costs for Coverage D (ALE) in the personal residential output ranges. If a per diem rate is used in the submission, a rate of \$150.00 per day per policy shall be used.

Output Range Specifications

<u>Policy Type</u>	<u>Assumptions</u>
--------------------	--------------------

Owners	Coverage A = Building <ul style="list-style-type: none">• Coverage A limit = \$100,000• Replacement Cost included subject to Coverage A limit• Ordinance or Law not included
---------------	---

Coverage B = Appurtenant Structures

- Coverage B limit = 10% of Coverage A limit
- Replacement Cost included subject to Coverage B limit
- Ordinance or Law not included

Coverage C = Contents

- Coverage C limit = 50% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage A.
- ✧ All-other perils deductible shall be \$500.

Renters

Coverage C = Contents

- Coverage C limit = \$25,000
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 40% of Coverage C limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominate Coverage = C.
- ✧ Loss costs per \$1,000 shall be related to the Coverage C limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage C.
- ✧ All-other perils deductible shall be \$500.

Condo Unit Owners Coverage A = Building

- Coverage A limit = 10% of Coverage C limit
- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Coverage C limit = \$50,000
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 40% of Coverage C limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = C.
- ✧ Loss costs per \$1,000 shall be related to the Coverage C limit.

- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage C.
- ✧ All-other perils deductible shall be \$500.

Mobile Home

Coverage A = Structure

- Coverage A limit = \$50,000
- Replacement Cost included subject to Coverage A limit

Coverage B = Appurtenant Structures

- Coverage B limit = 10% of Coverage A limit
- Replacement Cost included subject to Coverage B limit

Coverage C = Contents

- Coverage C limit = 50% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage A.
- ✧ All-other perils deductible shall be \$500.

Commercial Residential

Coverage A = Building

- Coverage A limit = \$750,000
- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Coverage C limit = 5% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 3% Deductible of Coverage A.
- ✧ All-other perils deductible shall be \$500.

Form A-4B: Output Ranges (2012 FHCF Exposure Data)

- A. Provide personal and commercial residential output ranges in the format shown in the file named “2013FormA4B.xlsx” by using an automated program or script. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form A-4B (Output Ranges, 2012 FHCF Exposure Data) shall also be included in a submission appendix.
- B. Provide loss costs rounded to three (3) decimal places by county. Within each county, loss costs shall be shown separately per \$1,000 of exposure for frame owners, masonry owners, frame renters, masonry renters, frame condo unit owners, masonry condo unit owners, mobile home, and commercial residential. For each of these categories using ZIP Code centroids, the output range shall show the highest loss cost, the lowest loss cost, and the weighted average loss cost. The aggregate residential exposure data for this form shall be developed from the information in the file named “hlpm2012c.exe,” except for insured value and deductibles information. Insured values shall be based on the output range specifications below. Deductible amounts of 0% and as specified in the output range specifications will be assumed to be uniformly applied to all risks. When calculating the weighted average loss costs, weight the loss costs by the total insured value calculated above. Include the statewide range of loss costs (i.e., low, high, and weighted average).
- C. If a modeling organization has loss costs for a ZIP Code for which there is no exposure, give the loss costs zero weight (i.e., assume the exposure in that ZIP Code is zero). Provide a list in the submission document of those ZIP Codes where this occurs.
- D. If a modeling organization does not have loss costs for a ZIP Code for which there is some exposure, do not assume such loss costs are zero, but use only the exposures for which there are loss costs in calculating the weighted average loss costs. Provide a list in the submission document of the ZIP Codes where this occurs.
- E. All anomalies in loss costs that are not consistent with the requirements of Standard A-6 (Loss Output) and have been explained in Disclosure A-6.15 shall be shaded.

Indicate if per diem is used in producing loss costs for Coverage D (ALE) in the personal residential output ranges. If a per diem rate is used in the submission, a rate of \$150.00 per day per policy shall be used.

Output Range Specifications

<u>Policy Type</u>	<u>Assumptions</u>
--------------------	--------------------

Owners	Coverage A = Building <ul style="list-style-type: none">• Coverage A limit = \$100,000• Replacement Cost included subject to Coverage A limit• Ordinance or Law not included
---------------	---

Coverage B = Appurtenant Structures

- Coverage B limit = 10% of Coverage A limit
- Replacement Cost included subject to Coverage B limit
- Ordinance or Law not included

Coverage C = Contents

- Coverage C limit = 50% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage A.
- ✧ All-other perils deductible shall be \$500.

Renters

Coverage C = Contents

- Coverage C limit = \$25,000
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 40% of Coverage C limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominate Coverage = C.
- ✧ Loss costs per \$1,000 shall be related to the Coverage C limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage C.
- ✧ All-other perils deductible shall be \$500.

Condo Unit Owners Coverage A = Building

- Coverage A limit = 10% of Coverage C limit
- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Coverage C limit = \$50,000
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 40% of Coverage C limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = C.
- ✧ Loss costs per \$1,000 shall be related to the Coverage C limit.

- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage C.
- ✧ All-other perils deductible shall be \$500.

Mobile Home

Coverage A = Building

- Coverage A limit = \$50,000
- Replacement Cost included subject to Coverage A limit

Coverage B = Appurtenant Structures

- Coverage B limit = 10% of Coverage A limit
- Replacement Cost included subject to Coverage B limit

Coverage C = Contents

- Coverage C limit = 50% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 2% Deductible of Coverage A.
- ✧ All-other perils deductible shall be \$500.

Commercial Residential

Coverage A = Building

- Coverage A limit = \$750,000
- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Coverage C limit = 5% of Coverage A limit
- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Coverage D limit = 20% of Coverage A limit
- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Dominant Coverage = A.
- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ 3% Deductible of Coverage A.
- ✧ All-other perils deductible shall be \$500.

Form A-5: Percentage Change in Output Ranges (2007 FHCF Exposure Data)

- A. Provide summaries of the percentage change in average loss cost output range data compiled in Form A-4A (Output Ranges, 2007 FHCF Exposure Data) relative to the equivalent data compiled from the previously accepted model in the format shown in the file named “2013FormA5.xlsx.”

For the change in output range exhibit, provide the summary by:

- Statewide (overall percentage change),
 - By region, as defined in *Figure 14* – North, Central and South,
 - By county, as defined in *Figure 15* – Coastal and Inland.
- B. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. All tables in Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data) shall also be included in a submission appendix.
- C. Provide color-coded maps by county reflecting the percentage changes in the average loss costs with specified deductibles for frame owners, masonry owners, frame renters, masonry renters, frame condo unit owners, masonry condo unit owners, mobile home, and commercial residential from the output ranges from the previously accepted model.

Counties with a negative percentage change (reduction in loss costs) shall be indicated with shades of blue; counties with a positive percentage change (increase in loss costs) shall be indicated with shades of red; and counties with no percentage change shall be white. The larger the percentage change in the county, the more intense the color-shade.

Figure 14

State of Florida by North/Central/South Regions

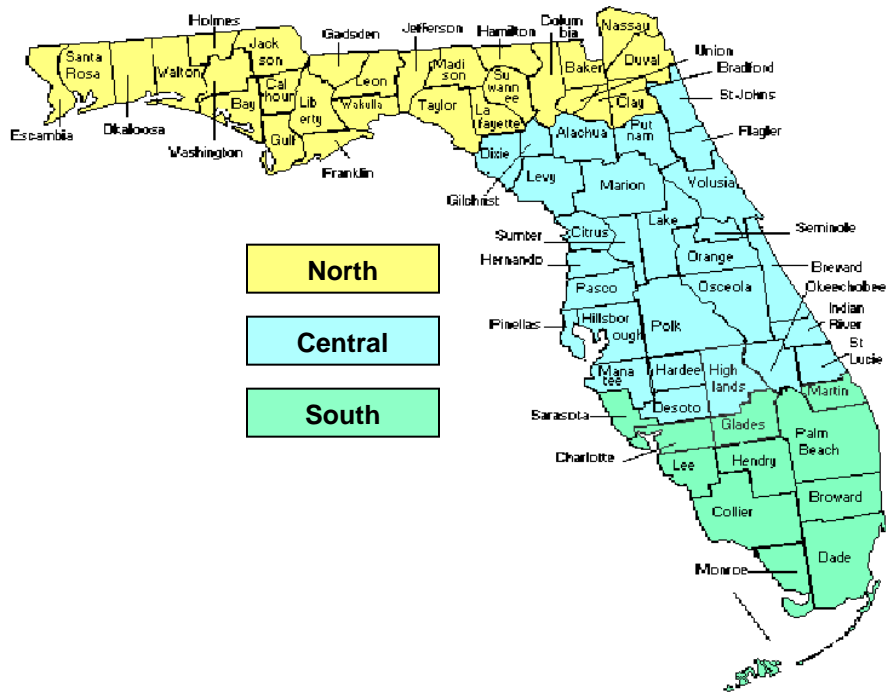
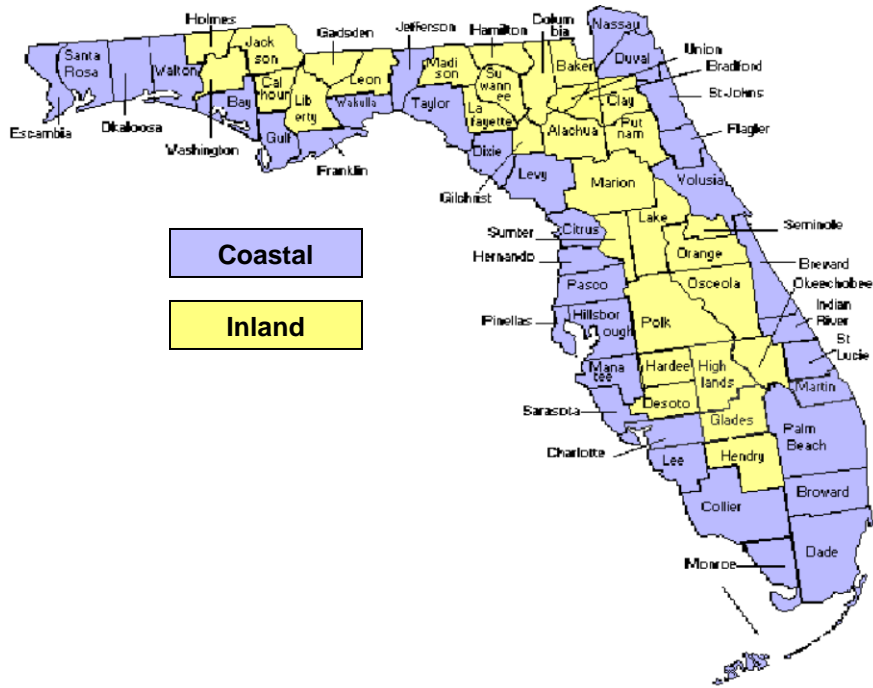


Figure 15

State of Florida by Coastal/Inland Counties



Form A-6: Logical Relationship to Risk (Trade Secret Item)

- A. Provide the logical relationship to risk exhibits in the format shown in the file named “2013FormA6.xlsx.”
- B. Create exposure sets for each exhibit by modeling all of the coverages from the appropriate Notional Set listed below at each of the locations in “Location Grid A” as described in the file “NotionalInput13.xlsx.” Refer to the Notional Policy Specifications below for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information.

Exhibit	Notional Set
Deductible Sensitivity	Set 1
Construction Sensitivity	Set 2
Policy Form Sensitivity	Set 3
Coverage Sensitivity	Set 4
Building Code/Enforcement (Year Built) Sensitivity	Set 5
Building Strength Sensitivity	Set 6
Condo Unit Floor Sensitivity	Set 7
Number of Stories Sensitivity	Set 8

Models shall treat points in Location Grid A as coordinates that would result from a geocoding process. Models shall treat points by simulating loss at exact location or by using the nearest modeled parcel/street/cell in the model.

Report results for each of the points in “Location Grid A” individually, unless specified. Loss cost per \$1,000 of exposure shall be rounded to 3 decimal places.

- C. All anomalies in loss costs that are not consistent with the requirements of Standard A-6 (Loss Output) and have been explained in Disclosure A-6.15 shall be shaded.
- D. Create an exposure set and report loss costs results for strong owners frame buildings (Notional Set 6) for each of the points in “Location Grid B” as described in the file “NotionalInput13.xlsx.” Provide a color-coded contour map of the loss costs. Provide a scatter plot of the loss costs (y-axis) against distance to closest coast (x-axis).

Notional Policy Specifications

Policy Type	Assumptions
-------------	-------------

Owners

Coverage A = Building

- Replacement Cost included subject to Coverage A limit
- Ordinance or Law not included

Coverage B = Appurtenant Structures

- Replacement Cost included subject to Coverage B limit
- Ordinance or Law not included

Coverage C = Contents

- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ All-other perils deductible shall be \$500.

Renters

Coverage C = Contents

- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Loss costs per \$1,000 shall be related to the Coverage C limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ All-other perils deductible shall be \$500.

Condo Unit Owners Coverage A = Building

- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Loss costs per \$1,000 shall be related to the Coverage C limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ All-other perils deductible shall be \$500.

