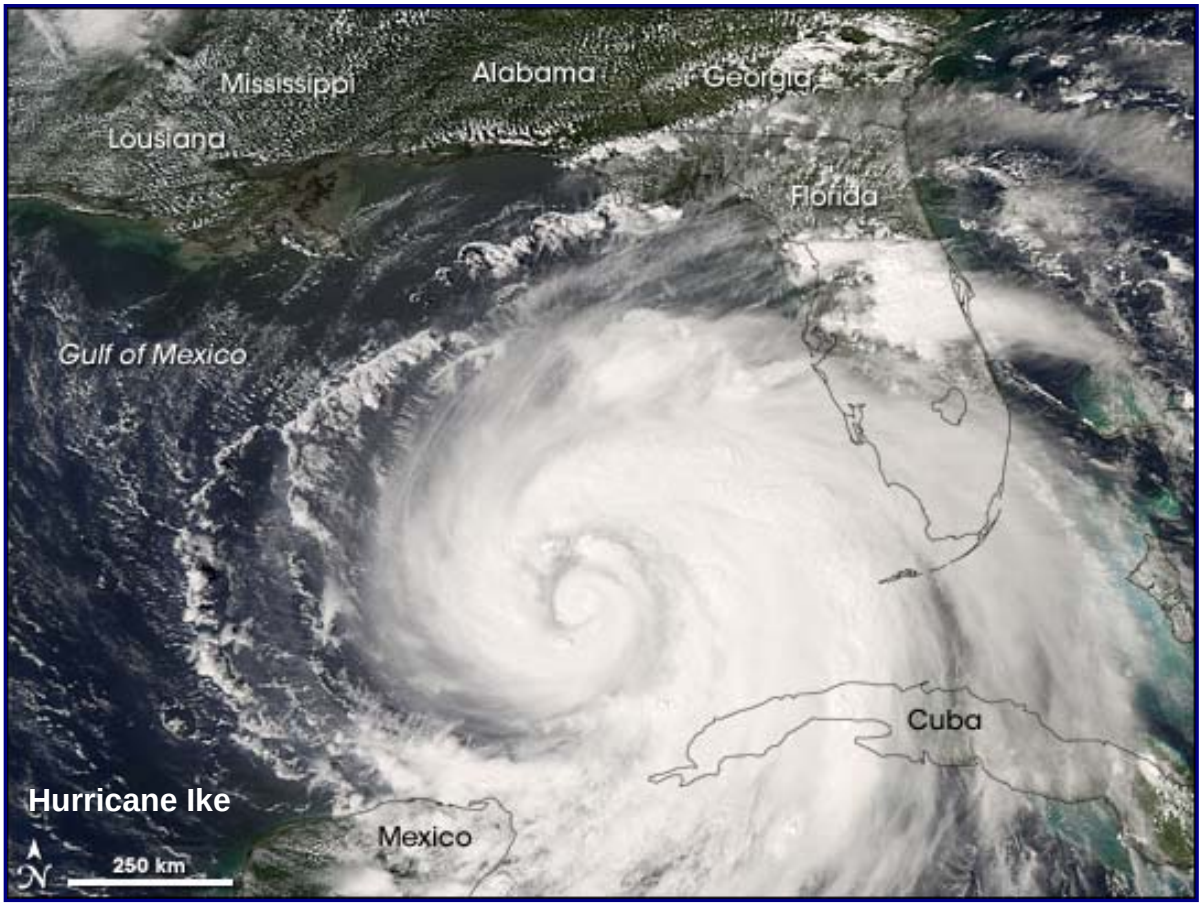
Report of Activities as of November 1, 2008



Florida Commission on Hurricane Loss Projection Methodology

FLORIDA COMMISSION ON HURRICANE
LOSS PROJECTION METHODOLOGY

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November, 2008

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The Honorable Alex Sink, Treasurer
Chief Financial Officer
Plaza Level 11, The Capitol
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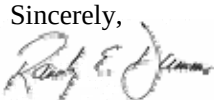
Dear Trustees:

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, 2008*. This report documents the thirteenth 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 at least annually." 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) 644-7880.

Sincerely,



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I. INTRODUCTION

INTRODUCTION

Legislative Findings and Intent

The Florida Commission on Hurricane Loss Projection Methodology (Commission) was established during the 1995 Legislative Session. CS/HB 2619, passed on May 8, 1995, and signed by the Governor on June 14, 1995, created s. 627.0628, Florida Statutes (F.S.). The Legislature specifically determined, in s. 627.0628(1), F.S., 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," s. 627.0628(1)(a), F.S. 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). Individual insurers are required to use the Commission's findings in order to support or justify a rate filing. Section 627.0628(3)(d), F.S., provides that "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), Department of Financial Services. Section 627.0628(3)(d), F.S., also provides that "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."

House Bill 1939 was passed during the 2005 regular Legislative Session and was signed into law by the Governor. This legislation impacted the Commission by creating language related to the definition of and the protection of trade secrets used in designing and constructing a hurricane loss model. In s. 627.0628(3), F.S., 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. Trade secrets, as defined in s. 812.081, F.S., used in the design and construction of a hurricane loss model are exempt pursuant to s. 627.0628(3), 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.

Section 812.081, F.S., defines trade secrets as follows:

> **Trade secrets**; theft, embezzlement; unlawful copying; definitions; penalty.--
> (1) As used in this section:
>
> ****
>
> (c) "Trade secret" means the whole or any portion or phase of any formula, pattern, device, combination of devices, or compilation of information which is for use, or is used, in the operation of a business and which provides the business an advantage, or an opportunity to obtain an advantage, over those who do not know or use it. "Trade secret" includes any scientific, technical, or commercial information, including any design, process, procedure, list of suppliers, list of customers, business code, or improvement thereof. Irrespective of novelty, invention, patentability, the state of the prior art, and the level of skill in the business, art, or field to which the subject matter pertains, a trade secret is considered to be:
>
> 1. Secret;
> 2. Of value;
> 3. For use or in use by the business; and
> 4. Of advantage to the business, or providing an opportunity to obtain an advantage, over those who do not know or use it
>
> when the owner thereof takes measures to prevent it from becoming available to persons other than those selected by the owner to have access thereto for limited purposes.

The Work of the Commission

The Commission, a panel of experts, was created 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…," s. 627.0628(1)(b), F.S. 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 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 – Modeler 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.

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

May 1997
May 1998
August 1999

September 2000
October 2001
September 2002
August 2003
October 2004
September 2005
August 2006
September 2007
September 2008.

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.

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.

Modeling Organization	**Standards**
AIR Worldwide Corporation	1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007
Applied Research Associates, Inc.	1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007
E.W. Blanch Co.	1998, 1999, 2000
EQECAT, Inc.	1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007
Florida Public Hurricane Loss Model	2006, 2007

Modeling Organization	Standards
Risk Management Solutions, Inc.	1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007
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 resulting from hurricanes and to adopt findings regarding the accuracy or reliability of these methodologies for use in residential rate filings. *History-New 9/21/95, rev. 11/30/95*

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 modelers. *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 annual revision of standards, and, where and when appropriate, develop new standards or revise existing standards to reflect these advances. *History-New 8/18/06*

13. The Commission shall consider how statutory changes shall be incorporated in its annual 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*

14. The Commission's annual review of models or methods for acceptability shall give priority to new standards and standards that have been modified. *History-New 8/18/06*

15. The output of models or methods shall be reasonable and the modeler 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. A transcript shall not be recorded 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*

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 eleven 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.

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;
    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.

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.

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 and committee meeting;
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 Modelers directly, except in conjunction with communications during the on-site visit of a Commission member,
    b. Modelers should not contact Commission members or Professional Team members directly,
    c. Professional Team members should not contact Commission members or Modelers directly;
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. 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.

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 Modeler 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 modeler 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 modeler'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 will be seven days prior to the Commission meeting to review modeler submissions, and for additional verification review visits, seven days prior to the Commission meeting to review models for acceptability, in order for the requests to be placed on the meeting agendas.

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.

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; however, the Commission member's presence shall not disrupt the activities and/or work of the Professional Team. This procedure will limit the 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 modeler 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 modeler and Commission members, and the modeler 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 modeler 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 modeler 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 modeler.

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 meetings laws of Florida. Since Professional Team members have signed contracts with the SBA that contain a confidentiality clause accepted by each modeler and are prohibited from discussing such proprietary information, Commission members cannot be included in any activities, meetings, or deliberations by 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 modeler 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 at the Commission meeting to review modeler submissions. The list will be provided to the modeler 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 List): The Commission may develop an additional Trade Secret List of information, documents, and/or presentation materials that contain potential trade secrets used in the design or construction of the hurricane loss model that the Commission wants to see and/or to discuss during the closed portion of the Commission meeting to review models for acceptability. The Trade Secret List will be included in the *Report of Activities* in the Acceptability Process section. The Trade Secret List will be organized under major categories, i.e., general trade secrets, meteorological trade secrets, vulnerability trade secrets, actuarial trade secrets, statistical trade secrets, and computer trade secrets.

The trade secret material shown to the Commission will be under the control of the modeler. 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 meetings 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.

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 personnel associated with the particular model under consideration.

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 modeler trade secrets should be addressed directly to the modeler 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 modeler 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 modeler. 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 modeler, 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 modelers 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 modeler, Commission staff will contact, from the meeting room, additional modeler 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: No transcripts will be recorded 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 eleven Commission members, i.e., six 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 14 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. However, 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 public portions of Commission meetings are recorded. The transcribed record shall be maintained by SBA staff. There will be no 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 five types of meetings: (1) Committee meetings designed to review and revise the Commission's Standards, Disclosures, and Forms, the Acceptability Process, and other sections of the *Report of Activities*, (2) Commission meetings for the purpose of adopting revisions to the Standards, Disclosures, and Forms, the Acceptability Process, and other sections of the *Report of Activities*, (3) Commission meeting for the purpose of reviewing model submissions, (4) Commission meetings for reviewing model acceptability, and (5) 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. The discussions from these workshops may be used in planning for future Standards, Disclosures, and Forms. The meeting to review model acceptability may involve the discussion of modeler trade secrets. The Commission shall conduct the portion of the 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, modelers, insurers, regulators, and the general public are encouraged to participate and provide input. A working draft of proposed revisions to the Standards, Disclosures, and Forms, the 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 aide 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, modelers, 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 modeler 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 List

    The Committee will identify a Trade Secret List of information, documents, and/or presentation materials that contain potential trade secrets used in the design or construction of the hurricane loss model that the Commission wants the modeler to visually display or discuss during the closed portion of the 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 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, the Forms, and the Trade Secret List. 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 modelers, 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 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 Meeting to Review Modeler Submissions

The purpose of the meeting to review the modeler submissions is to identify any "deficiencies" in the submissions, to create a list of "issues" to be addressed by each modeler, and to determine the time frame needed to review trade secrets during the closed meeting for each modeler.