Mobile Home

Coverage A = Building

- Replacement Cost included subject to Coverage A limit

Coverage B = Appurtenant Structures

- Replacement Cost included subject to Coverage B limit

Coverage C = Contents

- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ All-other perils deductible shall be \$500.

Commercial Residential

Coverage A = Building

- Replacement Cost included subject to Coverage A limit

Coverage C = Contents

- Replacement Cost included subject to Coverage C limit

Coverage D = Time Element

- Time limit = 12 months
- Per diem = \$150.00/day per policy, if used

- ✧ Loss costs per \$1,000 shall be related to the Coverage A limit.
- ✧ Loss costs for the various specified deductibles shall be determined based on annual deductibles.
- ✧ All-other perils deductible shall be \$500.

Form A-7: Percentage Change in Logical Relationship to Risk

- A. Provide summaries of the percentage change in logical relationship to risk exhibits from the previously accepted model in the format shown in the file named “*2013FormA7.xlsx*.”
- B. Create exposure sets for each exhibit by modeling all of the coverages from the appropriate Notional Set listed below at each of the locations in “Location Grid B” as described in the file “*NotionalInput13.xlsx*.” Refer to the Notional Policy Specifications provided in Form A-6 (Logical Relationship to Risk, Trade Secret item) for additional modeling information. Explain any assumptions, deviations, and differences from the prescribed exposure information.

Exhibit	Notional Set
Deductible Sensitivity	Set 1
Construction Sensitivity	Set 2
Policy Form Sensitivity	Set 3
Coverage Sensitivity	Set 4
Building Code/Enforcement (Year Built) Sensitivity	Set 5
Building Strength Sensitivity	Set 6
Condo Unit Floor Sensitivity	Set 7
Number of Stories Sensitivity	Set 8

Models shall treat points in Location Grid B as coordinates that would result from a geocoding process. Models shall treat points by simulating loss at exact location or by using the nearest modeled parcel/street/cell in the model.

Provide the results statewide (overall percentage change) and by the regions defined in Form A-5 (Percentage Change in Output Ranges, 2007 FHCF Exposure Data).

- C. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. All tables in Form A-7 (Percentage Change in Logical Relationship to Risk) shall also be included in a submission appendix.

Form A-8: Probable Maximum Loss for Florida

- A. Provide a detailed explanation of how the Expected Annual Hurricane Losses and Return Periods are calculated.
- B. Complete Part A showing the personal and commercial residential probable maximum loss for Florida. For the Expected Annual Hurricane Losses column, provide personal and commercial residential, zero deductible statewide loss costs based on the 2012 Florida Hurricane Catastrophe Fund's aggregate personal and commercial residential exposure data found in the file named "*hlp2012c.exe*."

In the column, Return Period (Years), provide the return period associated with the average loss within the ranges indicated on a cumulative basis.

For example, if the average loss is \$4,705 million for the range \$4,501 million to \$5,000 million, provide the return period associated with a loss that is \$4,705 million or greater.

For each loss range in millions (\$1,001-\$1,500, \$1,501-\$2,000, \$2,001-\$2,500) the average loss within that range should be identified and then the return period associated with that loss calculated. The return period is then the reciprocal of the probability of the loss equaling or exceeding this average loss size.

The probability of equaling or exceeding the average of each range should be smaller as the ranges increase (and the average losses within the ranges increase). Therefore, the return period associated with each range and average loss within that range should be larger as the ranges increase. Return periods shall be based on cumulative probabilities.

A return period for an average loss of \$4,705 million within the \$4,501-\$5,000 million range should be lower than the return period for an average loss of \$5,455 million associated with a \$5,001- \$6,000 million range.

- C. Provide a graphical comparison of the current submission Residential Return Periods loss curve to the previously accepted submission Residential Return Periods loss curve. Residential Return Period (Years) shall be shown on the *y*-axis on a log 10 scale with Losses in Billions shown on the *x*-axis. The legend shall indicate the corresponding submission with a solid line representing the current year and a dotted line representing the previously accepted submission.
- D. Provide the estimated loss and uncertainty interval for each of the Personal and Commercial Residential Return Periods given in Part B. Describe how the uncertainty intervals are derived.
- E. Provide this form in Excel format. The file name shall include the abbreviated name of the modeling organization, the standards year, and the form name. Form A-8 (Probable Maximum Loss for Florida) shall also be included in a submission appendix.

Part A – Personal and Commercial Residential Probable Maximum Loss for Florida

LOSS RANGE (MILLIONS)			TOTAL LOSS	AVERAGE LOSS (MILLIONS)	NUMBER OF HURRICANES	EXPECTED ANNUAL HURRICANE LOSSES*	RETURN PERIOD (YEARS)
\$ -	to	\$ 500					
\$ 501	to	\$ 1,000					
\$ 1,001	to	\$ 1,500					
\$ 1,501	to	\$ 2,000					
\$ 2,001	to	\$ 2,500					
\$ 2,501	to	\$ 3,000					
\$ 3,001	to	\$ 3,500					
\$ 3,501	to	\$ 4,000					
\$ 4,001	to	\$ 4,500					
\$ 4,501	to	\$ 5,000					
\$ 5,001	to	\$ 6,000					
\$ 6,001	to	\$ 7,000					
\$ 7,001	to	\$ 8,000					
\$ 8,001	to	\$ 9,000					
\$ 9,001	to	\$ 10,000					
\$ 10,001	to	\$ 11,000					
\$ 11,001	to	\$ 12,000					
\$ 12,001	to	\$ 13,000					
\$ 13,001	to	\$ 14,000					
\$ 14,001	to	\$ 15,000					
\$ 15,001	to	\$ 16,000					
\$ 16,001	to	\$ 17,000					
\$ 17,001	to	\$ 18,000					
\$ 18,001	to	\$ 19,000					
\$ 19,001	to	\$ 20,000					
\$ 20,001	to	\$ 21,000					
\$ 21,001	to	\$ 22,000					
\$ 22,001	to	\$ 23,000					
\$ 23,001	to	\$ 24,000					
\$ 24,001	to	\$ 25,000					
\$ 25,001	to	\$ 26,000					
\$ 26,001	to	\$ 27,000					
\$ 27,001	to	\$ 28,000					
\$ 28,001	to	\$ 29,000					
\$ 29,001	to	\$ 30,000					
\$ 30,001	to	\$ 35,000					
\$ 35,001	to	\$ 40,000					
\$ 40,001	to	\$ 45,000					
\$ 45,001	to	\$ 50,000					
\$ 50,001	to	\$ 55,000					
\$ 55,001	to	\$ 60,000					
\$ 60,001	to	\$ 65,000					
\$ 65,001	to	\$ 70,000					
\$ 70,001	to	\$ 75,000					
\$ 75,001	to	\$ 80,000					
\$ 80,001	to	\$ 90,000					
\$ 90,001	to	\$ 100,000					
\$ 100,001	to	\$ Maximum					
Total							

*Personal and commercial residential zero deductible statewide loss using 2012 FHCF personal and commercial residential exposure data (file name: *hlpm2012c.exe*).

Part B – Personal and Commercial Residential Probable Maximum Loss for Florida

Return Period (Years)	Estimated Loss Level	Uncertainty Interval
Top Event		
1,000		
500		
250		
100		
50		
20		
10		
5		

COMPUTER STANDARDS

C-1 Documentation

- A. Model functionality and technical descriptions shall be documented formally in an archival format separate from the use of letters, slides, and unformatted text files.***
- B. The modeling organization shall maintain a primary document repository, containing or referencing a complete set of documentation specifying the model structure, detailed software description, and functionality. Development of the documentation shall be indicative of accepted software engineering practices.***
- C. All computer software (i.e., user interface, scientific, engineering, actuarial, data preparation, and validation) relevant to the submission shall be consistently documented and dated.***
- D. The modeling organization shall maintain (1) a table of all changes in the model from the previously accepted submission to the initial submission this year and (2) a table of all substantive changes since this year's initial submission.***
- E. Documentation shall be created separately from the source code.***

Purpose: The primary document repository shall contain or reference all the elements of the model and its development.

In some cases, a user may be offsite, and in others, the users may be modeling organization personnel. In either case, clearly written documentation is necessary to maintain the consistency and survivability of the code, irrespective of specific modeling organization personnel.

Relevant Form: G-6, Computer Standards Expert Certification

Audit

1. The primary document repository, in either electronic or physical form, and its maintenance process will be reviewed. The repository shall contain or reference full documentation of the software.
2. All documentation shall be easily accessible from a central location.
3. Complete user documentation, including all recent updates, will be reviewed.

4. Modeling organization personnel, or their designated proxies, responsible for each aspect of the software (i.e., user interface, quality assurance, engineering, actuarial, verification) shall be present when the Computer Standards are being audited. Internal users of the software will be interviewed.
5. Provide verification that documentation is created separately from and is maintained consistently with the source code.
6. The tables specified in C-1.D that contain the items listed in Standard G-1(Scope of the Computer Model and Its Implementation), Disclosure 5 will be reviewed. The tables shall contain the item number in the first column. The remaining five columns shall contain specific document or file references for affected components or data relating to the following Computer Standards: C-2 (Requirements), C-3 (Model Architecture and Component Design), C-4 (Implementation), C-5 (Verification), and C-6 (Model Maintenance and Revision).
7. Trace the model changes specified in Standard G-1 (Scope of the Computer Model and Its Implementation), Disclosure 5 through all Computer Standards.

C-2 Requirements

The modeling organization shall maintain a complete set of requirements for each software component as well as for each database or data file accessed by a component. Requirements shall be updated whenever changes are made to the model.

Purpose: Software development begins with a thorough specification of requirements for each component, database, or data file accessed by a component. These requirements are frequently documented informally in natural language, with the addition of diagrams and other illustrations that aid both users and software engineers in specifying components, databases, or data files accessed by a component for the software product and process. Requirements drive the design and implementation of the model.

A typical division of requirements into categories would include:

1. ***Interface:*** For example, use the web browser Internet Explorer, with ActiveX technology, to show county and ZIP Code maps of Florida. Allow text search commands for browsing and locating counties.
2. ***Human Factors:*** For example, ZIP Code boundaries, and contents, can be scaled to the extent that the average user can visually identify residential home exposures marked with small circles.
3. ***Functionality:*** For example, make the software design at the topmost level a dataflow diagram containing the following components: HURRICANES, WINDFIELD, DAMAGE, and LOSS COSTS. Write the low-level code in Java.
4. ***Documentation:*** For example, use Acrobat PDF for the layout language, and add PDF hyperlinks in documents to connect the sub-documents.
5. ***Data:*** For example, store the vulnerability data in an Excel spreadsheet using a different sheet for each construction type.
6. ***Human Resources:*** For example, task individuals for the six-month coding of the windfield simulation. Ask others to design the user-interface by working with the Quality Assurance team.
7. ***Security:*** For example, store tapes off-site, with incremental daily backups. Password-protect all source files.
8. ***Quality Assurance:*** For example, filter insurance company data against norms and extremes created for the last project.

Relevant Form: G-6, Computer Standards Expert Certification

Disclosure

1. Provide a description of the documentation for interface, human factors, functionality, documentation, data, human and material resources, security, and quality assurance.

Audit

1. Provide confirmation that a complete set of requirements for each software component, as well as for each database or data file accessed by a component, has been maintained and documented.

C-3 Model Architecture and Component Design*

(*Significant Revision)

The modeling organization shall maintain and document (1) detailed control and data flow diagrams and interface specifications for each software component, (2) schema definitions for each database and data file, and (3) diagrams illustrating model-related flow of information and its processing by modeling organization personnel or team. Documentation shall be to the level of components that make significant contributions to the model output.

Purpose: Component-based design is essential in creating software that reduces errors and promotes comprehension of the role for each component. Moreover, the component network needs to be shown to operate “as a whole.” Example components include HURRICANES, WINDFIELD, DAMAGE, and LOSS COSTS, and the major components of each. The purpose of each example component is, as follows:

1. HURRICANES accepts historical hurricane sets and generates historical and stochastic storm trajectories;
2. WINDFIELD accepts the output from HURRICANES and produces site-specific winds;
3. DAMAGE accepts the output from WINDFIELD and generates damage to building;
4. LOSS COSTS accepts the output from DAMAGE and generates loss costs.

Relevant Form: G-6, Computer Standards Expert Certification

Audit

1. The following will be reviewed:
 - a. Detailed control and data flow diagrams, completely and sufficiently labeled for each component,
 - b. Interface specifications for all components in the model,
 - c. Documentation for schemas for all data files, along with field type definitions,
 - d. Each network diagram including components, sub-component diagrams, arcs, and labels, and
 - e. Diagrams illustrating model-related information flow among modeling organization personnel or team (e.g., using Unified Modeling Language (UML), Business Process Model and Notation (BPMN), or equivalent technique including a modeling organization internal standard).

2. A model component custodian, or designated proxy, shall be available for the review of each component.

C-4 Implementation

- A. The modeling organization shall maintain a complete procedure of coding guidelines consistent with accepted software engineering practices.**
- B. The modeling organization shall maintain a complete procedure used in creating, deriving, or procuring and verifying databases or data files accessed by components.**
- C. All components shall be traceable, through explicit component identification in the flow diagrams, down to the code level.**
- D. The modeling organization shall maintain a table of all software components affecting loss costs, with the following table columns: (1) Component name, (2) Number of lines of code, minus blank and comment lines; and (3) Number of explanatory comment lines.**
- E. Each component shall be sufficiently and consistently commented so that a software engineer unfamiliar with the code shall be able to comprehend the component logic at a reasonable level of abstraction.**
- F. The modeling organization shall maintain the following documentation for all components or data modified by items identified in Standard G-1 (Scope of the Computer Model and Its Implementation), Disclosure 5:**
 - 1. A list of all equations and formulas used in documentation of the model with definitions of all terms and variables.**
 - 2. A cross-referenced list of implementation source code terms and variable names corresponding to items within F.1.**

Purpose: A high-level graphical view of a program promotes understanding and maintenance. All compositions shall be made clear through explicit textual or interactively supported reference within each graphical component. Each component is refined into subcomponents, and at the end of the component tree there are blocks of code. All documentation and binder identifications shall be referenced within this tree. This creates a traceable design from aggregate components down to the code level.

Relevant Form: G-6, Computer Standards Expert Certification

Disclosure

- 1. Specify the hardware, operating system, other software, and all computer languages required to use the model.

Audit

1. The interfaces and the coupling assumptions will be reviewed.
2. Provide the documented coding guidelines and confirm that these guidelines are uniformly implemented.
3. The procedure used in creating, deriving, or procuring and verifying databases or data files accessed by components will be reviewed.
4. The traceability among components at all levels of representation will be reviewed.
5. The following information shall be available and will be reviewed for each component, either in a header comment block, source control database, or the documentation:
 - a. Component name,
 - b. Date created,
 - c. Dates modified and by whom,
 - d. Purpose or function of the component,
 - e. Input and output parameter definitions.
6. The table of all software components as specified in C-4.D will be reviewed.
7. Model components and the method of mapping to elements in the computer program will be reviewed.
8. Comments within components will be examined for sufficiency, consistency, and explanatory quality.

C-5 Verification*

*(*Significant Revision)*

A. General

For each component, the modeling organization shall maintain procedures for verification, such as code inspections, reviews, calculation crosschecks, and walkthroughs, sufficient to demonstrate code correctness. Verification procedures shall include tests performed by modeling organization personnel other than the original component developers.

B. Component Testing

- 1. The modeling organization shall use testing software to assist in documenting and analyzing all components.***
- 2. Unit tests shall be performed and documented for each component.***
- 3. Regression tests shall be performed and documented on incremental builds.***
- 4. Aggregation tests shall be performed and documented to ensure the correctness of all model components. Sufficient testing shall be performed to ensure that all components have been executed at least once.***

C. Data Testing

- 1. The modeling organization shall use testing software to assist in documenting and analyzing all databases and data files accessed by components.***
- 2. The modeling organization shall perform and document integrity, consistency, and correctness checks on all databases and data files accessed by the components.***

Purpose: Tests shall be run by varying component inputs to ensure correct output. Invariants are one method of achieving verification, where one brackets a block of code to ensure that data values do not stray from their required ranges. Other methods of verification include hand-calculations or parallel coding efforts (using a different language or tool, but with the same requirements).

Relevant Form: G-6, Computer Standards Expert Certification

Disclosures

1. State whether any two executions of the model with no changes in input data, parameters, code, and seeds of random number generators produce the same loss costs and probable maximum loss levels.
2. Provide an overview of the component testing procedures.
3. Provide a description of verification approaches used for externally acquired data, software, and models.

Audit

1. The components will be reviewed for containment of sufficient logical assertions, exception-handling mechanisms, and flag-triggered output statements to test the correct values for key variables that might be subject to modification.
2. The testing software used by the modeling organization will be reviewed.
3. The component (unit, regression, aggregation) and data test processes and documentation will be reviewed including compliance with independence of the verification procedures.
4. Fully time-stamped, documented cross-checking procedures and results for verifying equations, including tester identification, will be reviewed. Examples include mathematical calculations versus source code implementation, or the use of multiple implementations using different languages.
5. Flowcharts defining the processes used for manual and automatic verification will be reviewed.
6. The response to Disclosure 1 will be reviewed.
7. Verification approaches used for externally acquired data, software, and models will be reviewed.

C-6 Model Maintenance and Revision*

*(*Significant Revision)*

- A. The modeling organization shall maintain a clearly written policy for model revision, including verification and validation of revised components, databases, and data files.**
- B. A revision to any portion of the model that results in a change in any Florida residential hurricane loss cost or probable maximum loss level shall result in a new model version identification.**
- C. The modeling organization shall use tracking software to identify and describe all errors, as well as modifications to code, data, and documentation.**
- D. The modeling organization shall maintain a list of all model versions since the initial submission for this year. Each model description shall have a unique version identification, and a list of additions, deletions, and changes that define that version.**

Purpose: The Commission will determine to be acceptable only those models for which the owners have a clearly written policy for model revision with respect to methodologies and data.

Once the software is constructed, it is essential to track and maintain all source code, data, and documentation through a unique version identification system.

Relevant Form: G-6, Computer Standards Expert Certification

Disclosures

1. Identify procedures used to maintain code, data, and documentation.
2. Describe the rules underlying the model and code revision identification systems.

Audit

1. All policies and procedures used to maintain the code, data, and documentation will be reviewed. For each component in the system decomposition, provide the installation date under configuration control, the current version identification, and the date of the most recent change(s).
2. The policy for model revision will be reviewed.

3. The tracking software will be reviewed and checked for the ability to track date and time.
4. The list of all model revisions as specified in C-6.D will be reviewed.

C-7 Security

The modeling organization shall have implemented and fully documented security procedures for: (1) secure access to individual computers where the software components or data can be created or modified, (2) secure operation of the model by clients, if relevant, to ensure that the correct software operation cannot be compromised, (3) anti-virus software installation for all machines where all components and data are being accessed, and (4) secure access to documentation, software, and data in the event of a catastrophe.

Purpose: Security procedures are necessary to maintain an adequate, secure, and correct base for code, data, and documentation. The modeling organization is expected to have a secure location supporting all code, data, and documentation development and maintenance. Necessary measures include, but are not limited to, (1) virus protection, (2) limited access protocols for software, hardware, and networks, and (3) backup and redundancy procedures.

Relevant Form: G-6, Computer Standards Expert Certification

Disclosure

1. Describe methods used to ensure the security and integrity of the code, data, and documentation.

Audit

1. The written policy for all procedures and methods used to ensure the security of code, data, and documentation will be reviewed. Specify all security procedures.
2. Documented security procedures for access, client model use, anti-virus software installation, and off-site procedures in the event of a catastrophe will be reviewed.

**WORKING DEFINITIONS
OF TERMS USED IN THE
*REPORT OF ACTIVITIES***

Working Definitions of Terms Used in the *Report of Activities*

(These terms are meant to be specific to the *Report of Activities*)

Actual Cash Value (ACV):

Cost of replacing damaged or destroyed property with comparable new property minus depreciation.

Actuary:

A highly specialized professional with mathematical and statistical sophistication trained in the risk aspects of insurance, whose functions include the calculations involved in determining proper insurance rates, evaluating reserves, and various aspects of insurance research; a member of the Casualty Actuarial Society.

Acyclic Graph:

A graph containing no cycles.

Additional Living Expense (ALE):

If a home becomes uninhabitable due to a covered loss, ALE coverage pays for the extra costs of housing, dining expenses, etc. up to the limits for ALE in the policy.

Aggregated Data:

Summarized data sets or data summarized by using different variables. For example, data summarizing the exposure amounts by line of business by ZIP Code is one set of aggregated data.

Aggregation Test:

A test to ensure the correctness of all components when operating as a whole.

Annual Aggregate Loss Distributions:

For the Commission's purposes, the aggregate losses which are expected to occur for all hurricane events in any one year. Another way to state it is the aggregate probable maximum loss. See below for Probable Maximum Loss (PML).

Appurtenant Structures:

Coverage for detached buildings and other structures located on the same property as the principal insured building, e.g., detached garage, fences, swimming pools, patios, etc.

Assertion:

A logical expression specifying a program state that must exist or a set of conditions that program variables must satisfy at a particular point during program execution. Types include input assertion, loop assertion, output assertion. Assertions may be handled specifically by the programming language (i.e., with an "assert" statement) or through a condition (i.e., "if") statement.

Atlantic Basin:

The area including the entire North Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico.

Average:

Arithmetic average or arithmetic mean.

Average Annual Loss:

The long term loss expected in any one year.

Base Hurricane Storm Set:

The storm set used to calibrate and validate modeled hurricane frequency impacting Florida against historical hurricanes as defined in Standard M-1 (Base Hurricane Storm Set).

Bathymetry:

Spatial variation of ocean depth relative to mean sea level.

By-Passing Hurricane:

A hurricane which does not make landfall, but still causes damage in Florida.

Calibration:

Process of adjusting values of model input parameters in an attempt to fit appropriate target data sets.

Catastrophe:

A natural or man-made event that causes more than \$25 million in insured losses as defined by Property Claims Services.

Center:

The point inside the eye of a hurricane where the wind is calm and about which the vortex winds rotate.

Code:

In software engineering, computer instructions and data definitions expressed in a programming language or in a form output by an assembler, compiler, or other translator.
Synonym: Program.

Code Refactoring:

Reviewing computer source code to improve nonfunctional attributes of the software through a continuous and sustained code improvement effort. Refactoring involves methods to reduce code complexity, improve readability and extensibility, including unit testing.

Coding Guidelines:

Organization, format, and style directives in the development of programs and the associated documentation.

Coinsurance:

A specific provision used in a property insurance policy in which an insurer assumes liability only for a proportion of a loss.

Commercial Residential Property Insurance:

The type of coverage provided by condominium association, cooperative association, apartment building, and similar policies, including covering the common elements of a homeowners' association; see s. 627.4025, F.S.

Component:

One of the parts that make up a system. A component may be subdivided into other components. The terms "module," "component," and "unit" are often used interchangeably or defined to be sub-elements of one another in different ways depending on the context. For non-object oriented software, a component is defined as the main program, a subprogram, or a subroutine. For object-oriented software, a component is defined as a class characterized by its attributes and component methods.

Component Tree:

An acyclic graph depicting the hierarchical decomposition of a software system or model.
See also: System Decomposition.

Components and Cladding:

Elements of the building envelope that do not qualify as part of the main wind-force resisting system.

Computer Model:

A comprehensive set of formal structures used to capture the dynamic behavior of hurricanes, their impacts on residential structures and insured losses, including the associated data. The structures are: (1) defined in one of several forms such as formulas, equations, pseudo-codes, and diagrams; and (2) translated into computer code and data to enable model execution.

Condominium Owners Policy:

The coverage provided to the condominium unit owner in a building against damage to the interior of the unit.

Control Flow:

The sequence in which operations are performed during the execution of a computer program. *Synonym: Flow of Control. Contrast with: Data Flow.*

Control Flow Diagram:

A diagram that depicts the set of all possible sequences in which operations may be performed during the execution of a system or program. Types include box diagram, flowchart, input-process-output chart, state diagram. *Contrast with:* **Data Flow Diagram.**

Conversion Factor:

Either the ratio of the 1-minute 10-meter wind to a reference wind (e.g., another level, gradient wind, or boundary layer depth-average), or a constant used to convert one unit of measure to another (as in 1 knot = 1.15 mph).

Correctness:

(1) The degree to which a system or component is free from faults in its specification, design, and implementation; (2) the degree to which software, documentation, or other items comply with specified requirements.

Current State-of-the-Science:

A technique, methodology, process, or data that clearly advances or improves the science and may or may not be of a proprietary nature. Such advancement or improvement shall be agreed upon and acceptable to the Commission. Includes currently accepted scientific literature.

Currently Accepted Scientific Literature:

Published in a refereed or peer reviewed journal specific to the academic discipline involved and recognized by the academic community as an advancement or significant contribution to the literature which has not been superseded or replaced by more recent literature.

Damage:

The Commission recognizes that the question, “What is the damage to the house?” may be answered in a number of ways. In constructing their models, the modeling organizations assess “losses” in more than one way, depending on the use to which the information is to be put in the model. A structural engineer might determine that a house is 55% damaged and consider it still structurally sound. A claims adjuster might look at the same house and determine that 55% damage translates into a total loss because the house will be uninhabitable for some time, and further, because of a local ordinance relating to damage exceeding 50%, will have to be completely rebuilt according to updated building requirements. Since the Commission is reviewing models for purposes of residential rate filings in Florida, loss costs must be a function of insurance damage rather than engineering damage.

Damage Ratio:

Percentage of a property damaged by an event relative to the total cost to rebuild or replace the property of like kind and quality.

Data Flow:

The sequence in which data transfer, use, and transformation are performed during the execution of a computer program. *Contrast with:* **Control Flow**.

Data Flow Diagram:

A diagram that depicts data sources, data sinks, data storage, and processes performed on data as nodes, a flow of data as links between the nodes. *Contrast with:* **Control Flow Diagram**.