Modeler submissions must be received by the February 28 deadline, 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 issues or deficiencies. Prior to the meeting, the Commission Chair working with SBA staff and the Professional Team may request that the modeler meet with the Commission (in person or by conference call) or provide additional information to clarify the submission.

Deficiency: A lack of required documentation is defined as a deficiency. A list of deficiencies will be created if the modeler's 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 modeler 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 of a modeler 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 modeler 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 modeler to submit additional public documentation that is not required of all modelers. Issues should be addressed by the modeler with the Professional Team during the on-site review as well as with the Commission when the modeler 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 modelers. Otherwise, some modelers might be put in an awkward position and vulnerable to making more information about their model public than other modelers 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 modeler submissions, the Commission Chair will take up one modeler 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 modeler'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 each of the Commission members regarding deficiencies that have been identified and that need to be corrected. 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.

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 motion should include a specific time frame for correcting any deficiencies in the submission. The modeler 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 the 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 modeler has not been responsive to the submission requirements and vote to terminate the review process.

After review of each grouping of Standards, the Commission will determine the amount of time (one to two hours) that will be allocated for each closed meeting to discuss trade secrets based upon the model submission received.

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 Trade Secret List.

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) Vulnerability Standards, (4) Actuarial Standards, (5) Statistical 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 Commission members if the modeler responded to all deficiencies identified in the meeting to review modeler submissions in the manner specified by the Commission. The Commission Chair may call upon SBA staff or Professional Team members to comment and may also entertain discussion from Commission members or the modeler. Failure to provide the information required in the Trade Secret List 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.

The Commission Chair will then call upon the modeler to provide an overview presentation as required in the Acceptability Process of the *Report of Activities*. The modeler 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 read the first Standard and will call upon the modeler 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 finds the model to have met all the Standards. The Commission Chair will indicate to the modeler that the modeler 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.

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, engineering, actuarial science, statistics, 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.

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., a/k/a "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 Weekly and a transcript is taken and preserved.

Penalty for Violating s. 812.081, F.S.: Section 812.081, F.S., provides the following penalty for violating the confidentiality of trade secrets:

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(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, at least annually, adopt revisions to previously adopted actuarial methods, principles, standards, models, or output ranges. 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.

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. 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.

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;
- Vulnerability Standards assessing the impact of the hurricane winds on residential property;
- Actuarial Standards assessing the damage impact in insurance terms;
- Statistical Standards addressing the statistical foundation of the model and the sensitivity and uncertainty assessment of model outputs as a function of model inputs;
- 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 annually reviews and revises the Standards comprising

its yearly *Report of Activities*. The Commission finds that the Standards adopted each 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 modelers 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 modeler provide certain documents for direct review by Commission members or the modeler 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 each 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 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. On the other hand, any minor revisions, changes to the Standards, or any changes to the model by the modeler that do not result in changes to loss costs 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 February 28 following the adoption of each year's Standards. Any modeling organization that fails to notify the Commission by February 28 that it desires such a review under the most recently adopted Standards or fails to be found acceptable in accordance with those Standards shall not be considered for review until the Standards are again revised or reviewed.

The Commission has further determined that the period between November 1, the effective date of new and revised Standards, and February 28, the deadline for notification by the modeler, is a reasonable amount of time for any modeler to comply with the Standards adopted by the Commission. If the Commission determines that four months 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 modeler, 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 modeler.

I. Scheduling

The following schedule is anticipated in 2009:

2/27/09	Modeler submissions received
3/9/09 – 3/13/09	Time period for Commission meeting to review modeler submissions
3/13/09	Pre-visit letters sent to modelers and Commission members
3/16/09 – 3/20/09	Time period for pre-visit modeler conference calls if requested by a modeler
3/23/09 – 5/8/09	Time period for on-site reviews
5/11/09 – 5/29/09	Time period for Commission meetings to review models for acceptability
6/1/09 – 6/26/09	Time period for additional verification reviews
6/29/09 – 7/31/09	Time period for Commission meetings to review models for acceptability
8/3/09 – 8/28/09	Time period for Commission committee meetings
9/7/09 – 9/25/09	Time period for Commission meetings to adopt 2009 Standards and *Report of Activities*

II. Notification Requirements

An "existing" organization is defined as an organization whose model was accepted by the Commission under the previous year's Standards. All other modeling organizations are considered as "new."

A. <u>Notification of Readiness for Review.</u> Any modeling organization desiring to have its model reviewed for acceptability by the Commission shall notify the Chair of the Commission in writing by February 28 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, G-2, G-3, G-4, G-5, G-6, and the Editorial Certification Form G-7, a statement that professionals having credentials and/or experience in the areas of meteorology, engineering, actuarial science, statistics, 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 must 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 year's Standards.

3. A general description of any trade secret information that the modeler intends to present to the Professional Team.

4. Twenty (20) bound copies (duplexed) and twenty (20) CDs of all documentation. The electronic copies of the submission shall be provided in the following manner:

    a. Form M-1, Form M-3, Form V-2, Form A-3, Form A-4, Form A-5, Form A-6, Form A-7, and Form A-9, shall be provided on CD in Excel format;

    b. Form A-1 shall be provided on CD in Excel and PDF format;

    c. Form S-6 shall be provided on CD in ASCII and PDF format for models submitted by modeling organizations, which have not previously provided this analysis to the Commission;

    d. The remaining portions of the submission shall be provided on CD in PDF format;

    e. All data file names shall include the abbreviated name of the modeler, the Standards year, and the Form name (when applicable);

    f. The PDF submission files shall be highlightable and 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;

    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 modeler 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. 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;

   3. 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 be comprised of an appropriate number of intervals to provide readability;

f. All units of measurement for model inputs and outputs shall be clearly identified;

g. All model outputs of length, windspeed, and pressure shall be in units of statute miles, statute miles per hour, and millibars, respectively;

h. Unless otherwise specified, windfields generated by the model shall be used for completing relevant Forms and tables in the submission;

i. A hard copy of each Form (with the exception of Forms A-1 and S-6) shall be included in the submission document;

j. If used, acronyms shall be defined on their first use in the submission;

k. All column headings shall be shown and repeated at the top of each subsequent page for Forms and tables.

6. The modeler 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. <u>Revisions to the Standards or the Model – Not Significant.</u> 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 modeler's letter and any other documentation provided and determine whether the model will be considered acceptable for only one additional year, whether an on-site review by the Professional Team is warranted, and whether a meeting with the Commission is warranted.

C. <u>Revisions to the Standards or the Model – Significant.</u> 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 year 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 February 28 notification date.

D. The modeler 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 the modeler submissions are received by the February 28 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 modeler shall submit corrections for the deficiencies identified during this meeting 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.** All revised file names shall include the revision date, the abbreviated name of the modeler, the Standards year, and the Form name (when applicable) in the file name. Failure of the modeler to correct any deficiencies 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.

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 List.

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 material described in the Trade Secret List 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 List or with one or more Standards.

    a. The Professional Team may react to possible corrections proposed by the modeler but will not tell the modeler 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 February 28 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 30 days of this notification. The modeler 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. The additional verification review will be scheduled to be held after the May 2009 Commission meetings to review models for acceptability.

        If any problem necessitates the re-generation of the output ranges (Form A-6), the modeler must submit revised output ranges to be received by the Commission no less than two weeks prior to the initial date of the on-site review. If this is not the case, then Standards A-6 and A-10 will not be verified during the initial on-site review.

c. If the modeling organization disagrees with the Professional Team as to likelihood of compliance, the modeler has two options: (1) it can proceed to the scheduled May 2009 Commission meeting 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 modeler, 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 (<u>additions</u>). If revision marks are provided in color, material deleted and stricken shall be in red, and material added and underlined shall be in blue.

Revised documentation shall include a chronological detailed description of each substantive change to the model (whether identified by the modeler, the Commission, or the Professional Team) since the current year's initial submission, including all interim changes.

Complete documentation shall be received no less than 10 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 documents. Final documents found acceptable by the Commission will be posted on the website.

If an additional verification review is requested, complete documentation shall be received within 30 days of the request.

The modeler shall provide one (1) CD containing all complete documentation without revision marks. If more than ten (10) pages are revised, twenty (20) bound copies (duplexed) and twenty (20) CDs of all complete documentation with revision marks for all revisions made to the original February 28 submission shall be provided. If ten (10) pages or fewer (exclusive of Form A-6) are revised, only twenty (20) hard copies of the revised pages and Form A-6 (if revised) shall be submitted in addition to the twenty (20) CDs of all complete documentation. The format of the revised documentation shall be as specified under II.A.4 and 5.

VI. Review by the Commission

A. <u>General Review of a Modeling Organization.</u> 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 modeler'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 modeler 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 modeler.

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. Modeler Presentation. All modelers shall make a presentation to the Commission with respect to the model as used for residential ratemaking purposes in Florida. The modeler presentation is for the purpose of helping the Commission understand outstanding issues as well as how the modeler 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 modeler 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 modeler 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.

Closed Meeting Portion

During the closed meeting where trade secrets used in the design and construction of the hurricane loss model are discussed, the modeler presentation shall include an explanation of the materials required in the Trade Secret List. All material presented shall be complete, i.e. 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 modeler to the Commission.

The modeler shall have available all trade secret exhibits related to the Trade Secret List used to support the model during the on-site and/or additional verification reviews, excluding items that the modeler is precluded from releasing due to third party contracts.

In order to meet the public meeting notice requirements for the public meeting portion, one to two hours shall be scheduled for this closed meeting.

A hard copy of the modeler's prepared presentation and Form V-3 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 modeler at the conclusion of the closed meeting and prior to anyone leaving the meeting room.

Trade Secret List

Meteorological

- Proprietary variations, if any, in the model surface windfield from a published windfield, and all source code relevant to the model surface windfield.
- Model formulation for the vertical variation of the hurricane windfield including the data, methods, calculations, and procedures used.
- The basis for all short- and long-term climatic variations in storm frequencies.

Vulnerability

- Completed Form V-3 with the data, methods, calculations, and procedures used.

Actuarial

- Complete description of the data, methods, calculations, and procedures used to develop probable maximum loss levels in the model.

Computer

- Supportive design diagrams, equations, and pseudo-code and the associated translations to computer code shall be available for the above items.

Public Meeting Portion

The modeler 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 modeler'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. <u>Acceptability and Notification.</u> 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.

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 Modeler)

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 personal residential rate filings. The determination of acceptability expires on September 1, 2010, unless the modeler has complied with the procedures specified in the Acceptability Process in the *Report of Activities as of November 1, 2009,* in order to maintain its acceptability and makes a submission by February 28, 2010.

The Commission has determined that the (name and version of model) complies with the Standards adopted by the Commission on (date of adoption), and concludes that the (name and version of the model) is sufficiently accurate and reliable for projecting hurricane loss costs and probable maximum loss levels for personal 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. <u>Discovery of Errors and/or Changes to a Model after the Model has been Determined to be Acceptable by the Commission.</u> If a modeler discovers that material errors have been made in the model or the submission, the modeler shall immediately notify the Chair of the Commission in writing. The notification shall detail the nature of the error or change to the model, why it occurred, what is needed or has been done to correct the problem, the time frame needed for making the correction, and any other relevant documentation necessary to describe both the error/change and the correction. The Chair shall (1) review the notification and inform the Commission members as soon as possible; (2) determine the need for a special meeting or whether the issue can be addressed at the next regularly scheduled meeting of the Commission; and (3) assess, with at least two members of the Professional Team, the severity of the error and determine whether the error warrants a temporary suspension of the acceptability of the model until the Commission has had an opportunity to review the matter.

The Chair shall send a letter to the modeling organization as soon as practical notifying the organization of the receipt of the error/change to the model notification and any decisions of the Chair pending review by the Commission.

If a modeler intentionally fails to notify or unreasonably delays the notification of the Commission of any errors or changes to a model, which has been previously found acceptable by the Commission, the Commission shall review and investigate the circumstances and determine the appropriate course of action.

Model Submission Checklist

1. Please indicate by checking below that the following has been included in your submission 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, engineering, actuarial science, statistics, 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 modeler intends to present to the Professional Team
		4. Model Identification
		5. 20 Bound Copies (duplexed)
		6. 20 CDs containing:
		a. Submission text in PDF format
		b. PDF file highlightable and bookmarked by Standard, Form, and section
		c. Data file names include abbreviated name of modeler, Standards year, and Form name (when applicable)
		d. Forms A-1 and S-6 (for models submitted by modeling organizations which have not previously provided the Commission with this analysis) in PDF format
		e. Forms M-1, M-3, V-2, A-1, A-3, A-4, A-5, A-6, A-7, and A-9 in Excel format
		f. Form S-6 (for models submitted by modeling organizations which have not previously provided the Commission with this analysis) in ASCII format
		7. Table of Contents
		8. Materials consecutively numbered from beginning to end starting with the first page (including cover) using a single numbering system
		9. All tables, graphs, and other non-text items consecutively numbered using whole numbers
		10. All tables, graphs, and other non-text items specifically listed in Table of Contents
		11. All tables, graphs, and other non-text items clearly labeled with abbreviations defined
		12. All column headings shown and repeated at the top of every subsequent page for Forms and tables
		13. Standards, Disclosures, and Forms in *italics*, modeler responses in non-italics
		14. Graphs accompanied by legends and labels for all elements
		15. All units of measurement clearly identified with appropriate units used
		16. Hard copy of all Forms included in submission document except Forms A-1 and S-6 (for models submitted by modeling organizations which have not previously provided the Commission with this analysis)

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

_____

_____

_____

_____

Model Name	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 the Trade Secret List. 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 modeler. For existing modelers, 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 modeler could recalibrate the model solely for producing desirable results.

3. Verification that information provided by the modeler 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 the Trade Secret List.

Feedback regarding compliance of the model with the Standards, Disclosures, Forms, and Trade Secret List 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 modeler in preparing for the on-site review, by providing to the SBA a detailed pre-visit letter (to be sent to the modeler) outlining specific issues to be addressed by each modeler unique to their model submission.

Telephone Conference Call: After the Commission has determined the modeler is ready to continue in the review process and prior to the on-site review, at the request of the Commission or the modeler, the SBA staff will arrange a telephone conference call between the modeler 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 modeler 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 modelers 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 modeler 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 modeler 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 modeler conduct a detailed self-audit to assure that it is ready for the Professional Team review.

Presentation of Materials: The modeler 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 modeler intends to present to the Commission, including the Trade Secret List material, 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.

Professional Team Report

After completing its review of the Standards, Disclosures, Forms, and Trade Secret List, the Professional Team will conduct an exit briefing with the modeler. During this briefing, the Professional Team will provide a preliminary draft of the Professional Team report. This offers the modeler an opportunity to check for any factual errors and to expunge any trade secret information. The Professional Team will accede to modeler suggestions for changes in its draft only to correct factual errors and to remove any trade secret information. If the modeler 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 modeler 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 modeler.

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 10 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 statement indicating where proprietary information has been removed.

After leaving the modeler's premises, the Professional Team, in coordination with SBA staff, will finalize its report and provide it to all 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 List 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 List 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/or Trade Secret List.

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 modeler to identify to all Professional Team members what is a trade secret and is <u>not</u> to be made public.

All written documentation provided by the modeler 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 modeler 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 modeler 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 modeler 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 modeler 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 modeler.

Trade secrets of the modeler 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 modeler.

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

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 modelers.

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 modeler'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 modeler 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.

VII. 2008 STANDARDS, DISCLOSURES, AND FORMS

Florida Commission on
Hurricane Loss Projection Methodology

Model Identification

Name of Model and Version: _____

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 modeler on the enclosed CD.

Input Data

Name	Description
2008FormM1.pdf	Storms used for historical frequencies in Form M-1 – Annual Occurrence Rates
FormV1Input08.xls	Windspeeds for 336 ZIP Codes for Form V-1 – One Hypothetical Event
FormA1Input08.xls	Exposure data (construction type and ZIP Codes) for Form V-1 – One Hypothetical Event, Form A-1 – Loss Costs, and Form S-2 – An Example of Loss Exceedance Estimates Based on a Limited Hypothetical Data Set
hlpm2007.exe	2007 FHCF aggregate exposure data for Form A-3 – Base Hurricane Storm Set Statewide Loss Costs, Form A-4 – Hurricane Andrew (1992) Percent of Losses, Form A-5 – Cumulative Losses from the 2004 Hurricane Season, Form A-6 – Output Ranges, Form A-7 – Percentage Change in Output Ranges, Form A-8 – Percentage Change in Output Ranges by County, Form A-9 – Probable Maximum Loss for Florida, Form S-2 – An Example of Loss Exceedance Estimates Based on a Limited Hypothetical Data Set, and Form S-5 – Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled
2008FormA6.xls	Output ranges format for Form A-6
07FHCFWts.xls	2007 weights for Form A-6
FormS6Input08.xls	Input values for 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)

Modelers shall provide output in specified output files as listed below. XXX denotes the abbreviated name of the modeler.

Output Data

Name	Description
XXX08FormM1.xls	Output data from Form M-1 – Annual Occurrence Rates
XXX08FormM3.xls	Output data from Form M-3 – Radius of Maximum Winds and Radii of Standard Wind Thresholds
XXX08FormV2.xls	Output data from Form V-2 – Mitigation Measures – Range of Changes in Damage
XXX08FormA1.xls	Output data from Form A-1 – Loss Costs
XXX08FormA3.xls	Output data from Form A-3 – Base Hurricane Storm Set Statewide Loss Costs
XXX08FormA4.xls	Output data from Form A-4 – Hurricane Andrew (1992) Percent of Losses
XXX08FormA5.xls	Output data from Form A-5 – Cumulative Losses from the 2004 Hurricane Season
XXX08FormA6.xls	Output data from Form A-6 – Output Ranges
XXX08FormA7.xls	Output data from Form A-7 – Percentage Change in Output Ranges
XXX08FormA9.xls	Output data from Form A-9 – Probable Maximum Loss for Florida
XXX08FormS61SA.dat	Windspeed output from Form S-6 – Sensitivity Analysis all variables, category 1 hurricane (requirement for models submitted by modeling organizations which have not previously provided the

Name	Description
	Commission with this analysis)
XXX08FormS61UACP.dat	Windspeed output from Form S-6 – Uncertainty Analysis CP, category 1 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS61UARmax.dat	Windspeed output from Form S-6 – Uncertainty Analysis Rmax, category 1 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS61UAVT.dat	Windspeed output from Form S-6 – Uncertainty Analysis VT, category 1 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS61UAQuantile1.dat	Windspeed output from Form S-6 – Uncertainty Analysis Quantile, category 1 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS63SA.dat	Windspeed output from Form S-6 – Sensitivity Analysis all variables, category 3 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS63UACP.dat	Windspeed output from Form S-6 – Uncertainty Analysis CP, category 3 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS63UARmax.dat	Windspeed output from Form S-6 – Uncertainty Analysis Rmax, category 3 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS63UAVT.dat	Windspeed output from Form S-6 – Uncertainty Analysis VT, category 3 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS63UAQuantile1.dat	Windspeed output from Form S-6 – Uncertainty Analysis Quantile, category 3 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS65SA.dat	Windspeed output from Form S-6 – Sensitivity Analysis all variables, category 5 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS65UACP.dat	Windspeed output from Form S-6 – Uncertainty Analysis CP, category 5 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS65UARmax.dat	Windspeed output from Form S-6 – Uncertainty Analysis Rmax, category 5 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)
XXX08FormS65UAVT.dat	Windspeed output from Form S-6 – Uncertainty Analysis VT, category 5 hurricane (requirement for models submitted by modeling organizations which have not previously provided the

Name	Description
	Commission with this analysis)
XXX08FormS65UAQuantile1.dat	Windspeed output from Form S-6 – Uncertainty Analysis Quantile, category 5 hurricane (requirement for models submitted by modeling organizations which have not previously provided the Commission with this analysis)

The modeler 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 on CD in Excel and PDF format as specified. The file names shall include the abbreviated name of the modeler, the Standards year, and the Form name.

"FormA1Input08.xls" data set consists of one $100,000 structure for each construction type for each ZIP Code in Florida. The data set contains 4,437 records. The following table is a description of the fields in the data set.