Data Validation:

Techniques to assure the needed accuracy, required consistency, and sufficient completeness of data values used in model development and revision.

Decay Rate:

The rate at which surface windspeeds decrease and central pressure increases in a tropical cyclone. Tropical cyclones weaken or decay as central pressure rises. Once tropical cyclones move over land, their rate of decay is affected not only because of the removal of their warm water energy source, but also because of surface roughness. The surface roughness contribution to filling is expected to vary spatially. *See also:* **Weakening**.

Demand Surge:

A sudden and generally temporary increase in the cost of claims due to amplified payments following a hurricane or a series of hurricane events.

Depreciation:

The decrease in the value of property over time.

Economic Inflation:

With regards to insurance, the trended long-term increase in the costs of coverages brought about by the increase in costs for the materials and services.

Event:

For purposes of modeling hurricane losses, an event is any hurricane that makes landfall in Florida as a hurricane or by-passes Florida as a hurricane but comes close enough to cause damaging winds in Florida.

Exception:

A state or condition that either prevents the continuation of program execution or initiates, on its detection, a pre-defined response through the provision of exception-handling capabilities.

Exposure:

The unit of measure of the amount of risk assumed. Rates and loss costs are expressed as dollars per exposure. Sometimes the number of houses is used in homeowner's insurance as a loose equivalent.

Far-Field Pressure:

Baseline pressure in the cyclone environment that may be used to relate maximum wind to minimum central pressure.

Filling Rate:

Synonym: Decay Rate.

Flag-Triggered Output Statements:

Statements that cause intermediate results (output) to be produced based on a Boolean-valued flag. This is a common technique for program testing.

Flow Chart:

A control flow diagram in which suitably annotated geometrical figures are used to represent operations, data, or equipment, and arrows are used to indicate the sequential flow from one to another.

Flow Diagram:

See: Control Flow Diagram and Data Flow Diagram.

Forward Speed:

The forward speed at which a tropical cyclone is moving along the earth's surface. This is not the speed at which winds are circulating around the tropical cyclone. A forward speed of 3 mph is slow; a forward speed of 10-15 mph is average; a forward speed of 20-30 mph is fast.

Frequency Distribution:

Division of a sample of observations into a number of classes together with the number of observations in each class.

Function:

(1) In programming languages, a subprogram, usually with formal parameters, that produces a data value that it returns to the place of the invocation. A function may also produce other changes through the use of parameters. (2) A specific purpose of an entity, or its characteristic action.

Functionality:

The degree to which the intended function of an entity is realized. *See also: Function.*

Fundamental Engineering Principles:

The basic engineering tools, physical laws, rules, or assumptions from which other engineering tools can be derived.

Geocoding:

Assignment of a location to geographic coordinates.

Geographic Location Data:

Information related to the geocoding process within the model software.

Ground Up Loss:

Loss to a structure or location prior to the application of a deductible, policy limit, coinsurance penalty, depreciation, exclusion or other policy provision.

Guaranteed Replacement Cost:

A policy provision in which the insurer agrees to pay losses on a replacement cost basis even if in excess of the policy limit.

Gust Factor:

Ratio of the strongest windspeed within a specified interval of time (such as 3-second or 10-second) to the mean windspeed.

Homeowner's Policy:

A package policy for the homeowner that typically combines protection on the structure and contents, additional living expense protection, and personal liability insurance. Homeowner's policies were first developed in the 1950's. Prior to that time, homeowners wishing coverage for fire, theft, and liability had to purchase three separate policies. Homeowner's policies do not cover earthquake or flood. These are sold separately.

Human Factors:

Study of the interrelationships between humans, the tools they use, and the environment in which they live and work. *See also: User Interface.*

Hurricane:

A tropical cyclone in which the maximum one-minute average windspeed at 10-meters height is 74 miles per hour or greater.

Hurricane Characteristic:

An output of the model. Examples are modeled windspeed at a particular location, track, and intensity variation.

Hurricane Parameter:

An input (generally stochastic) to the model. Examples are radius of maximum wind, maximum wind, profile factor, and instantaneous speed and direction of motion.

Implementation:

The process of transforming a design specification into a system realization with components in hardware, software and "humanware." *See also: Code.*

Incremental Build:

A system development strategy that begins with a subset of required capabilities and progressively adds functionality through a cyclical build and test approach.

Independent:

An independent characteristic or event is one which is unaffected by the existence of another characteristic or by whether or not another event occurs.

Insurance Policy:

A contractual document which defines the amount and scope of insurance provided by the insurer resulting in a transfer of risk.

Insurance to Value:

The relationship of the amount of insurance to replacement cost. 100% insurance to value means that the amount of insurance equals the replacement cost.

Insured Loss:

The cost to repair/restore property after an insured event, including ALE, payable by the insurance company after the application of policy terms and limits.

Intensity:

The maximum one-minute sustained surface (i.e., 10-meter) winds measured near the center of a tropical storm.

Interface Specification:

An unambiguous and complete description of the meaning, type, and format of data exchanges among system components (software, hardware, and “humanware”). *See also:* **User Interface.**

Invariant:

A logical expression that remains true within the context of a code segment.

Isotach:

A line of constant windspeed.

Landfall:

A landfall has occurred when the center of hurricane circulation crosses the coastline from sea to land.

Landfall Frequency Distribution:

Frequency distribution of hurricanes whose centers have crossed the coastline from water (Atlantic Ocean or Gulf of Mexico) to land. For hurricane paths that, for example, roughly parallel the coastline with multiple crossings, a single count of the initial crossing should be used in the frequency distribution.

Loss Adjustment Expenses (LAE):

The expenses incurred by an insurer to adjust a claim by a policyholder. These expenses are divided into allocated loss adjustment expenses (ALAE) and unallocated loss adjustment expenses (ULAE). Allocated loss adjustment expenses are specific amounts

attributable to individual claims such as attorney's fees and court costs. Unallocated loss adjustment expenses are all other types of LAE.

Loss Costs:

The portion of the insurance premium applicable to the payment of insured losses only, exclusive of insurance company expenses and profits, per unit of insured exposure. Loss costs shall be stated per thousand dollars.

Loss Exceedance Estimate:

The loss amount which would be exceeded at a given level of probability based on a specific exposure data set.

Mapping of ZIP Codes:

Either a point estimate or a physical geographic area.

Maximum Windspeed:

The peak one-minute, 10-meter winds in a hurricane. Depending on context, maximum windspeed may also refer to the strongest gradient wind.

Mean Windspeed:

The time average surface (10-meter) windspeed at a location. The averaging period shall not be less than one-minute.

MEOW:

Acronym for Maximum Envelope of Water. MEOW can be calculated using the SLOSH model (defined below) to define the expected maximum storm surge at a given location for a given storm. The Maximum of MEOW (MOM) is used to define evacuation zones in Florida.

Miles Per Hour (mph):

Miles per hour. Standard unit of windspeed measurement.

Millibar (mb):

Unit of air pressure. *See also:* **Minimum Central Pressure.**

Minimum Central Pressure:

The minimum surface pressure at the center of a tropical cyclone. The atmosphere exerts a pressure force measured in millibars. Average sea level pressure is 1013.25 millibars. Tropical cyclones have low pressure at the center of the cyclone. For a tropical cyclone of a given radius, lower central pressure corresponds to stronger surface windspeeds and storm surge height. The lowest pressure ever measured in a hurricane in the Atlantic basin was 882 mb in Hurricane Wilma (2005).

Mitigation Measure:

A factor or function that improves a structure's wind resistance.

Model:

See: Computer Model.

Model Architecture:

The structure of components in a program/system, their interrelationships, and the principles and guidelines governing their design and evolution over time.

Model Component Custodian:

The individual who can explain the functional behavior of the component and is responsible for changes (revisions in code, documentation, or data) to that component.

Model Revision:

The process of changing a model to correct discovered faults, add functional capability, respond to technology advances, or prevent invalid results or unwarranted uses. *See also: Regression Testing.*

Model Validation:

A comparison between model behavior and empirical (i.e., physical) behavior.

Model Verification:

Assuring that the series of transformations, initiating with requirements and concluding with an implementation, follow the prescribed software development process.

Modification Factor:

A scalar adjustment to a vulnerability function that may increase or decrease the amount of change.

Modification Function:

Adjusts a vulnerability function and may vary over its range.

Network Diagram:

See: Flow Diagram.

NOAA:

Acronym for the National Oceanic and Atmospheric Administration.

NWS:

Acronym for the National Weather Service, a division of NOAA.

Peak Gust:

Highest surface (i.e., 10-meter) wind recorded. Generally in a 2- to 3-second interval.

Peak Hurricane Intensity:

The peak intensity over the lifetime of a hurricane estimated as the maximum one-minute sustained surface (i.e., 10-meter) winds near the center of the hurricane. *See also: Intensity.*

Personal Residential Property Insurance:

The type of coverage provided by homeowner's, mobile home owner's, dwelling, tenant's, condominium unit owner's, cooperative unit owner's, and similar policies; see s. 627.4025, F.S.

Position:

The position of a hurricane is the latitude and longitude of its center.

Premium:

The consideration paid or to be paid to an insurer for the issuance and delivery of any binder or policy of insurance; see s. 626.014(2), F.S. Premium is the amount charged to the policyholder and includes all taxes and commissions.

Probable Maximum Loss (PML):

Given an annual probability, the aggregate loss that is likely to be exceeded on a particular portfolio of residential exposures in Florida.

Profile Factor:

A hurricane parameter input to the model that controls the radial structure of the cyclone winds independently of Rmax and Vmax.

Program:

See: Code.

Property Insurance:

Insurance on real or personal property of every kind, whether the property is located on land, on water, or in the air, against loss or damage from any and all perils (hazards or causes); see s. 624.604, F.S.

Quality Assurance:

The responsibility and consequent procedures for achieving the targeted levels of quality in the model and the continual improvement of the model development process.

Radius of Maximum Winds (Rmax):

Distance from the center of a hurricane to the strongest winds.

Rate:

The amount by which the exposure is multiplied to determine the premium; see s. 627.041(1), F.S. Rate times exposure equals premium.

Recurvature:

A change in the track of a storm that causes the storm to move continuously from west to east (rather than from east to west as in the tropics), usually also increasing in forward speed. Recurvature happens when the storm moves into the subtropical westerlies.

Regression Test:

A procedure that attempts to identify new faults that might be introduced in the changes to remove existing deficiencies (correct faults, add functionality, or prevent user errors). A regression test is a test applied to a new version or release to verify that it performs the intended functions without introducing new faults or deficiencies. This procedure is not to be confused with ordinary least squares as used in statistics. *See also:* **Model Revision**.

Reinsurance:

An arrangement by which one insurer (the ceding insurer) transfers all or a portion of its risk under a policy or group of policies to another insurer (the reinsurer). Thus reinsurance is insurance purchased by an insurance company from another insurer, to reduce risk for the ceding insurer.

Replacement Cost:

The cost to replace damaged property with a new item of like kind and quality.

Residential Property Insurance:

See s. 627.4025, F.S. *See also:* **Commercial Residential Property Insurance** and **Personal Residential Property Insurance**.

Requirements Specification:

A document that specifies the requirements for a system or component. Typically included are functional requirements, performance requirements, interface requirements, design requirements, quality requirements, and development standards.

Return Period:

The reciprocal of an annual exceedance probability of a given loss or set of events.

Roughness:

Surface characteristics capable of disrupting airflow. Roughness elements may be natural (e.g., mountains, trees, grasslands) or man-made (e.g., buildings, bridges).

Saffir-Simpson Scale:

A scale ranging from one to five based on the hurricane's present intensity. This scale can be used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane. In practice, windspeed is the parameter that determines category since storm surge is strongly dependent on the slope of the continental shelf. *Reference:* Saffir-Simpson Scale provided in Standard M-3 (Hurricane Probabilities).

Schema:

(1) A complete description of the structure of a database pertaining to a specific level of consideration; (2) The set of statements, expressed in a data definition language, that completely describes the structure of a database.

Sensitivity:

The effect that a change in the value of an input variable will have on the output of the model.

Sensitivity Analysis:

Determination of the magnitude of the change in response of a model to changes in model inputs and specifications.

Significant Change:

Those changes to the standards or any changes to the model that result in changes to loss costs or probable maximum loss levels, or have potential for changes to the loss costs or probable maximum loss levels. The Commission shall determine whether a change is significant.

SLOSH:

Acronym for Sea, Lake and Overland Surges from Hurricanes. SLOSH is a NWS computer model developed to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes by taking into account the atmospheric pressure (difference between central pressure and ambient pressure far from the storm), radius of maximum winds, and track data (forward speed and direction).

Software Engineering:

The application of a systematic, disciplined, and quantifiable approach to the design, development, operation, and maintenance of software; that is, the application of engineering to software.

Statistical Terms:

Definitions of statistical terms are available in: [A Dictionary of Statistical Terms, Fifth Edition, F.H.C. Marriott, John Wiley & Sons, 1990.](#)

Storm Heading:

The direction towards which a storm is moving. Angle is measured clockwise from north (0°) so that east is 90°, etc.