No.	Field Name	Description
1.	County Code	Federal Information Processing Standards (FIPS) County Code – see ***Figure 1***
2.	ZIP Code	5-digit ZIP Code
3.	Construction Type	The following codes will be used: 1 = Wood Frame, 2 = Masonry, 3 = Mobile Home
4.	Deductible	2% policy deductible for all records
5.	Total Insured Value - Structure	$100,000 for all records
6.	Total Insured Value - Appurtenant Structures	$10,000 for all records
7.	Total Insured Value - Contents	$50,000 for all records
8.	Total Insured Value - Additional Living Expense	$20,000 for all records

The modeler is directed to make the following assumptions with the analysis:

- Each structure is insured 100% to value
- Per Diem = $150.00/day per policy, if used
- Number of stories = 1
- Occupancy type = Single Family Dwelling
- Year of Construction = 1980
- Tide at landfall is 0 meters
- If the model assumes different construction types other than those provided with the data, map the codes the Commission has provided to the appropriate codes. Provide a copy of this mapping and proper documentation describing the reason for the mapping.
- Verify that only population weighted centroids were used for the location of risks within the ZIP Code, where more specific locations were not available.

All other assumptions that the modeler must make with the analysis shall be reviewed with SBA staff. The intent is to keep all assumptions consistent among the modelers.

Figure 1

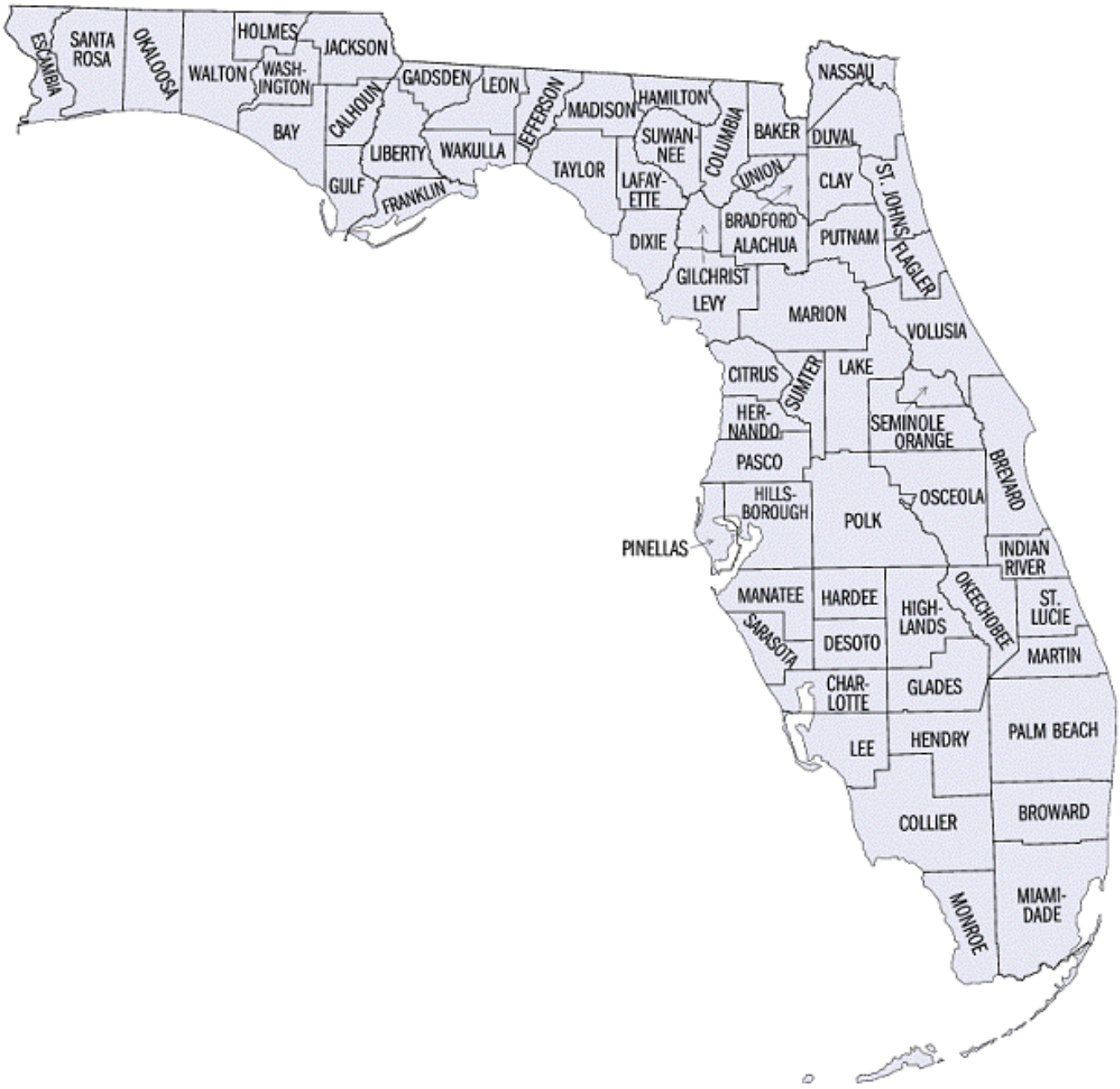
Florida County Codes

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 2008 Standards to 2007 Standards

Standard	Title	Comments
General		
G-1	Scope of the Computer Model and Its Implementation	Significant Revision
G-2	Qualifications of Modeler Personnel and Consultants	Significant Revision
G-3	Risk Location	
G-4	Independence of Model Components	
G-5	Editorial Compliance	Significant Revision due to new Audit language
Meteorological		
M-1	Base Hurricane Storm Set	Significant Revision
M-2	Hurricane Parameters and Characteristics	
M-3	Hurricane Probabilities	
M-4	Hurricane Windfield Structure	
M-5	Landfall and Over-Land Weakening Methodologies	
M-6	Logical Relationships of Hurricane Characteristics	
Vulnerability		
V-1	Derivation of Vulnerability Functions	
V-2	Mitigation Measures	
Actuarial		
A-1	Modeled Loss Costs and Probable Maximum Loss Levels	Significant Revision
A-2	Underwriting Assumptions	Significant Revision
A-3	Loss Costs Projections and Probable Maximum Loss Levels	Significant Revision
A-4	Demand Surge	Significant Revision
A-5	User Inputs	
A-6	Logical Relationship to Risk	Significant Revision due to new Form
A-7	Deductibles and Policy Limits	
A-8	Contents	
A-9	Additional Living Expense (ALE)	
A-10	Output Ranges	
A-11	Probable Maximum Loss	New Standard
Statistical		
S-1	Modeled Results and Goodness-of-Fit	Significant Revision due to new Form and Audit language
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	
Computer		
C-1	Documentation	Significant Revision
C-2	Requirements	
C-3	Model Architecture and Component Design	
C-4	Implementation	
C-5	Verification	
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. 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)*

The computer model shall project loss costs and probable maximum loss levels for personal lines residential property insured damage from hurricane events.

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 personal lines residential property insured damage from hurricane events.

Disclosures

1. Specify the model and program version number.

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 personal lines 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 damage 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 a detailed description of all changes in the model from the prior year's submission to the initial submission this year. Provide the effect of each change on personal lines residential loss costs.

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. All software located within the model, used to compile data used by the model, used to validate the model, and used to project model loss costs and probable maximum loss levels (1) fall within the scope of the Computer Standards, and (2) will be reviewed interactively (viewed simultaneously by all Professional Team members in conjunction with the review of each Standard).

3. Databases or data files relevant to the modeler's submission will be reviewed.

G-2 Qualifications of Modeler Personnel and Consultants*

*(*Significant Revision)*

A. Model construction, testing, and evaluation shall be performed by modeler 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 or any modifications to an accepted model shall be reviewed by either modeler 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 be signatories on Forms G-1 through G-6 as applicable and shall abide by the standards of professional conduct if adopted by their profession.

Purpose: Professional disciplines implicitly represented in Commission Standards (structural/wind engineering, statistics, actuarial science, meteorology, computer/information science) shall be represented among modeler 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.

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 modeler's services.

   E. Indicate how long the model has been used for analyzing insurance company exposures or other such uses. Describe these uses.

F. 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 following aspects of the model:

1. Meteorology
2. Vulnerability
3. Actuarial Science
4. Statistics
5. Computer Science

B. Identify any new employees or consultants (since the previous submission) working on the model.

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, consumer advocacy group, or a government entity as well as their involvement with consulting activities.

3. Independent Peer Review

A. Provide dates of external independent peer reviews that have been performed on the following components as currently functioning in the model:

1. Meteorology
2. Vulnerability
3. Actuarial Science
4. Statistics
5. Computer Science

B. Provide documentation of independent peer reviews directly relevant to the modeler'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.

5. Provide a completed Form G-2, Meteorological Standards Expert Certification.

6. Provide a completed Form G-3, Vulnerability Standards Expert Certification.

7. Provide a completed Form G-4, Actuarial Standards Expert Certification.

8. Provide a completed Form G-5, Statistical Standards Expert Certification.

9. Provide a completed Form G-6, Computer Standards Expert Certification.

Audit

1. The professional vitae of modeler 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, G-2, G-3, G-4, G-5, G-6, 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 modeler 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

A. ZIP Codes used in the model shall be updated at least every 24 months using information originating from the United States Postal Service. The United States Postal Service issue date of the updated information shall be reasonable.

B. ZIP Code centroids, when used in the model, shall be based on population data.

C. ZIP Code information purchased by the modeler shall be verified by the modeler for accuracy and appropriateness.

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.

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.

Audit

1. Provide geographic displays for all ZIP Codes. The location of specific centroids will be reviewed.

2. Provide the third party vendor, if applicable, and a complete description of the process used to validate ZIP Code information.

3. The treatment of ZIP Code centroids over water or other uninhabitable terrain 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.

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*

*(*Significant Revision due to new Audit language)*

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 that the submission has been personally reviewed.

Purpose: This Standard requires that the modeler 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 modeler submission and certify that the submission is in compliance with the Acceptability Process.

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. Provide a completed Form G-7, Editorial Certification.

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, 2008*.

2. Describe all changes to the submission document since the prior year's submission that might impact the final document submission.

3. Demonstrate that the modeler submission has been reviewed for grammatical correctness, typographical accuracy, completeness, and inclusion of extraneous data or materials.

4. The modification history for submission documentation will be reviewed.

5. A flowchart defining the process for Form creation will be reviewed.

6. Form G-7 will be reviewed.

Form G-1: General Standards Expert Certification

I hereby certify that I have personally reviewed the submission of _____
(Name of Model)
Version _____ for compliance with the 2008 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, 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 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.

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 personally reviewed the submission of _____
(Name of Model)
Version _____ for compliance with the 2008 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 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.

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

Form G-3: Vulnerability Standards Expert Certification

I hereby certify that I have personally reviewed the submission of _____
(Name of Model)
Version _____ for compliance with the 2008 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) the model meets the Vulnerability Standards (V1 – V2),
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 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.

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

Form G-4: Actuarial Standards Expert Certification

I hereby certify that I have personally reviewed the submission of _____
(Name of Model)
Version _____ for compliance with the 2008 Standards adopted by the Florida Commission on Hurricane Loss Projection Methodology and hereby certify that:

1) the model meets the Actuarial Standards (A1 – A11),
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 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 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.

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

Form G-5: Statistical Standards Expert Certification

I hereby certify that I have personally reviewed the submission of _____
(Name of Model)
Version _____ for compliance with the 2008 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 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.

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 personally reviewed the submission of _____
(Name of Model)
Version _____ for compliance with the 2008 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 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.

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 personally reviewed the 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, 2008*, and hereby certify that:

1) the model submission is in compliance with the Commission's Notification Requirements and General Standard G-5,
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 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.

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 the model and model validation shall be based upon the National Hurricane Center HURDAT starting at 1900 as of June 1, 2008 (or later). Complete additional season increments based on updates to HURDAT 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. Validation and comparison shall encompass the complete Base Hurricane Storm Set as well as any partitions.

Purpose: The Base Hurricane Storm Set covers the period 1900-2007. The primary use of this Base Hurricane Storm Set is in checking modeled versus historical hurricanes impacting Florida. Failure to update the Base Hurricane Storm Set through the 2007 hurricane season is not acceptable.

The National Hurricane Center periodically updates the online version of HURDAT 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 HURDAT, a freeze date has been specified for the HURDAT version to be used. This freeze date represents the date HURDAT was downloaded from the website.

The Commission provided a multiple-year buffer for the transition between the previous Official Hurricane Set and the complete North Atlantic HURDAT. The phase-in of the National Hurricane Center HURDAT as the Base Hurricane Set is completed in the 2008 *Report of Activities* with the National Hurricane Center HURDAT valid June 1, 2008 that includes through the 2007 hurricane season.

Disclosures

1. Identify the Base Hurricane Storm Set, the release date, and the time period included to develop and implement landfall and by-passing storm frequencies into the model.

2. If the modeler 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.

Audit

1. The modeler's Base Hurricane Storm Set will be reviewed.

2. Reasoning and justification underlying any modification by the modeler to the Base Hurricane Storm Set will be reviewed.

3. Reasoning and justification underlying any short-term and long-term variations in annual storm frequencies incorporated in the model will be reviewed.

4. 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 hurricane frequencies for the four regions of Florida and overall as provided in Form M-1 will be reviewed.

5. Form M-1 will be reviewed for consistency with Form S-1.

6. 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, strike probabilities, 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 modeler use only scientifically sound information for determining hurricane parameters and characteristics. The stochastic storm set shall include only storms 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.

Disclosures

1. Identify the hurricane parameters (e.g., central pressure or radius of maximum winds) that are used in the model. Describe the historical data used for each of these parameters identifying all storms used.

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. For hurricane parameters modeled as random variables, describe the probability distributions. Identify any parameters that have fixed values and provide justification.

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 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.

6. Describe how the windspeeds generated in the windfield model are converted from sustained to gust and identify the averaging time.

7. Describe how the asymmetric structure of hurricanes is represented in the model.

8. 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 storm database.

9. If the historical data are partitioned or modified, describe how the hurricane parameters are affected.

10. 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.

11. 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:
    - the data set basis for the fitted distributions,
    - the modeled dependencies among correlated parameters in the windfield component and how they are represented,
    - the asymmetric nature of hurricanes,
    - the fitting methods used and any smoothing techniques employed.

3. The goodness-of-fit of distributions to historical data will be reviewed.

4. The treatment of uncertainties associated with the conversion of gradient winds to surface winds will be compared with currently accepted literature. Variation of the conversion factor with storm intensity will be reviewed.

5. All modeler cited scientific literature provided in Standard G-1 will be reviewed to determine applicability.

6. All external data sources that affect model generated windfields will be identified and their appropriateness will be reviewed.

7. Describe the value(s) of the far-field pressure used in the model and approximate its sensitivity on the average annual zero deductible statewide loss costs.

M-3 Hurricane Probabilities

A. Modeled probability distributions of hurricane parameters and characteristics shall be consistent with historical hurricanes in the Atlantic basin.

B. Modeled hurricane probabilities 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).

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.

Disclosures

1. List assumptions used in creating the hurricane characteristic databases.

2. List data sources used in developing probability distributions 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 modeler specific research performed to develop the functions used for simulating model variables or to develop databases.

M-4 Hurricane Windfield Structure

A. Windfields generated by the model shall be consistent with observed historical storms affecting Florida.

B. The translation of land use and land cover or other source information to geographic surface roughness distribution shall be consistent with current state-of-the-science.

Purpose: This Standard requires that the windfield model be implemented consistently with the land use and land cover distribution and that the resulting surface windfield be representative of historical storms in Florida and adjacent states.

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

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 the relevance of the formulation of gust factor(s) used in the model.

5. Identify all non-meteorological variables that affect windspeed estimation (e.g., surface roughness, topography, etc.).

6. Provide the collection and publication dates of the land use and land cover data used in the model and justify their timeliness for Florida.

7. Describe the methodology used to convert land use and land cover information into a spatial distribution of roughness coefficients in Florida and adjacent states.

8. Demonstrate the consistency of the spatial distribution of model-generated winds with observed windfields for hurricanes affecting Florida.

9. Describe how the model's windfield is consistent with the inherent differences in windfields for such diverse storms as Hurricane Charley (2004), Hurricane Katrina (2005), and Hurricane Wilma (2005).

10. Describe any variations in the treatment of the model windfield for stochastic versus historical storms and justify this variation.

11. Provide a completed Form M-2, Maps of Maximum Winds.

Audit

1. Provide any modeler-specific research performed to develop the windfield functions used in the model. Identify the databases used.

2. Provide any modeler-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. Identify other variables in the model that affect over-land surface windspeed estimation.

5. Provide detailed comparisons of the model windfield with Hurricane Charley (2004), Hurricane Katrina (2005), and Hurricane Wilma (2005).

6. For windfield and/or pressure distributions not previously reviewed, the modeler will present time-based contour animations (capable of being paused) to demonstrate scientifically reasonable windfield characteristics.

7. Form M-2 will be reviewed.

M-5 Landfall and Over-Land Weakening Methodologies

A. The magnitude of land friction coefficients shall incorporate current geographic surface roughness distributions and shall be implemented with appropriate geographic information system data.

B. The hurricane over-land weakening rate methodology used by the model shall be consistent with historical records.

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 strike probabilities 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 – 130	Extensive
4	131 – 155	Extreme
5	Over 155	Catastrophic

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 boundary coefficients. The land use and land cover database used by the model shall be consistent with the current data for Florida. The transition of winds from over-water to over-land within the model shall be consistent with windfield boundary layer dynamics.

Disclosures

1. Describe and justify the functional form of hurricane decay rates used by the model.

2. Provide a graphical representation of the modeled degradation rates for Florida hurricanes over time compared to wind observations. Reference to the Kaplan-DeMaria decay rates alone is not acceptable.

3. Describe the transition from over-water to over-land boundary layer simulated in the model.

4. Describe the representation in the model of passage over non-continental U.S. land masses on hurricanes affecting Florida.

5. Document any differences between 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. Transition of winds from over-water to over-land (i.e., landfall) will be reviewed.

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 modeler to demonstrate physical consistency of the model windfield.

Disclosure

1. Provide a completed Form M-3, Radius of Maximum Winds and Radii of Standard Wind Thresholds.

Audit

1. Form M-3 and the modeler's sensitivity analyses provide the information used in auditing this Standard.

2. Justify the relationship between central pressure and radius of maximum winds.

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 windspeed in the Saffir-Simpson scale) for the entire state of Florida and selected regions as defined in *Figure 3*. List the annual occurrence rate (probability of an event in a given year) per hurricane category. Annual occurrence rates shall be rounded to two decimal places. The historical frequencies below have been derived from the National Hurricane Center's HURDAT as of June 1, 2008, the latest re-analyses through 1920 that are included in HURDAT, and encompass the historical period 1900-2007 (108 years). Category classification was determined by wind intensity at landfall.

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, the modeler shall 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 Form M-1s.

E. Provide this Form on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form M-1 shall be included in the submission.

Modeled Annual Occurrence Rates

	Entire State				Region A – NW Florida			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	24	0.22			13	0.12		
2	12	0.11			5	0.05		
3	18	0.17			5	0.05		
4	8	0.07			0	0.00		
5	2	0.02			0	0.00		

	Region B – SW Florida				Region C – SE Florida			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	8	0.07			7	0.06		
2	2	0.02			5	0.05		
3	7	0.06			6	0.06		
4	3	0.03			5	0.05		
5	1	0.01			1	0.01		

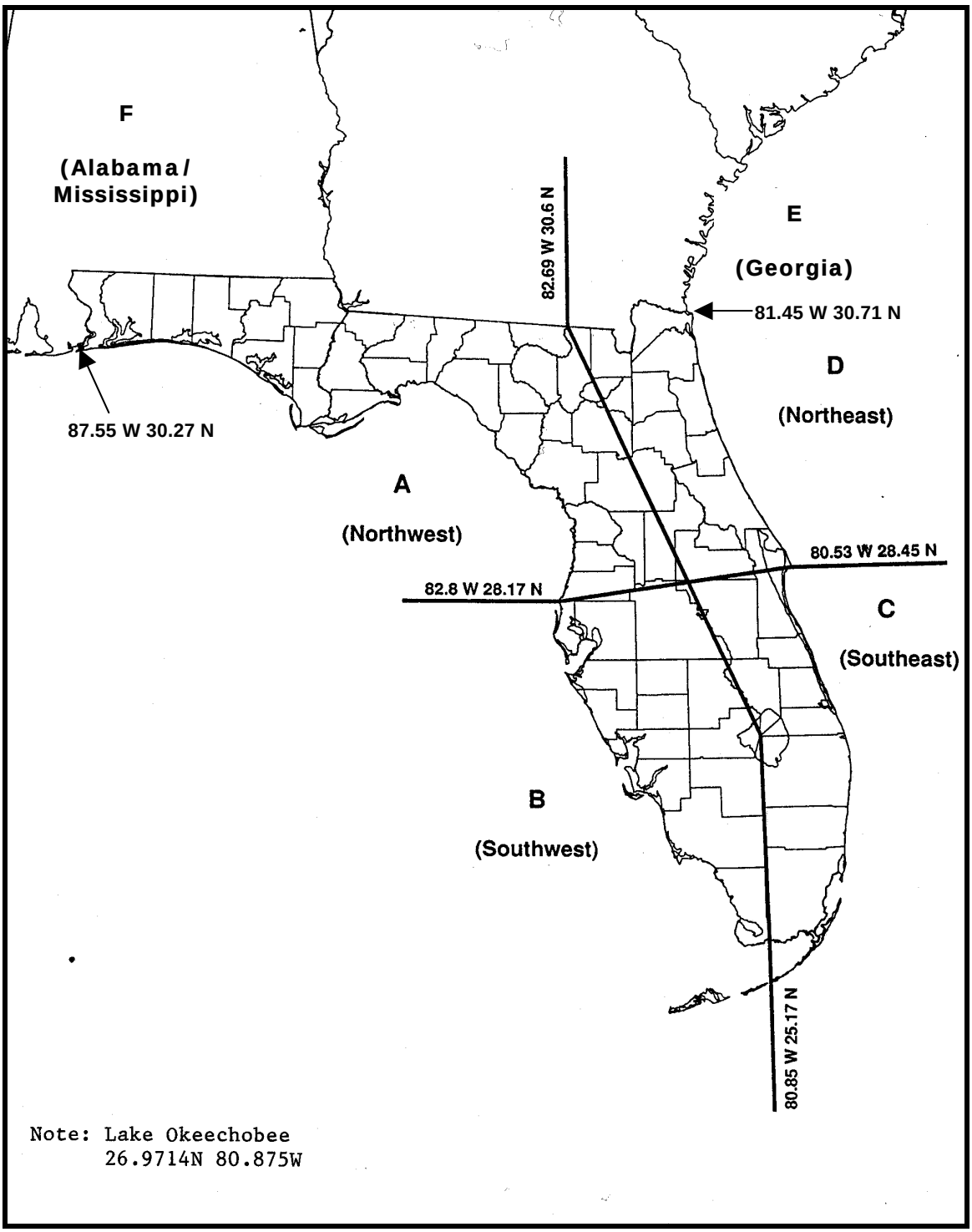
	Region D – NE Florida				Florida By-Passing Hurricanes			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	1	0.01			4	0.04		
2	2	0.02			7	0.06		
3	0	0.00			2	0.02		
4	0	0.00			0	0.00		
5	0	0.00			0	0.00		