Storm Surge:

An abnormal rise in sea level accompanying a hurricane, and whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the hurricane. Storm surge is usually estimated by subtracting the normal or astronomical tide from the observed storm tide.

Storm Track:

The path along that a tropical cyclone has already moved.

Sub-Component:

A component that is encapsulated within another component. *See also:* **Component Tree.**

System Decomposition:

The hierarchical division of a system into components. *See also:* **Component Tree.**

Terrain:

Terrain or terrain roughness for structures or a site is determined by the surface area surrounding the site including other structures (height and density) and topographic features such as ground elevation, vegetation or trees, and bodies of water.

Test:

A phase in the software (model) development process that focuses on the examination and dynamic analysis of execution behavior. Test plans, test specifications, test procedures, and test results are the artifacts typically produced in completing this phase.

Testing:

Software testing involves executing an implementation of the software with test data and examining the outputs of the software and its operational behavior to check that it is performing as required. Testing is a dynamic technique of verification and validation because it works with an executable representation of the system. Typical testing approaches include (1) unit, (2) aggregation, (3) regression, and (4) functional testing.

Time Element Coverage:

Insurance for a covered incident resulting in loss of use of property for a period of time. The loss is considered to be time lost, not actual property damage. Examples of time element coverage are business interruption, extra expense, rents and rental value, additional living expenses, and leasehold interest coverage.

Tropical Cyclone:

A generic term for a non-frontal synoptic-scale cyclone originating over tropical or subtropical waters with organized convection and definite cyclonic surface wind circulation.

Tropical Storm:

A tropical cyclone in which the maximum one-minute average windspeed at 10-meters height ranges from 39 to 73 miles per hour inclusive.

Uncertainty Analysis:

Determination of the variation or imprecision in model output resulting from the collective variation in the model inputs.

Underwriting:

The process of identifying and classifying the potential degree of risk represented by a proposed exposure unit. Potential insureds that satisfy an insurer's underwriting standards are offered insurance or are offered a renewal while others are declined or non-renewed.

Unit:

Synonym: **Component.**

Unit Test:

Each component is tested on its own, isolated from the other components in the system.

User:

A person who uses a computer to execute code, to provide the code with input through a user interface, or to obtain textual or visual output.

User Documentation:

Documentation describing a way in which a system or component is to be used to obtain desired results. *See also:* **User Manual.**

User Interface:

An interface that enables information to be passed between a human user and hardware or software components of a computer system. *See also:* **Interface Specification.**

User Manual:

A document that presents the information necessary to employ a system or component to obtain desired results. Typically described are system or component capabilities, limitations, options, permitted inputs, expected outputs, possible error messages, and special instructions.

Vmax (or maximum wind):

The peak one-minute, 10-meter winds in a hurricane. Depending upon the context, Vmax may also refer to the strongest gradient wind.

Validation:

The process of determining the degree to which a model or simulation is an accurate representation of the real-world from the perspective of the intended uses of the model or simulation.

Verification:

The process of determining that a model representation accurately represents the developer's conceptual description, specification, and requirements. Verification also evaluates the extent to which the model development process is based on sound and established software engineering techniques. Testing, inspections, reviews, calculation crosschecks and walkthroughs, applied to design and code, are examples of verification techniques. *See also:* **Walkthrough.**

Version:

(1) An initial release or re-release of a computer software configuration item, associated with a complete compilation or recompilation of the computer software configuration item; (2) An initial release or complete re-release of a document, as opposed to a revision resulting from issuing change pages to a previous release; (3) An initial release or re-release of a database or file.

Vertical Wind Profile:

The continuous variation of hurricane windspeed with height.

Visualization:

A two or three-dimensional graphical display, chart, or plot meant to augment or replace a numerical table.

Vortex:

The circularly symmetric rotating wind and pressure fields of the hurricane.

Vulnerability Assessment:

A determination as to how likely a particular insured structure is to be damaged by a hurricane and an estimate of the loss potential.

Vulnerability Functions:

The curve that represents the damage ratios expected at various windspeeds for a given structural type.

Walkthrough:

A static analysis technique in which a designer or programmer leads members of the development team and other interested parties through a segment of the documentation or code, and the participants ask questions and make comments about possible errors, violation of development standards, and other problems.

Weakening:

A reduction in the maximum one-minute sustained 10-meter winds. *See also:* **Decay Rate.**

Windfield:

The area of winds associated with a tropical cyclone. Winds are typically asymmetric in a moving tropical cyclone with winds in the right front quadrant, relative to motion, being strongest.

ZIP Code Centroid: Two types of centroids:

Geographic Centroid:

The geographic center of a ZIP Code.

Population Weighted Centroid:

The center determined by weighting the distribution of population over the ZIP Code.

REFERENCES

REFERENCES

For the purposes of the standards, disclosures, and forms for model specification adopted in this document, the following references or published data sets are listed. Subsequent revisions to these documents and data sets shall supersede the versions listed below.

1. **1994 South Florida Building Code**
2. **A Dictionary of Statistical Terms**, Fifth Edition, F.H.C. Marriott, John Wiley & Sons, 1990.
3. **Florida Building Code** (available at www.floridabuilding.org/c/default.aspx).
4. **Florida Statutes** (available at www.flsenate.gov/statutes/).
5. Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., “*Completion of the 2006 National Land Cover Database for the Conterminous United States*,” **PE&RS**, Vol. 77(9), 858-864, 2011.
6. **Hurricane Best Track Files (HURDAT2), Atlantic Tracks File** (available at www.nhc.noaa.gov/data/#hurdat).
7. Iman, Ronald L., Johnson, Mark E., and Schroeder, Tom A., “*Assessing Hurricane Effects. Part I. Sensitivity Analysis*,” **Reliability Engineering & System Safety**, Vol. 78, 131-145, 2002.
8. Iman, Ronald L., Johnson, Mark E., and Schroeder, Tom A., “*Assessing Hurricane Effects. Part 2. Uncertainty Analysis*,” **Reliability Engineering & System Safety**, Vol. 78, 147-155, 2002.
9. Iman, Ronald L., “*Latin Hypercube Sampling*,” **Encyclopedia of Statistical Sciences**, Update Volume 3, 1999.
10. Iman, Ronald L., Johnson, Mark E., and Schroeder, Tom A., “*Professional Team Demonstration Uncertainty/Sensitivity Analysis*” (available at www.sbafla.com/method/portals/methodology/CommissionInquiries/UA-SA%20Demo.pdf).
11. Jelesnianski, C.P., Chen, J., and Shaffer, W.A., 1992: SLOSH: Sea, lake and overland surges from hurricanes. NOAA Technical Report NWS 48, National Oceanic and Atmospheric Administration, 71pp (available at <http://slosh.nws.noaa.gov/sloshPub/>).
12. McAdie, C.J., Landsea, C.W., Neumann, C.J., David, J.E., Blake, E.S., and Hammer, G.R., “*Tropical Cyclones of the North Atlantic Ocean, 1871-2006*,” NOAA National Climatic Data Center (NCDC) Historical Climatology Series 6-2, 6th revision, 237pp, 2009 (available at www.nhc.noaa.gov/pdf/TCBookAt1851-2006lowres.pdf).

13. Neumann, C.J., Jarvinen, B.R., McAdie, C.J., and Hammer, G.R., "*Tropical Cyclones of the North Atlantic Ocean, 1871-1998*," NOAA National Climatic Data Center (NCDC) Historical Climatology Series 6-2, 5th revision, 211pp, 1999.
14. NWS, 2013: SLOSH. Accessed June 2013 from www.nhc.noaa.gov/surge/slosh.php.
15. **The National Land Cover Database** (available from the Multi-Resolution Land Characteristics (MRLC) Consortium at www.mrlc.gov).

VIII. INQUIRIES OR INVESTIGATIONS

INQUIRIES OR INVESTIGATIONS

The Commission finds that since its activities are ongoing, it is appropriate to set out, as it did at the end of its previous year of inquiry and investigation, a list of matters which the Commission determines are subjects for further inquiry and investigation. This list is not intended to be all-inclusive. The Commission anticipates that other matters will be added as they are identified. The Commission also notes that these matters as set out below imply no particular order of importance and no particular order regarding timing.

Inquiries or investigations will be reported on by the Professional Team prior to the Committee meetings.

Mitigation Impact

(Note: Report was provided to the Commission July 2013, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/20130710_InquiriesReport.pdf.)

Development of new forms to examine the impact of mitigation schemes, individually and in combination, on the mean damage ratio for a portfolio similar to the one used in Form V-1 (One Hypothetical Event) for frame and masonry constructions.

Development of actuarial form similar to Form V-3 (Mitigation Measures – Mean Damage Ratios and Loss Costs, Trade Secret item) providing loss costs rather than mean damage ratio.

Software Engineering

(Note: Report was provided to the Commission July 2013, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/20130710_InquiriesReport.pdf.)

Determine the software engineering techniques, such as code refactoring, used by the modeling organizations to improve the readability, efficiency, maintainability, and structure of software without changing its functionality.

Specific or Unique Modeling Issues

(Note: Report was provided to the Commission July 2013, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/20130710_InquiriesReport.pdf.)

Anomalies related to specific counties or unique circumstances that may impact modeling results shall be identified, and these issues shall be evaluated and discussed by the Commission.

Storm Surge

(Note: Reports were provided to the Commission July 2009, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/200907_InquiriesReportJuly2009.pdf and July 2013, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/20130710_InquiriesReport.pdf.)

How are modeling organizations modeling storm surge?

The Professional Team is requested to explore with each modeling organization the following during the on-site reviews under the 2013 standards:

- Storm surge calculation
- Underlying formulation of the storm surge calculation (e.g., dynamical or statistical, underlying equations or functional/distributional form), including whether it includes wave action
- Source and resolution of the bathymetry and coastal topography used in the storm surge calculation at the risk location level
- Hurricane parameters and characteristics used in the storm surge calculation
- Inputs used in the storm surge calculation that have not already been described
- Storm surge initialization in an individual storm surge calculation
- Storm surge development related to storm track out to sea
- Comparison of the storm surge calculated in the model with historical storm surge (e.g., five locations from a different coastal county)
- Comparison of storm surge calculated in the model worst case for the same five locations compared with other data sets or models
- Model capability to determine losses due to storm surge explicitly
- Development of the building vulnerability functions for storm surge.

Vulnerability Model Development for Mitigation Features

(Note: Report was provided to the Commission July 2013, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/20130710_InquiriesReport.pdf.)

Explore the use of a physical/engineering based approach to vulnerability model development for application of mitigation features.

Previous Inquiries or Investigations

Acceptability Process and Standards for Future Consideration

(Note: Report was provided to the Commission July 2009, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/200907_InquiriesReportJuly2009.pdf.)

The Commission incorporated in the *Report of Activities as of November 1, 2008*, a section entitled “*Acceptability Process and Standards for Future Consideration*.” The section contained potential new standards, public disclosures, audit requirements, and procedures that were discussed during the Committee meetings on August 12 & 13, 2008. The Commission sought public comments on the contents of the section in order to fully understand the implications of the various proposed changes.

The Commission incorporated the potential new standards, public disclosures, audit requirements, and procedures deemed appropriate in the *Report of Activities as of November 1, 2009*.

Adverse Loss Development

(Note: Report was provided to the Commission July 2013, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/20130710_InquiriesReport.pdf.)

Is the impact of reopened claims evident in the claims data provided to the modeling organizations for validation of the loss projections generated by the model? Should the impact of adverse loss development be incorporated in the model loss results, and if so, how? Should adverse loss development be a consideration to be incorporated into the standards or as a separate standard?

The Commission determined that adverse loss development should not be incorporated into existing or new standards.

ALE/Storm Surge/Infrastructure

(Note: Report was provided to the Commission July 2005, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2005.pdf.)

The Commission has studied how ALE claim payments are affected by storm surge damage to the infrastructure.

The Commission determined that ALE loss costs produced by a model should appropriately consider ALE claims as a result of damage to the infrastructure.

Commercial Residential Property

(Note: Reports were provided to the Commission July 2002, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/200207commercialresidential.pdf; July 2005, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2005.pdf; July 2006, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2006.pdf; and July 2009, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/200907_InquiriesReportJuly2009.pdf.)

The Commission has studied commercial residential to determine (1) if the Commission should expand its scope to include commercial residential property in the modeling process, (2) if sufficient data are available for validation purposes, (3) if the acceptability process would include personal residential and commercial residential as a whole or separately, (4) what changes would be involved in the meteorology and vulnerability standards, and (5) if separate standards should be created for commercial residential.

The Commission determined that after the 2004 and 2005 hurricane seasons there is information on which reasonable commercial residential loss costs can be modeled and validated, and that commercial residential standards will be adopted.

Demand Surge

(Note: Report was provided to the Commission July 2003, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/ProTeamWhitePaper.pdf.)

The Commission has studied demand surge to determine (1) if there is information on which reasonable demand surge estimations can be made, (2) how demand surge is incorporated in model calculations, (3) what the scientific basis is for those calculations, and (4) whether it is appropriate for demand surge to be included or excluded.

The Commission determined that after the 2004 and 2005 hurricane seasons there is sufficient information on which reasonable demand surge estimations can be made and to incorporate demand surge into the standards.