	Region E – Georgia				Region F – Alabama/Mississippi			
	Historical		Modeled		Historical		Modeled	
Category	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1	3	0.03			7	0.06		
2	0	0.00			3	0.03		
3	0	0.00			5	0.05		
4	0	0.00			1	0.01		
5	0	0.00			1	0.01		

Note: Except where specified, Number of Hurricanes does not include By-Passing Storms. Each time a hurricane goes from water to land (once per region) it is counted as a landfall in the table above.

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 both open terrain and actual terrain.

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. Provide the maximum winds plotted on each contour map and plot their location.

"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 seven isotach values and interval color coding:

(1)	40 mph	Blue
(2)	75 mph	Medium Blue
(3)	95 mph	Light Blue
(4)	110 mph	Light Pink
(5)	130 mph	Pink
(6)	140 mph	Light Red
(7)	155 mph	Red

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 ranges for 1) the radius of maximum winds (Rmax) used by the model to create the stochastic storm set and ranges for the 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 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 on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form M-3 shall be included in the submission.

Central Pressure (mb)	Range of Rmax (mi)	Range of R (>110 mph) (mi)	Range of R (>73 mph) (mi)	Range of R (>40 mph) (mi)
900				
910				
920				
930				
940				
950				
960				
970				
980				
990				

VULNERABILITY STANDARDS

V-1 Derivation of Vulnerability Functions

A. Development of the vulnerability functions is to be based on a combination of the following: (1) historical data, (2) tests, (3) structural calculations, (4) expert opinion, or (5) site inspections. Any development of the vulnerability functions based on structural calculations or expert opinion shall be supported by tests, site inspections, and historical data.

B. The method of derivation of the vulnerability functions shall be theoretically sound.

C. Any modification factors/functions to the vulnerability functions or structural characteristics and their corresponding effects shall be clearly defined and be theoretically sound.

D. Construction type and construction characteristics shall be used in the derivation and application of vulnerability functions.

E. In the derivation and application of vulnerability functions, assumptions concerning building code revisions and building code enforcement shall be justified.

F. Vulnerability functions shall be separately derived for building structures, mobile homes, appurtenant structures, contents, and additional living expense.

G. The minimum windspeed that generates damage shall be reasonable.

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

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

The effects of building codes and their enforcement that affect the vulnerability functions shall be considered and be reasonably represented in the model.

Separate vulnerability functions are required for building structures, mobile homes, appurtenant structures, contents, and additional living expense.

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

Disclosures

1. Provide a flow chart documenting the process by which the vulnerability functions are derived and implemented.

2. Describe the nature and extent of actual insurance claims data used to develop the model's 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 lines, commercial, and mobile home.

3. Summarize site inspections, including the source, and provide a brief description of the resulting use of these data in development, validation, or verification of vulnerability functions.

4. Describe the research used in the development of the model's vulnerability functions.

5. Describe the number of categories of the different vulnerability functions. Specifically, include descriptions of the structure types, lines of business, and coverages in which a unique vulnerability function is used.

6. Describe the process by which local construction and building code criteria are considered in the model.

7. Identify the one-minute average sustained windspeed at which the model begins to estimate damage.

8. Describe how the duration of windspeeds at a particular location over the life of a hurricane is considered.

9. Provide a completed Form V-1, One Hypothetical Event.

Audit

1. 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. To the extent that historical data are used to develop vulnerability functions, demonstrate the goodness-of-fit of the data to fitted models. Complete reports detailing loading conditions and damage suffered are required for any test data used. Complete structural calculations shall be presented so that a variety of different structure types and construction characteristics may be selected for review. The basis for expert opinion and original site inspection reports shall be available for review.

2. Copies of any papers, reports, and studies used in the development of the vulnerability functions shall be available for review. Copies of all public record documents used may be requested for review.

3. Multiple samples of vulnerability functions for building structures, mobile homes, appurtenant structures, contents, and additional living expense shall be available. The magnitude of logical changes among these items for a given windspeed shall be explained and validation materials shall be available.

4. Justify the construction types and characteristics used, and provide validation of the range and direction of the variations in damage.

5. Document and justify all modifications to the 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).

6. Provide validation material for the disclosed minimum windspeed. Provide the computer code showing the inclusion of the minimum windspeed at which damage occurs.

7. The effects on building vulnerability from local construction characteristics and building codes will be reviewed.

8. Form V-1 will be reviewed.

V-2 Mitigation Measures

A. Modeling of mitigation measures to improve a structure's wind resistance and the corresponding effects on vulnerability shall be theoretically sound. These measures shall include fixtures or construction techniques that enhance:

- ***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 shall be empirically justified both individually and 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" 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, and skylight strength. Example: Impact resistant glazing.

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.

Disclosures

1. Provide a completed Form V-2, Mitigation Measures – Range of Changes in Damage.

2. Provide a description of the mitigation measures used by the model that are not listed in Form V-2.

3. Describe how mitigation is implemented in the model. Identify any assumptions.

Audit

1. Forms V-2 and V-3 provide the information used in auditing this Standard.

2. 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.

3. 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 336 ZIP Codes are provided in the file named ***"FormV1Input08.xls."*** The windspeeds and ZIP Codes represent a hypothetical hurricane track. The modeler is instructed to model the sample exposure data provided in the file named ***"FormA1Input08.xls"*** 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 exposure data provided consists of three structures (one of each construction type – wood frame, masonry, and mobile home) 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, or mobile home) 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 ALE.

Reference Frame Structure:	**Reference Masonry Structure:**
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	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
Reference Mobile Home Structure: Tie downs Single unit Manufactured in 1980	

B. Confirm that the structures used in completing the Form are identical to those in the above table. If additional non-structural assumptions are necessary to complete this Form (for example, regarding duration or surface roughness), the modeler shall 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, 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	_____

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

A. Provide the change in the zero deductible personal residential reference structure damage rate (not loss cost) for each individual mitigation measure listed in Form V-2 as well as for the combination of the four mitigation measures provided for the Mitigated Frame Structure and the Mitigated Masonry Structure below.

B. If additional assumptions are necessary to complete this Form (for example, regarding duration or surface roughness), the modeler shall provide the rationale for the assumptions as well as a detailed description of how they are included.

C. Provide this Form on CD in Excel format without truncation. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form V-2 shall be included in the submission.

Reference Frame Structure:	**Reference Masonry Structure:**
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	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
Mitigated Frame Structure:	**Mitigated Masonry Structure:**
Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters	Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters

Reference and mitigated structures are $100,000 fully insured structures with a zero deductible policy as indicated under "Owners" Policy Type for Form A-6.

Place the reference structure at the population centroid for ZIP Code 33921 located in Lee County.

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 STRUCTURE					MASONRY STRUCTURE				
			WINDSPEED (MPH)					WINDSPEED (MPH)				
			60	85	110	135	160	60	85	110	135	160
	REFERENCE STRUCTURE		—	—	—	—	—	—	—	—	—	—
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										

MITIGATION MEASURES IN COMBINATION		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE) * 100									
		FRAME STRUCTURE					MASONRY STRUCTURE				
		WINDSPEED (MPH)					WINDSPEED (MPH)				
		60	85	110	135	160	60	85	110	135	160
STRUCTURE											
	MITIGATED STRUCTURE										

Form V-3: Mitigation Measures – Mean Damage Ratio Trade Secret List Item

A. Provide the mean damage ratio (prior to any insurance considerations) to the reference structure for each individual mitigation measure listed in Form V-3 as well as the percent damage for the combination of the four mitigation measures provided for the Mitigated Frame Structure and the Mitigated Masonry Structure below.

B. If additional assumptions are necessary to complete this Form (for example, regarding duration or surface roughness), the modeler shall provide the rationale for the assumptions as well as a detailed description of how they are included.

C. Provide a graphical representation of the vulnerability curves for the reference structure and the fully mitigated structure.

Reference Frame Structure:	**Reference Masonry Structure:**
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	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
Mitigated Frame Structure:	**Mitigated Masonry Structure:**
Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters	Rated shingles (110mph) 8d nails, deck to roof members Truss straps at roof Plywood Shutters

Reference and mitigated structures are $100,000 fully insured structures with a zero deductible policy as indicated under "Owners" Policy Type for Form A-6.

Place the reference structure at the population centroid for ZIP Code 33921 located in Lee County.

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

Form V-3: Mitigation Measures – Mean Damage Ratio
Trade Secret List Item

INDIVIDUAL MITIGATION MEASURES			MEAN DAMAGE RATIO									
			FRAME STRUCTURE					MASONRY STRUCTURE				
			WINDSPEED (MPH)					WINDSPEED (MPH)				
			60	85	110	135	160	60	85	110	135	160
	REFERENCE STRUCTURE											
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										

MITIGATION MEASURES IN COMBINATION		MEAN DAMAGE RATIO									
		FRAME STRUCTURE					MASONRY STRUCTURE				
		WINDSPEED (MPH)					WINDSPEED (MPH)				
		60	85	110	135	160	60	85	110	135	160
STRUCTURE											
	MITIGATED STRUCTURE										

ACTUARIAL STANDARDS

A-1 Modeled Loss Costs and Probable Maximum Loss Levels*

*(*Significant Revision)*

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.

Purpose: Loss costs and probable maximum loss levels shall only include insured wind related damages 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.

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.

3. Describe how structures that have been weakened or destroyed by flood or hurricane storm surge are 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 Standard A-1.

2. The model will be reviewed to determine that by-passing storms and their effects are considered in a manner that is consistent with Standard A-1.

A-2 Underwriting Assumptions*

*(*Significant Revision)*

A. When used in the modeling process or for verification purposes, adjustments, edits, inclusions, or deletions to insurance company input data used by the modeler shall be based upon accepted actuarial, underwriting, and statistical procedures.

B. 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) claim payment practices, and (4) relevant underwriting practices underlying those losses, as well as any actuarial modifications, shall be appropriate.

Purpose: Insurance company data used in model development may include appropriate insurer or modeler adjustments that do not diminish the usefulness of the data.

Loss costs and probable maximum loss levels may be significantly impacted by the way in which insurers pay claims following a hurricane event. To appropriately use historical insurer claims data to verify modeled loss costs and probable maximum loss levels it is important that insurer claim practices are understood and that the effects of insurer claim practices on the loss costs and probable maximum loss levels are explained.

Disclosures

1. Identify the assumptions used to develop loss costs for unknown residential construction types.

2. Describe the assumptions included in model development and validation concerning insurance company claim payment practices.

3. 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.

4. 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.

5. Describe how loss adjustment expenses are considered within the loss cost and probable maximum loss level estimates.

Audit

1. Demonstrate how the claim practices of insurance companies are accounted for when claims data for those insurance companies are used to develop or to verify model calculations. For example, the level of damage the insurer considers a loss to be a "total loss" or claim practices of insurers with respect to concurrent causation.

A-3 Loss Cost Projections and Probable Maximum Loss Levels*

*(*Significant Revision)*

A. Loss cost projections and probable maximum loss levels produced by hurricane loss projection models 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 provision for direct hurricane storm surge losses.

Purpose: 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.

Disclosures

1. Describe the method or methods used to estimate annual loss costs and probable maximum loss levels needed for ratemaking. Identify any source documents used and research performed.

2. Identify the highest level of resolution for which loss costs can be provided. Identify the resolution used for the reported output ranges.

Audit

1. Describe how the model handles expenses, risk load, investment income, premium reserves, taxes, assessments, profit margin, and economic inflation.

A-4 Demand Surge*

*(*Significant Revision)*

A. Demand surge shall be included in the model's calculation of loss costs and probable maximum loss levels using relevant data.

B. The methods, data, and assumptions used in the estimation of demand surge shall be actuarially sound.

Purpose: Demand surge is recognized as an important element for modeling and due to recent storms there are sufficient data for this Standard to be met.

Disclosures

1. Describe how the model incorporates demand surge in the calculation of loss costs and probable maximum loss levels.

2. Provide citations to published papers, if any, that were used to develop how the model estimates demand surge.

Audit

1. Provide the data and methods used to incorporate individual aspects of demand surge on each coverage type, inclusive of the effects from building material costs, labor costs, contents costs, repair time, etc.

2. All referenced literature will be reviewed to determine applicability.

A-5 User Inputs

All modifications, adjustments, assumptions, and defaults necessary to use the inputs in the model shall be actuarially sound and included with the model output. Treatment of missing values for user inputs required to run the model shall be actuarially sound and described with the model output.

Purpose: Hurricane loss projection models may rely on certain insurer assumptions. Implicit assumptions may or may not be appropriate for use by a given insurer, depending on the circumstances.

Disclosures

1. Describe the methods used to distinguish among policy form types (e.g., homeowners, dwelling property, mobile home, tenants, condo unit owners).

2. Disclose, in a model output report, the specific type of input that is required to use the model or model output in a personal 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 implementing the model. Include the model name and version number on the model output report. All items included in the output form submitted to the Commission shall be clearly labeled and defined.

3. Provide a copy of the input form used by a model user to provide input criteria to be used in the model. The modeler shall demonstrate that the input form relates directly to the model output. Include the model name and version number on the input form. All items included in the input form submitted to the Commission shall be clearly labeled and defined.

4. 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 insurer inputs and assumptions will be reviewed.

A-6 Logical Relationship to Risk*

*(*Significant Revision due to new Form)*

A. 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.

B. Loss costs produced by the model shall be positive and non-zero for all valid Florida ZIP Codes.

C. Loss costs cannot increase as the quality of construction type, materials and workmanship increases, all other factors held constant.

D. Loss costs cannot increase as the presence of fixtures or construction techniques designed for hazard mitigation increases, all other factors held constant.

E. Loss costs cannot increase as the quality of building codes and enforcement increases, all other factors held constant.

F. Loss costs shall decrease as deductibles increase, all other factors held constant.

G. The relationship of loss costs for individual coverages, (e.g., structures and appurtenant structures, contents, and loss of use/additional living expense) shall be consistent with the coverages provided.

Purpose: Modeled loss costs shall vary according to risk. If the risk of loss due to hurricanes is higher for one area or structure 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.

Disclosures

1. Demonstrate that loss cost relationships by type of coverage (structures, appurtenant structures, contents, additional living expenses) are consistent with actual insurance data.

2. Demonstrate that loss cost relationships by construction type or vulnerability function (frame, masonry, and mobile home) are consistent with actual insurance data.

3. Demonstrate that loss cost relationships among coverages, territories, and regions are consistent and reasonable.

4. Explain any anomalies or special circumstances that might preclude any of the above conditions from occurring.

5. Provide a completed Form A-1, Loss Costs.

6. Provide a completed Form A-2, Zero Deductible Loss Costs by ZIP Code.

7. Provide a completed Form A-3, Base Hurricane Storm Set Statewide Loss Costs.

8. Provide a completed Form A-4, Hurricane Andrew (1992) Percent of Losses.

9. Provide a completed Form A-5, Cumulative Losses from the 2004 Hurricane Season.

Audit

1. Graphical representations of loss costs by ZIP Code and county will be reviewed.

2. Color-coded maps depicting the effects of land friction on loss costs by ZIP Code will be reviewed.

3. Individual loss cost relationships will be reviewed. Forms A-1, A-2, A-3, A-4, and A-5 will be used to assess coverage relationships.

A-7 Deductibles and Policy Limits

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 structure 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.

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)
Structure 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. The actuary for the modeler may be asked to attest to the actuarial soundness of the procedure for handling deductibles and policy limits.

3. To the extent that historical data are used to develop mathematical depictions of deductibles and policy limit functions, demonstrate the goodness-of-fit of the data to fitted models.

4. Justify changes from the prior submission in the relativities among corresponding deductible amounts for the same coverage.

A-8 Contents

A. The methods used in the development of contents loss costs shall be actuarially sound.

B. The relationship between the modeled structure and contents loss costs shall be reasonable, based on the relationship between historical structure and contents losses.

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

Disclosure

1. Describe the methods used in the model to calculate loss costs for contents coverage associated with personal residential structures (including mobile homes), tenants, and condo unit owners.

Audit

1. The actuary for the modeler may be asked to attest to the actuarial soundness of the procedure for calculating loss costs for contents coverage.

2. To the extent that historical data are used to develop mathematical depictions of contents functions, demonstrate the goodness-of-fit of the data to fitted models.

3. Justify changes from the prior submission in the relativities between loss costs for structures and the corresponding loss costs for contents.

A-9 Additional Living Expense (ALE)

A. The methods used in the development of ALE loss costs shall be actuarially sound.

B. ALE loss cost derivations shall consider the estimated time required to repair or replace the property.

C. The relationship between the modeled structure and ALE loss costs shall be reasonable, based on the relationship between historical structure and ALE losses.

D. ALE loss costs produced by the model shall appropriately consider ALE claims arising from damage to the infrastructure.

Purpose: Policies can cover varying levels of ALE. The time factor to repair/reconstruct the property shall include variation due to abnormal working conditions or damage to the infrastructure.

Disclosures

1. Describe the methods used to develop loss costs for ALE coverage. State whether the model considers both direct and indirect loss to the structure. For example, direct loss is for expenses paid to house policyholders in an apartment while their home is being repaired. Indirect loss is for expenses incurred for loss of power (e.g., food spoilage).

2. State the minimum threshold at which ALE loss is calculated (e.g., loss is estimated for structure damage greater than 20% or only for category 3, 4, 5 events). Provide documentation of validation test results to verify the approach used.

3. Describe how modeled ALE loss costs take into consideration the degree of storm surge and flood damage to local and regional infrastructure.

Audit

1. The actuary for the modeler may be asked to attest to the actuarial soundness of the procedure for calculating loss costs for ALE coverage. Documentation and justification of the following will be reviewed:

    a. The method of derivation and data on which the ALE vulnerability function is based;

    b. Validation data specifically applicable to ALE;

    c. Assumptions regarding the coding of ALE losses by insurers;

    d. The effects of demand surge on ALE for Hurricane Andrew (1992);

e. Assumptions regarding the variability of ALE by size of property;

f. Statewide application of ALE assumptions;

g. Assumptions regarding ALE 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 ALE costs.

2. To the extent that historical data are used to develop mathematical depictions of ALE functions, demonstrate the goodness-of-fit of the data to fitted models.

3. Justify the differences in the relationship of structure and ALE loss costs from those previously found acceptable.

A-10 Output Ranges

A. Output ranges shall be logical and any deviations supported.

B. All other factors held constant, output ranges produced by the model shall reflect lower loss costs for:

1. masonry construction versus frame construction,

2. residential risk exposure versus mobile home risk exposure,

3. in general, inland counties versus coastal counties, and

4. in general, northern counties versus southern counties.

Purpose: 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.

Disclosures

1. Provide an explanation for all anomalies in the loss costs that are not consistent with the requirements of this Standard.

2. Provide an explanation of the differences in the output ranges using the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data between the prior year and the current year submission.

3. Provide a completed Form A-6, Output Ranges using the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data.

4. Provide a completed Form A-7, Percentage Change in Output Ranges using the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data.

5. Provide a completed Form A-8, Percentage Change in Output Ranges by County using the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data.