HURDAT Data Revisions

(Note: Reports were provided to the Commission July 2003, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/ProTeamWhitePaper.pdf and July 2005, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2005.pdf.)

The Commission has assessed adopting HURDAT as the Base Hurricane Storm Set and determined that all models should be based upon the complete HURDAT with the June 1, 2008 release.

The Commission provided a multiple-year buffer for the transition between the existing Base Hurricane Storm Set and the complete North Atlantic HURDAT.

Hurricane Force Winds

(Note: Reports were provided to the Commission July 2005, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2005.pdf and July 2006, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2006.pdf.)

The Commission has assessed the extent to which modeled hurricanes match the observed radius of hurricane force winds.

The Commission recognizes the importance of the spatial distribution of winds, but is sensitive to the inadequacies associated with radius of hurricane force winds data.

Hurricane Season Impact

(Note: Report was provided to the Commission July 2006, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2006.pdf.)

The Commission has assessed if any potential bias is entered into the model results by the inclusion or exclusion of a year's hurricane season, whether the season be active or inactive.

The Commission determined it is prudent to maintain the requirement to update the hurricane frequency annually to reduce any potential bias entered in the model results by the inclusion or exclusion of a year's hurricane season.

Impact on Modeling Organizations

(Note: Report was provided to the Commission July 2003, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/ProTeamWhitePaper.pdf.)

The Commission has investigated the cost factor involved with meeting the standards and the acceptability process, the impact changes have on this cost, and ideas for cutting the cost to modeling organizations.

The Commission considers the costs and benefits associated with the review process and continually monitors its impact on modeling organizations.

Interactions of Hurricanes

(Note: Report was provided to the Commission July 2005, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2005.pdf.)

The Commission has investigated the assumptions used by the models regarding whether the damage caused by multiple hurricanes impacting the same exposure during a season is independent and how it impacts loss costs.

The Commission determined that models should calculate deductible loss costs on an annual deductible basis.

Multi-Decadal Variability and Its Impact on Expected Loss

(Note: Reports were provided to the Commission July 2006, and are available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2006.pdf and www.sbafla.com/method/portals/methodology/CommissionInquiries/MultidecadalReportJuly2006.pdf, and July 2009, available at www.sbafla.com/method/portals/methodology/CommissionInquiries/200907_InquiriesReportJuly2009.pdf.)

A body of literature has accumulated since 1990 that focuses on multi-decadal variability of hurricanes. The hypothesis is that we are in an enhanced period of activity that can be expected to last for a total duration of 20-30 years and then decrease to activity levels like the low frequency and landfall times of the 1980s. The Commission has assessed if the models should take this into account.

The Commission determined that its procedures are sufficient to review a model submitted to account for multi-decadal variability.

Retrofit or Remodeled Structures

(Note: Report was provided to the Commission July 2009, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/200907_InquiriesReportJuly2009.pdf.)

The Commission investigated how retrofit or remodeled buildings are treated in a model and what information is reflected in year built data provided by insurance companies.

The Commission recognizes that the current methods used by models to incorporate year built data is satisfactory and is sensitive to the inadequacies associated with the exposure data.

Risk Location

(Note: Report was provided to the Commission July 2006, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2006.pdf.)

The Commission has investigated the use of latitude/longitude based exposure data sets rather than ZIP Code based where the exposure is placed at the population centroid and how this would impact loss costs.

The Commission determined that ZIP Code based exposure data is appropriate.

Transition of Hurricanes

(Note: Report was provided to the Commission July 2005, and is available at www.sbafla.com/method/portals/methodology/CommissionInquiries/PTIssuesReportJuly2005.pdf.)

The Commission has assessed the need to account for the transition of hurricanes from over-water to over-land using currently acceptable meteorological science.

The Commission determined that the current methods used by models are adequate to capture the transition effects of hurricane weakening and friction and that the models should be validated using published wind observations as substantial data for hurricane windfields over-land are being collected and published in the atmospheric science and engineering literature.

IX. APPENDICES

Florida Statutes, 2013

627.0628 Florida Commission on Hurricane Loss Projection Methodology; public records exemption; public meetings exemption.–

(1) LEGISLATIVE FINDINGS AND INTENT.–

- (a) Reliable projections of hurricane losses are necessary in order to assure that rates for residential property insurance meet the statutory requirement that rates be neither excessive nor inadequate. The ability to accurately project hurricane losses has been enhanced greatly in recent years through the use of computer modeling. It is the public policy of this state to encourage the use of the most sophisticated actuarial methods to assure that consumers are charged lawful rates for residential property insurance coverage.
- (b) The Legislature recognizes the need for expert evaluation of computer models and other recently developed or improved actuarial methodologies for projecting hurricane losses, in order to resolve conflicts among actuarial professionals, and in order to provide both immediate and continuing improvement in the sophistication of actuarial methods used to set rates charged to consumers.
- (c) It is the intent of the Legislature to create the Florida Commission on Hurricane Loss Projection Methodology as a panel of experts to provide the most actuarially sophisticated guidelines and standards for projection of hurricane losses possible, given the current state of actuarial science. It is the further intent of the Legislature that such standards and guidelines must be used by the State Board of Administration in developing reimbursement premium rates for the Florida Hurricane Catastrophe Fund, and, subject to paragraph (3)(d), must be used by insurers in rate filings under s. 627.062 unless the way in which such standards and guidelines were applied by the insurer was erroneous, as shown by a preponderance of the evidence.
- (d) It is the intent of the Legislature that such standards and guidelines be employed as soon as possible, and that they be subject to continuing review thereafter.
- (e) The Legislature finds that the authority to take final agency action with respect to insurance ratemaking is vested in the Office of Insurance Regulation and the Financial Services Commission, and that the processes, standards, and guidelines of the Florida Commission on Hurricane Loss Projection Methodology do not constitute final agency action or statements of general applicability that implement, interpret, or prescribe law or policy; accordingly, chapter 120 does not apply to the processes, standards, and guidelines of the Florida Commission on Hurricane Loss Projection Methodology.

(2) COMMISSION CREATED.–

- (a) There is created the Florida Commission on Hurricane Loss Projection Methodology, which is assigned to the State Board of Administration. For the purposes of this section, the term “commission” means the Florida Commission on Hurricane Loss Projection

Methodology. The commission shall be administratively housed within the State Board of Administration, but it shall independently exercise the powers and duties specified in this section.

- (b) The commission shall consist of the following 12 members:
1. The insurance consumer advocate.
 2. The senior employee of the State Board of Administration responsible for operations of the Florida Hurricane Catastrophe Fund.
 3. The Executive Director of the Citizens Property Insurance Corporation.
 4. The Director of the Division of Emergency Management.
 5. The actuary member of the Florida Hurricane Catastrophe Fund Advisory Council.
 6. An employee of the office who is an actuary responsible for property insurance rate filings and who is appointed by the director of the office.
 7. Five members appointed by the Chief Financial Officer, as follows:
 - a. An actuary who is employed full time by a property and casualty insurer that was responsible for at least 1 percent of the aggregate statewide direct written premium for homeowner's insurance in the calendar year preceding the member's appointment to the commission.
 - b. An expert in insurance finance who is a full-time member of the faculty of the State University System and who has a background in actuarial science.
 - c. An expert in statistics who is a full-time member of the faculty of the State University System and who has a background in insurance.
 - d. An expert in computer system design who is a full-time member of the faculty of the State University System.
 - e. An expert in meteorology who is a full-time member of the faculty of the State University System and who specializes in hurricanes.
 8. A licensed professional structural engineer who is a full-time faculty member in the State University System and who has expertise in wind mitigation techniques. This appointment shall be made by the Governor.
- (c) Members designated under subparagraphs (b)1.-5. shall serve on the commission as long as they maintain the respective offices designated in subparagraphs (b)1.-5. The member appointed by the director of the office under subparagraph (b)6. shall serve on the commission until the end of the term of office of the director who appointed him or her, unless removed earlier by the director for cause. Members appointed by the Chief Financial Officer under subparagraph (b)7. shall serve on the commission until the end of the term of office of the Chief Financial Officer who appointed them, unless earlier removed by the Chief Financial Officer for cause. Vacancies on the commission shall be filled in the same manner as the original appointment.
- (d) The State Board of Administration shall annually appoint one of the members of the commission to serve as chair.
- (e) Members of the commission shall serve without compensation, but shall be reimbursed for per diem and travel expenses pursuant to s. 112.061.
- (f) The State Board of Administration shall, as a cost of administration of the Florida Hurricane Catastrophe Fund, provide for travel, expenses, and staff support for the commission.

- (g) There shall be no liability on the part of, and no cause of action of any nature shall arise against, any member of the commission, any member of the State Board of Administration, or any employee of the State Board of Administration for any action taken in the performance of their duties under this section. In addition, the commission may, in writing, waive any potential cause of action for negligence of a consultant, contractor, or contract employee engaged to assist the commission.

(3) ADOPTION AND EFFECT OF STANDARDS AND GUIDELINES.–

- (a) The commission shall consider any actuarial methods, principles, standards, models, or output ranges that have the potential for improving the accuracy of or reliability of the hurricane loss projections used in residential property insurance rate filings. The commission shall, from time to time, adopt findings as to the accuracy or reliability of particular methods, principles, standards, models, or output ranges.
- (b) The commission shall consider any actuarial methods, principles, standards, or models that have the potential for improving the accuracy of or reliability of projecting probable maximum loss levels. The commission shall adopt findings as to the accuracy or reliability of particular methods, principles, standards, or models related to probable maximum loss calculations.
- (c) In establishing reimbursement premiums for the Florida Hurricane Catastrophe Fund, the State Board of Administration must, to the extent feasible, employ actuarial methods, principles, standards, models, or output ranges found by the commission to be accurate or reliable.
- (d) With respect to a rate filing under s. 627.062, an insurer shall employ and may not modify or adjust actuarial methods, principles, standards, models, or output ranges found by the commission to be accurate or reliable in determining hurricane loss factors for use in a rate filing under s. 627.062. An insurer shall employ and may not modify or adjust models found by the commission to be accurate or reliable in determining probable maximum loss levels pursuant to paragraph (b) with respect to a rate filing under s. 627.062 made more than 60 days after the commission has made such findings.
- (e) The commission shall adopt revisions to previously adopted actuarial methods, principles, standards, models, or output ranges every odd year.
- (f) 1. A trade secret, as defined in s. 688.002, that is used in designing and constructing a hurricane loss model and that is provided pursuant to this section, by a private company, to the commission, office, or consumer advocate appointed pursuant to s. 627.0613, is confidential and exempt from s. 119.07(1) and s. 24(a), Art. 1 of the State Constitution.
 - 2. a. That portion of a meeting of the commission or of a rate proceeding on an insurer's rate filing at which a trade secret made confidential and exempt by this paragraph is discussed is exempt from s. 286.011 and s. 24(b), Art. 1 of the State Constitution. The closed meeting must be recorded, and no portion of the closed meeting may be off the record.

- b. The recording of a closed portion of a meeting is exempt from s. 119.07(1) and s. 24(a), Art. 1 of the State Constitution.
- c. This paragraph is subject to the Open Government Sunset Review Act in accordance with s. 119.15, and shall stand repealed on October 2, 2015, unless reviewed and saved from repeal through reenactment by the Legislature.

History.--s. 6, ch. 95-276; s. 6, ch. 96-194; s. 3, ch. 97-55; s. 4, ch. 2000-333; s. 1066, ch. 2003-261; s. 79, ch. 2004-390; s. 4, ch. 2005-111; s. 3, ch. 2005-264; s. 12, ch. 2006-12; s. 145, ch. 2008-4; s. 11, ch. 2008-66; s. 83, ch. 2009-21; s. 10, ch. 2009-70; s. 16, ch. 2009-87; s. 1, ch. 2010-89; s. 431, ch. 2011-142; s. 76, ch. 2012-5; s. 5, ch. 2013-60.

627.701(5)-(9) Liability of insureds; coinsurance; deductibles. –

- (5)(a) The hurricane deductible of any personal lines residential property insurance policy issued or renewed on or after May 1, 2005, shall be applied as follows:
1. The hurricane deductible shall apply on an annual basis to all covered hurricane losses that occur during the calendar year for losses that are covered under one or more policies issued by the same insurer or an insurer in the same insurer group.
 2. If a hurricane deductible applies separately to each of one or more structures insured under a single policy, the requirements of this paragraph apply with respect to the deductible for each structure.
 3. If there was a hurricane loss for a prior hurricane or hurricanes during the calendar year, the insurer may apply a deductible to a subsequent hurricane which is the greater of the remaining amount of the hurricane deductible or the amount of the deductible that applies to perils other than a hurricane. Insurers may require policyholders to report hurricane losses that are below the hurricane deductible or to maintain receipts or other records of such hurricane losses in order to apply such losses to subsequent hurricane claims.
 4. If there are hurricane losses in a calendar year on more than one policy issued by the same insurer or an insurer in the same insurer group, the hurricane deductible shall be the highest amount stated in any one of the policies. If a policyholder who had a hurricane loss under the prior policy is provided or offered a lower hurricane deductible under the new or renewal policy, the insurer must notify the policyholder, in writing, at the time the lower hurricane deductible is provided or offered, that the lower hurricane deductible will not apply until January 1 of the following calendar year.
- (b) For commercial residential property insurance policies issued or renewed on or after January 1, 2006, the insurer must offer the policyholder the following alternative hurricane deductibles:
1. A hurricane deductible that applies on an annual basis as provided in paragraph (a); and
 2. A hurricane deductible that applies to each hurricane.
- (6) (a) It is the intent of the Legislature to encourage the use of higher hurricane deductibles as a means of increasing the effective capacity of the hurricane insurance market in this state and as a means of limiting the impact of rapidly changing hurricane insurance premiums. The Legislature finds that the hurricane deductibles specified in this subsection are reasonable when a property owner has made adequate provision for restoration of the property to its full value after a catastrophic loss.
- (b) A personal lines residential insurance policy providing hurricane coverage may, at the mutual option of the insured and insurer, include a secured hurricane deductible as described in paragraph (c) if the applicant presents the insurer a certificate of security as described in paragraph (d). An insurer may not directly or indirectly require a secured deductible under this subsection as a condition of issuing or renewing a policy. A certificate of security is not required with respect to an applicant who owns a 100 percent equity interest in the property.

- (c) A secured hurricane deductible must include the substance of the following:
1. The first \$500 of any claim, regardless of the peril causing the loss, is fully deductible.
 2. With respect to hurricane losses only, the next \$5,000 in losses are fully insured, subject only to a copayment requirement of 10 percent.
 3. With respect to hurricane losses only, the remainder of the claim is subject to a deductible equal to a specified percentage of the policy dwelling limits in excess of the deductible allowed under former paragraph (3)(a) but no higher than 10 percent of the policy dwelling limits.
 4. The insurer agrees to renew the coverage on a guaranteed basis for a period of years after initial issuance of the secured deductible equal to at least 1 year for each 2 percentage points of deductible specified in subparagraph 3. unless the policy is canceled for nonpayment of premium or the insured fails to maintain the certificate of security. Such renewal shall be at the same premium as the initial policy except for premium changes attributable to changes in the value of the property.
- (d) The office shall draft and formally propose as a rule the form for the certificate of security. The certificate of security may be issued in any of the following circumstances:
1. A mortgage lender or other financial institution may issue a certificate of security after granting the applicant a line of credit, secured by equity in real property or other reasonable security, which line of credit may be drawn on only to pay for the deductible portion of insured construction or reconstruction after a hurricane loss. In the sole discretion of the mortgage lender or other financial institution, the line of credit may be issued to an applicant on an unsecured basis.
 2. A licensed insurance agent may issue a certificate of security after obtaining for an applicant a line of credit, secured by equity in real property or other reasonable security, which line of credit may be drawn on only to pay for the deductible portion of insured construction or reconstruction after a hurricane loss. The Florida Hurricane Catastrophe Fund shall negotiate agreements creating a financing consortium to serve as an additional source of lines of credit to secure deductibles. Any licensed insurance agent may act as the agent of such consortium.
 3. Any person qualified to act as a trustee for any purpose may issue a certificate of security secured by a pledge of assets, with the restriction that the assets may be drawn on only to pay for the deductible portion of insured construction or reconstruction after a hurricane loss.
 4. Any insurer, including any admitted insurer or any surplus lines insurer, may issue a certificate of security after issuing the applicant a policy of supplemental insurance that will pay for 100 percent of the deductible portion of insured construction or reconstruction after a hurricane loss.
 5. Any other method approved by the office upon finding that such other method provides a similar level of security as the methods specified in this paragraph and that such other method has no negative impact on residential property insurance catastrophic capacity. The legislative intent of this subparagraph is to provide the flexibility needed to achieve the public policy of expanding property insurance capacity while improving the affordability of property insurance.
- (e) An issuer of a certificate of security may terminate the certificate for failure to honor any of the terms of the underlying financial arrangement. The issuer must provide notice of

termination to the insurer within 10 working days after termination. Unless the policyholder obtains a replacement certificate of security within an additional 20 working days after such notice, the deductible provision in the policy must revert to a lower deductible otherwise offered by the insurer and the policyholder is responsible for any additional premium required for a policy with such deductible.

- (7) Prior to issuing a personal lines residential property insurance policy on or after April 1, 1997, or prior to the first renewal of a residential property insurance policy on or after April 1, 1997, the insurer must offer a deductible equal to \$500 applicable to losses from perils other than hurricane. The insurer must provide the policyholder with notice of the availability of the deductible specified in this subsection in a form approved by the office at least once every 3 years. The failure to provide such notice constitutes a violation of this code but does not affect the coverage provided under the policy. An insurer may require a higher deductible only as part of a deductible program lawfully in effect on June 1, 1996, or as part of a similar deductible program.
- (8) Notwithstanding the other provisions of this section or of other law, but only as to hurricane coverage as defined in s. 627.4025 for commercial lines residential coverages, an insurer may offer a deductible in an amount not exceeding 10 percent of the insured value if, at the time of such offer and at each renewal, the insurer also offers to the policyholder a deductible in the amount of 3 percent of the insured value. Nothing in this subsection prohibits any deductible otherwise authorized by this section. All forms by which the offers authorized in this subsection are made or required to be made shall be on forms that are adopted or approved by the commission or office.
- (9) With respect to hurricane coverage provided in a policy of residential coverage, when the policyholder has taken appropriate hurricane mitigation measures regarding the residence covered under the policy, the insurer shall provide the insured the option of selecting an appropriate reduction in the policy's hurricane deductible or selecting the appropriate discount credit or other rate differential as provided in s. 627.0629. The insurer must provide the policyholder with notice of the options available under this subsection on a form approved by the office.

History.—s. 605, ch. 59-205; s. 3, ch. 76-168; s. 1, ch. 77-457; ss. 2, 3, ch. 81-318; ss. 538, 541, 809(2nd), ch. 82-243; s. 79, ch. 82-386; s. 114, ch. 92-318; s. 16, ch. 93-410; s. 13, ch. 95-276; s. 12, ch. 96-194; s. 11, ch. 97-55; s. 26, ch. 97-93; s. 1736, ch. 97-102; s. 1183, ch. 2003-261; s. 4, ch. 2004-480; ss. 12, 13, ch. 2005-111; s. 45, ch. 2006-12; s. 28, ch. 2007-1; s. 17, ch. 2007-90; s. 151, ch. 2008-4.

Meeting Schedule and Topics of Discussion

1995

July 14	Organizational Meeting
August 10	Discussion of the Problem
August 24	Discussion on Mission, Goals, and Objectives
September 7	Meeting with Modeling Organizations
September 21	Development of Work Plan
October 5	Canceled Due to Hurricane Opal
October 19	Development of Descriptive Criteria and Tests of the Model
November 2	The Evaluation Process
November 16	Meeting with Modeling Organizations to provide input for the Evaluation Process
November 30	Adoption of Initial Standards and Guidelines

1996

January 8	Review of Modeling Organization Responses for Modules 1 and 2
January 29	Comparison of Models
February 12	Tests and Evaluations
February 26	Tests and Evaluations
April 1	Professional Team Report
April 15	Module 3 Phase 2 Test Results
April 19	AIR Presentation
April 20	EQE Presentation
April 26	Tillinghast Presentation
April 27	RMS Presentation
May 6	Committee Meetings B Session 1 Adopting Standards
May 20	Committee Meetings B Session 2 Adopting Standards
June 3	Adopting a Specification of Acceptable Computer Models or Output Ranges
August 26	Planning and Update as to Modeling Organization Progress
November 13	Vulnerability Standards Committee Meeting
December 11	Actuarial Standards Committee Meeting

1997

February 7	Review of Standards and Procedures; Vulnerability Standards Committee Meeting
April 11	Review of AIR Model
May 6	Meteorology Standards Committee Meeting
May 7	General Standards Committee Meeting
May 16	Review of AIR Model (Continued); Computer Standards Committee Meeting

May 22	Vulnerability Standards Committee Conference Call Meeting
May 29	Review of AIR Model (Continued); Adoption of 1997 Standards
September 29	Planning for Calendar Year and Review of Models
October 23	Vulnerability Committee Meeting
October 24	Review of AIR Model
December 11 & 12	Review of EQE Model
December 16	Review of RMS Model
1998	
April 23	Committee Meetings
April 24	Committee Meetings; Adoption of 1998 Standards
May 21	Modules and Acceptability Process Adopted
November 17 & 18	Review of Tillinghast Model
November 19 & 20	Review of E.W. Blanch Model
December 8	Review of RMS Model
December 9	Review of EQE Model
December 10	Review of AIR Model
1999	
March 19	Commission Workshop; New Timeframe for Model Review
July 15 & 16	Committee Meetings
July 28	Meteorology Standards Committee Meeting
August 17	Adoption of 1999 Standards and <i>Report of Activities</i>
2000	
March 15	Discussion of Model Submissions and Determination of On-Site Reviews
May 9	Review of AIR Model – Suspended Consideration; E.W. Blanch and RMS Models Determined Acceptable under the 1999 Standards
May 10	EQE Model Determined Acceptable under the 1999 Standards; Review of Risk Engineering Model
May 11	Review of Risk Engineering Model (Continued) – Suspended Consideration
May 12	Review of AIR Model (Continued) – Postponement Approved
July 25 & 26	ARA Model Determined Acceptable under the 1999 Standards
July 27	Committee Meetings
July 28	Committee Meetings; AIR Model Determined Acceptable under the 1999 Standards
September 14 & 15	Adoption of 2000 Standards and <i>Report of Activities</i>
2001	
March 27	Discussion of Model Submissions and Determination of On-Site Reviews
May 10	EQE and E.W. Blanch Models Determined Acceptable under the 2000 Standards

May 11	AIR and ARA Models Determined Acceptable under the 2000 Standards
July 30	RMS Model Determined Acceptable under the 2000 Standards; Committee Meetings
July 31	Committee Meetings
September 18	Canceled due to World Trade Center Bombings
September 19	Adoption of 2001 Standards and <i>Report of Activities</i>
October 15	Adoption of 2001 Standards and <i>Report of Activities</i> (Continued)
2002	
March 27	Discussion of Model Submissions and Determination of On-Site Reviews
May 29	RMS Model Determined Acceptable under the 2001 Standards
May 30	EQE and AIR Models Determined Acceptable under the 2001 Standards
May 31	ARA Model Determined Acceptable under the 2001 Standards
July 23 & 24	Committee Meetings
September 18 & 19	Adoption of 2002 Standards and <i>Report of Activities</i>
2003	
February 20	Continuing Education and Training Workshop – Overview of Methodologies used in Catastrophe Computer Simulation Models
April 1	Discussion of Model Submissions and Determination of On-Site Reviews
May 29	AIR and ARA Models Determined Acceptable under the 2002 Standards
May 30	EQE and RMS Models Determined Acceptable under the 2002 Standards
July 22 & 23	Committee Meetings
August 21 & 22	Adoption of 2003 Standards and <i>Report of Activities</i>
2004	
March 18	Discussion of Model Submissions and Determination of On-Site Reviews
May 12	RMS and ARA Models Determined Acceptable under the 2003 Standards
May 13	AIR and EQE Models Determined Acceptable under the 2003 Standards
July 27 & 28	Committee Meetings
September 15 & 16	Canceled due to Hurricane Ivan
October 6 & 7	Adoption of 2004 Standards and <i>Report of Activities</i>
2005	
March 10 & 11	Discussion of Model Submissions and Determination of On-Site Reviews
June 1	Review of RMS Model
June 2	RMS, AIR, and EQE Models Determined Acceptable under the 2004 Standards
June 3	ARA Model Determined Acceptable under the 2004 Standards
July 15	Acceptability Process Committee Meeting
July 26 - 28	Committee Meetings
August 10	Actuarial Standards and Acceptability Process Committee Meetings

September 14 & 15	Adoption of 2005 Standards and <i>Report of Activities</i>
2006	
January 25 & 26	Workshop to Discuss Modeling Commercial Residential Exposure, Simplification of the Commission's Review Process, and to Review the Study " <i>An Assessment of Computer Generated Loss Costs in Florida</i> "
March 16	Discussion of Model Submissions and Determination of On-Site Reviews
May 16	AIR Model Determined Acceptable under the 2005 Standards; Review of RMS Model
May 17	RMS and ARA Models Determined Acceptable under the 2005 Standards
May 18	EQE Model Determined Acceptable under the 2005 Standards
June 30	Promulgating Rules Conference Call Meeting
July 26 & 27	Committee Meetings and Rule Workshop
August 17 & 18	Adoption of 2006 Standards and <i>Report of Activities</i> ; Approval to file Notice of Proposed Rulemaking for Rule 19-16.001
September 26	Discussion of Rule Hearing comments received on Rule 19-16.001
October 23	Withdrawal of Rule 19-16.001
2007	
March 13	Discussion of Model Submissions and Determination of On-Site Reviews
May 8	ARA Model Determined Acceptable under the 2006 Standards
May 9	EQE and AIR Models Determined Acceptable under the 2006 Standards
June 21	RMS Model Determined Acceptable under the 2006 Standards
August 15 & 16	Committee Meetings
August 17	Florida Public Model Determined Acceptable under the 2006 Standards
September 20 & 21	Adoption of 2007 Standards and <i>Report of Activities</i>
November 5	Approval of Report to the Florida House of Representatives, Comparison of Hurricane Loss Projection Models
December 18	Adoption of an addendum to the <i>Report of Activities</i>
2008	
March 12	Discussion of Model Submissions and Determination of On-Site Reviews
March 21	Discussion of Model Submission and Determination of On-Site Review
May 20	AIR and RMS Models Determined Acceptable under the 2007 Standards
May 21	ARA Model Determined Acceptable under the 2007 Standards
June 23	EQE and Florida Public Model Determined Acceptable under the 2007 Standards
July 28	Public Testimony and Discussion of CS/CS/SB 2860 passed during the 2007 Legislative Session
August 12 & 13	Committee Meetings
September 17 & 18	Adoption of 2008 Standards and <i>Report of Activities</i>

2009

January 29 & 30	Workshop to Discuss Modeling of Commercial Residential Exposure and Short Term Frequency
March 19	Discussion of Model Submissions and Determination of On-Site Reviews
May 19	AIR Model Determined Acceptable under the 2008 Standards
June 2	ARA and Florida Public Model Determined Acceptable under the 2008 Standards
June 3	EQE Model Determined Acceptable under the 2008 Standards; RMS Model Not Determined Acceptable under the 2008 Standards
July 23 & 24	Workshop to Discuss Modeling of Commercial Residential Exposure, Short Term Frequency, and Storm Surge; Discussion of RMS Request to Reconsider Denial of the RMS Model under the 2008 Standards; Adoption of an Addendum to the 2008 <i>Report of Activities</i> ; RMS Model Determined Acceptable under the 2008 Standards
August 11	Committee Meetings
August 12	Windstorm Mitigation Committee Meeting
August 13	Committee Meetings
September 15 & 16	Adoption of 2009 Standards and <i>Report of Activities</i>
September 17	Windstorm Mitigation Committee Meeting
October 29	Windstorm Mitigation Committee Meeting
December 4	Discussion of AIR Request to Submit a Model for Review Outside of the Every Other Year Review Cycle Adopted in the 2009 <i>Report of Activities</i> ; Adoption of an Addendum to the 2009 <i>Report of Activities</i>
December 18	Windstorm Mitigation Committee Meeting

2010

January 15	Discussion on Windstorm Mitigation Discounts Report
January 25	Approval of Windstorm Mitigation Discounts Report to the Governor, the Cabinet, the President of the Senate, and the Speaker of the House of Representatives
April 15	Discussion of AIR Model Submission and Determination of On-Site Review
June 8	AIR Model Determined Acceptable under the 2009 Standards
October 26	Discussion of AIR Model Software Implementation Issue; Acceptability of AIR Model under the 2009 Standards Temporarily Suspended
November 8	Corrected AIR Model Determined Acceptable under the 2009 Standards
December 14	Discussion of Model Submissions and Determination of On-Site Reviews

2011

June 2	ARA and RMS Models Determined Acceptable under the 2009 Standards
June 16	EQE Model Determined Acceptable under the 2009 Standards; Florida Public Model Not Determined Acceptable under the 2009 Standards
August 17 & 18	Reconsideration of the Florida Public Model; Florida Public Model Determined Acceptable under the 2009 Standards; Committee Meetings

September 21 & 22	Corrected RMS Model Determined Acceptable under the 2009 Standards; Committee Meetings
October 19 & 20	Adoption of 2011 Standards and <i>Report of Activities</i>
November 16	Adoption of 2011 Standards and <i>Report of Activities</i> (Continued); Discussion of AIR Request for Consideration of Different Software Versions Acceptable under the 2009 Standards; Review and Action Delegated to Commission Chair with Input of Professional Team
2012	
December 17	Discussion of Model Submissions and Determination of On-Site Reviews; Discussion of RMS Notification of Error in Previous Model
2013	
March 7	Discussion of RMS Error in Previous Model; Acceptability of RMS Model under the 2009 Standards Rescinded; Corrected RMS Model Determined Acceptable under the 2009 Standards
June 18	Workshop to Discuss New Software Platforms, Modeling Storm Surge, Recent Revisions to HURDAT, Recap of Model Review Process; ARA Model Determined Acceptable under the 2011 Standards
June 19	AIR and RMS Models Determined Acceptable under the 2011 Standards
June 20	EQE Model Determined Acceptable under the 2011 Standards; Executive Committee Meeting
August 13	Florida Public Model Determined Acceptable under the 2011 Standards; Discussion of AIR Request for Consideration of New Software Platform Acceptable under the 2011 Standards and Approval of Professional Team to Review On-Site; Approval of Executive Committee Recommendations; Committee Meetings
August 14 & 15	Committee Meetings (Continued)
September 24 & 25	Adoption of 2013 Standards and <i>Report of Activities</i>

Transcript Information

All public meetings of the Florida Commission on Hurricane Loss Projection Methodology are transcribed by a Court Reporter. If you would like to purchase copies of any transcript, contact the Court Reporter for the date of the meeting.

July 14, 1995	Amy Gonter, Habershaw Reporting Service, 850-385-9426
August 10, 1995	Amy Gonter, Habershaw Reporting Service, 850-385-9426
August 24, 1995	Sue Habershaw, Habershaw Reporting Service, 850-385-9426
September 7, 1995	Sue Habershaw, Habershaw Reporting Service, 850-385-9426
September 21, 1995	Nancy Vetterick, Accurate Stenotype Reporters, Inc., 850-878-2221
October 19, 1995	Christine Wheeler, Habershaw Reporting Service, 850-385-9426
November 2, 1995	Cathy Webster, C & N Reporters, 850-926-2020
November 16, 1995	Cathy Webster, C & N Reporters, 850-926-2020
November 30, 1995	Lori Dezell, Kirkland & Associates, 850-222-8390
January 8, 1996	Cathy Webster, C & N Reporters, 850-926-2020
January 29, 1996	Cathy Webster, C & N Reporters, 850-926-2020
February 12, 1996	Cathy Webster, C & N Reporters, 850-926-2020
February 26, 1996	Cathy Webster, C & N Reporters, 850-926-2020
April 1, 1996	Cathy Webster, C & N Reporters, 850-926-2020
April 15, 1996	Cathy Webster, C & N Reporters, 850-926-2020
April 19 & 20, 1996	Cathy Webster, C & N Reporters, 850-926-2020
April 26 & 27, 1996	Cathy Webster, C & N Reporters, 850-926-2020
May 6, 1996	Cathy Webster, C & N Reporters, 850-926-2020
May 20, 1996	Cathy Webster, C & N Reporters, 850-926-2020
June 3, 1996	Nancy Metzke, C & N Reporters, 850-926-2020
August 26, 1996	Cathy Webster, C & N Reporters, 850-926-2020
November 13, 1996	Cathy Webster, C & N Reporters, 850-926-2020
December 11, 1996	Cathy Webster, C & N Reporters, 850-926-2020
February 7, 1997	Cathy Webster, C & N Reporters, 850-926-2020
April 11, 1997	Cathy Webster, C & N Reporters, 850-926-2020
May 6, 1997	Nancy Metzke, C & N Reporters, 850-926-2020
May 7, 1997	Lisa G. Eslinger, C & N Reporters, 850-926-2020
May 16, 1997	Cathy Webster, C & N Reporters, 850-926-2020
May 22, 1997	Cathy Webster, C & N Reporters, 850-926-2020
May 29, 1997	Nancy Metzke, C & N Reporters, 850-926-2020

September 29, 1997	Lisa Girod Jones, Registered Merit Reporter, 850-894-2277
October 23 & 24, 1997	Cathy Webster, C & N Reporters, 850-926-2020
December 11 & 12, 1997	Nancy Metzke, C & N Reporters, 850-926-2020
December 16, 1997	Nancy Metzke, C & N Reporters, 850-926-2020
April 23 & 24, 1998	Nancy Metzke, C & N Reporters, 850-926-2020
May 21, 1998	Cathy Webster, C & N Reporters, 850-926-2020
November 17 - 20, 1998	Cathy Webster, C & N Reporters, 850-926-2020
December 8, 1998	Cathy Webster, C & N Reporters, 850-926-2020
December 9, 1998	Nancy Metzke, C & N Reporters, 850-697-8314
December 10, 1998	Cathy Webster, C & N Reporters, 850-926-2020
March 19, 1999	Cathy Webster, C & N Reporters, 850-926-2020
July 15 & 16, 1999	Nancy Metzke, C & N Reporters, 850-697-8314
July 28, 1999	Nancy Metzke, C & N Reporters, 850-697-8314
August 17, 1999	Debra Krick, Premier Reporting, 850-894-0828
March 15, 2000	Nancy Metzke, C & N Reporters, 850-697-8314
May 9 - 12, 2000	Nancy Metzke, C & N Reporters, 850-697-8314
July 25 - 28, 2000	Nancy Metzke, C & N Reporters, 850-697-8314
September 14 & 15, 2000	Nancy Metzke, C & N Reporters, 850-697-8314
March 27, 2001	Nancy Metzke, C & N Reporters, 850-697-8314
May 10 & 11, 2001	Nancy Metzke, C & N Reporters, 850-697-8314
July 30 & 31, 2001	Nancy Metzke, C & N Reporters, 850-697-8314
September 19, 2001	Nancy Metzke, C & N Reporters, 850-697-8314
October 15, 2001	Mindy Martin, Catherine Wilkinson & Associates, 850-224-0127
March 27, 2002	Mindy Martin, Catherine Wilkinson & Associates, 850-224-0127
May 29 - 31, 2002	Catherine Wilkinson, Catherine Wilkinson & Associates, 850-224-0127
July 23 & 24, 2002	Catherine Wilkinson, Catherine Wilkinson & Associates, 850-224-0127
September 18, 2002	Christine Wheeler, Accurate Stenotype Reporters, Inc., 850-878-2221
September 19, 2002	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
April 1, 2003	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
May 29 & 30, 2003	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
July 22 & 23, 2003	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 21 & 22, 2003	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 18, 2004	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
May 12 & 13, 2004	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
July 27 & 28, 2004	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221

October 6 & 7, 2004	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 10 & 11, 2005	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 1 - 3, 2005	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
July 15, 2005	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
July 26 - 28, 2005	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 10, 2005	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
September 14 & 15, 2005	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 16, 2006	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
May 16 - 18, 2006	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 30, 2006	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
July 26 & 27, 2006	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 17, 2006	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 18, 2006	Danielle Freeze, Accurate Stenotype Reporters, Inc., 850-878-2221
September 26, 2006	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
October 23, 2006	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 13, 2007	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
May 8 & 9, 2007	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 21, 2007	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 15 - 17, 2007	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
September 20 & 21, 2007	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
November 5, 2007	Jo Langston, Accurate Stenotype Reporters, Inc., 850-878-2221
December 18, 2007	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 12, 2008	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 21, 2008	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
May 20 & 21, 2008	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 23, 2008	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
July 28, 2008	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 12 & 13, 2008	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
September 17 & 18, 2008	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
January 29 & 30, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 19, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
May 19, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 2 & 3, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
July 23 & 24, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 11 - 13, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221

September 15 - 17, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
October 29, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
December 4, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
December 18, 2009	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
January 15, 2010	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
January 25, 2010	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
April 15, 2010	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 8, 2010	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
October 26, 2010	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
November 8, 2010	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
December 14, 2010	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 2, 2011	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
June 16, 2011	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 17, 2011	Tracy Brown, Accurate Stenotype Reporters, Inc., 850-878-2221
August 18, 2011	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
September 21, 2011	Tracy Brown, Accurate Stenotype Reporters, Inc., 850-878-2221
September 22, 2011	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
October 19, 2011	Sarah Gilroy, Accurate Stenotype Reporters, Inc., 850-878-2221
October 20, 2011	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
November 16, 2011	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
December 17, 2012	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
March 7, 2013	Tracy Brown, Accurate Stenotype Reporters, Inc., 850-878-2221
June 18, 2013	Tracy Brown, Accurate Stenotype Reporters, Inc., 850-878-2221
June 19, 2013	Tracy Brown, Accurate Stenotype Reporters, Inc., 850-878-2221
June 20, 2013	Tracy Brown, Accurate Stenotype Reporters, Inc., 850-878-2221
August 13, 2013	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 14, 2013	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
August 15, 2013	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
September 24, 2013	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221
September 25, 2013	Lori Dezell, Accurate Stenotype Reporters, Inc., 850-878-2221

Commission Documentation

The State Board of Administration, in its responsibility as administrator for the Commission, maintains documentation for all meetings of the Commission. This information may be obtained by writing to:

Donna Sirmons
Florida Commission on Hurricane Loss Projection Methodology
c/o State Board of Administration
P. O. Box 13300
Tallahassee, Florida 32317-3300

or by e-mailing to donna.sirmons@sbafla.com.

There is a \$0.15 charge per page per s. 119.07(4)(a), F.S.

This publication is available for a charge of \$11.12.

Documentation is also available on the Commission website at www.sbafla.com/methodology.