Audit

1. Forms A-6, A-7, and A-8 will be reviewed.

2. The modeler will be required to justify all changes from the prior submission using the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data.

3. Output ranges will be reviewed to ensure appropriate differentials among deductibles, coverage, and construction types.

4. Anomalies in the output range data will be reviewed and shall be justified.

A-11 Probable Maximum Loss*

*(*New Standard)*

The methods, data, and assumptions used in the estimation of probable maximum loss levels shall be actuarially sound.

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.

Disclosures

1. Describe how the model produces probable maximum loss levels.

2. Provide citations to published papers, if any that were used to estimate probable maximum loss levels.

3. Provide a completed Form A-9, Probable Maximum Loss for Florida.

Audit

1. Provide the data and methods used for probable maximum loss levels for Form A-9.

2. All referenced literature will be reviewed to determine applicability.

3. The actuary for the modeler may be asked to attest to the actuarial soundness of the procedures used for calculating probable maximum loss levels.

Form A-1: Loss Costs

A. Provide the expected annual loss costs by construction type and coverage for each ZIP Code in the sample data set named ***"FormA1Input08.xls."*** Loss costs shall be rounded to six decimal places. There are 1,479 ZIP Codes and three construction types; therefore, the completed file should have 4,437 records in total. The following is a description of the requested file layout. Follow the instructions on Form A-1 below and in the Submission Data description. Note that fields 2-9 are the exposure fields from the sample data set. Fields 10-13 are for the loss costs (net of deductibles).

B. If there are ZIP Codes in the sample data set that the model does not recognize as "valid," provide a list in the submission document of such ZIP Codes and provide either a) the new ZIP Code to which the original one was mapped, or b) an indication that the insured values from this ZIP Code were not modeled.

   Loss cost data shall be provided for all ZIP Codes given in the sample data set. That is, if no losses were modeled, the record should still be included in the completed file with loss cost of zero, and if a ZIP Code was mapped to a new one, the resulting loss costs should be reported with the original ZIP Code.

C. Provide the results on CD in Excel and PDF format using the following file layout. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name.

No.	Field Name	Description
1	Analysis Date	Date of Analysis – YYYY/MM/DD
Exposure Fields from Sample Data Set		
2	County Code	FIPS County Code
3	ZIP Code	5-digit ZIP Code
4	Construction Type	1 = Wood Frame, 2 = Masonry, 3 = Mobile Home
5	Annual Deductible	2% (of the Structure Value) policy deductible for each record (i.e., 0.02*$100,000)
6	Structure Value	$100,000 for each record
7	Appurtenant Structures Value	$10,000 for each record
8	Contents Value	$50,000 for each record
9	Additional Living Expense Value	$20,000 for each record
Loss Costs (net of deductibles)		
10	Structure Loss Cost	Projected expected annual loss cost for structure divided by the structure value modeled for each record ($100,000)
11	Appurtenant Structures Loss Cost	Projected expected annual loss cost for appurtenant structures divided by the appurtenant structures value modeled for each record ($10,000)
12	Contents Loss Cost	Projected expected annual loss cost for contents divided by the contents value modeled for each record ($50,000)
13	Additional Living Expense Loss Cost	Projected expected annual loss cost for additional living expense divided by the additional living expense value modeled for each record ($20,000)

All deductibles are a percentage of the Structure Value and are policy-level deductibles; however, for reporting purposes, the policy deductible shall be pro-rated to the individual coverage losses in proportion to the loss. The default all-other perils deductible is $500.

Example

Assume that a model analyzing Wood Frame properties in ZIP Code 33102 (Miami-Dade County) estimated the following:

Field Name	Value
Analysis Date	1999/11/15
County Code	Miami-Dade County = 86
ZIP Code	33102
Construction Type	Wood Frame = 1
Annual Deductible	2% = 0.02*$100,000 = $2,000
Structure Value	$100,000
Appurtenant Structures Value	$10,000
Contents Value	$50,000
Additional Living Expense Value	$20,000
Structure Loss Cost*	$10,000
Appurtenant Structures Loss Cost*	$1,000
Contents Loss Cost*	$2,500
Additional Living Expense Loss Cost*	$500

**Represents first dollar losses (i.e., prior to application of deductibles)*

The $2,000 hurricane deductible would be applied as follows:

Annual Deductible	2% = 0.02*$100,000=$2,000
Structure Loss Cost	$10,000-[($10,000÷$14,000)x$2,000]=$8,571.43
Appurtenant Structures Loss Cost	$1,000-[($1,000÷$14,000)x$2,000]=$857.14
Contents Loss Cost	$2,500-[($2,500÷$14,000)x$2,000]=$2,142.86
Additional Living Expense Loss Cost	$500-[($500÷$14,000)x$2,000]=$428.57

The reported Form A-1 data are shown below:

Field Name	Value
Analysis Date	1999/11/15
County Code	Miami-Dade County = 86
ZIP Code	33102
Construction Type	Wood Frame = 1
Annual Deductible	2% = 0.02
Structure Value	$100,000
Appurtenant Structures Value	$10,000
Contents Value	$50,000
Additional Living Expense Value	$20,000
Structure Loss Cost	$8,571.43÷$100,000 = 0.085714
Appurtenant Structures Loss Cost	$857.14÷$10,000 = 0.085714
Contents Loss Cost	$2,142.86÷$50,000 = 0.042857
Additional Living Expense Loss Cost	$428.57÷$20,000 = 0.021429

Based on the above information, the data shall be reported in the following format:

1999/11/15,86,33102,1,0.02,100000,10000,50000,20000,0.085714,0.085714,0.042857,0.021429

Form A-2: Zero Deductible Loss Costs by ZIP Code

Provide a map color-coded by ZIP Code (with a minimum of 6 value ranges) displaying zero deductible loss costs for frame, masonry, and mobile home.

Form A-3: Base Hurricane Storm Set Statewide Loss Costs

A. Provide the total insured loss and the dollar contribution to the average annual loss assuming all personal residential zero deductible policies from each specific hurricane in the Base Hurricane Storm Set for the 2007 Florida Hurricane Catastrophe Fund's aggregate exposure data found in the file named ***"hlpm2007.exe."*** Additional storms that are included in the model's Base Hurricane Storm Set should be included.

B. Provide this Form on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form A-3 shall be included in the submission.

Landfall/Closest Approach Date	Year	Name	Total Insured Losses ($)	Dollar Contribution
08/15/1901	1901	NoName 4-1901		
09/12/1903	1903	NoName 3-1903		
10/17/1904	1904	NoName 3-1904		
06/18/1906	1906	NoName 2-1906		
09/27/1906	1906	NoName 6-1906		
10/17/1906	1906	NoName 8-1906		
10/11/1909	1909	NoName 10-1909		
10/17/1910	1910	NoName 5-1910		
08/12/1911	1911	NoName 2-1911		
09/14/1912	1912	NoName 4-1912		
08/01/1915	1915	NoName 1-1915		
09/04/1915	1915	NoName 4-1915		
07/06/1916	1916	NoName 2-1916		
10/18/1916	1916	NoName 14-1916		
09/29/1917	1917	NoName 4-1917		
09/10/1919	1919	NoName 2-1919		
10/25/1921	1921	NoName 6-1921		
09/15/1924	1924	NoName 4-1924		
10/21/1924	1924	NoName 7-1924		
12/01/1925	1925	NoName 2-1925		
07/28/1926	1926	NoName 1-1926		
09/18/1926	1926	NoName 6-1926		
08/08/1928	1928	NoName 1-1928		
09/17/1928	1928	NoName 4-1928		
09/28/1929	1929	NoName 2-1929		
09/01/1932	1932	NoName 3-1932		
07/30/1933	1933	NoName 5-1933		
09/04/1933	1933	NoName 12-1933		
09/03/1935	1935	NoName 2-1935		
11/04/1935	1935	NoName 6-1935		
07/31/1936	1936	NoName 5-1936		
08/11/1939	1939	NoName 2-1939		
10/06/1941	1941	NoName 5-1941		
10/19/1944	1944	NoName 11-1944		
06/24/1945	1945	NoName 1-1945		

Landfall/Closest Approach Date	Year	Name	Total Insured Losses ($)	Dollar Contribution
09/16/1945	1945	NoName 9-1945		
10/08/1946	1946	NoName 5-1946		
09/17/1947	1947	NoName 4-1947		
10/12/1947	1947	NoName 8-1947		
09/22/1948	1948	NoName 7-1948		
10/05/1948	1948	NoName 8-1948		
08/27/1949	1949	NoName 2-1949		
08/31/1950	1950	Baker-1950		
09/05/1950	1950	Easy-1950		
10/18/1950	1950	King-1950		
09/26/1953	1953	Florence-1953		
09/25/1956	1956	Flossy-1956		
09/10/1960	1960	Donna-1960		
08/27/1964	1964	Cleo-1964		
09/10/1964	1964	Dora-1964		
10/14/1964	1964	Isbell-1964		
09/08/1965	1965	Betsy-1965		
06/09/1966	1966	Alma-1966		
10/04/1966	1966	Inez-1966		
10/19/1968	1968	Gladys-1968		
06/19/1972	1972	Agnes-1972		
09/23/1975	1975	Eloise-1975		
09/04/1979	1979	David-1979		
09/13/1979	1979	Frederic-1979		
09/02/1985	1985	Elena-1985		
11/21/1985	1985	Kate-1985		
10/21/1987	1987	Floyd-1987		
08/24/1992	1992	Andrew-1992		
08/02/1995	1995	Erin-1995		
10/04/1995	1995	Opal-1995		
07/19/1997	1997	Danny-1997		
09/03/1998	1998	Earl-1998		
09/28/1998	1998	Georges-1998		
10/15/1999	1999	Irene-1999		
08/13/2004	2004	Charley-2004		
09/05/2004	2004	Frances-2004		
09/16/2004	2004	Ivan-2004		
09/26/2004	2004	Jeanne-2004		
0710/2005	2005	Dennis-2005		
08/26/2005	2005	Katrina-2005		
09/21/2005	2005	Rita-2005		
10/24/2005	2005	Wilma-2005		
			Total	

Note: Total dollar contribution should agree with the total average annual zero deductible statewide loss costs provided in Form S-5 for current year.

Form A-4: Hurricane Andrew (1992) Percent of Losses

A. Provide the percentage of personal residential zero deductible losses, rounded to four decimal places, from Hurricane Andrew (1992) for each affected ZIP Code. Include all ZIP Codes where losses are equal to or greater than $500,000.

B. Provide a map color-coded by ZIP Code depicting the percentage of total losses from Hurricane Andrew (1992) below latitude 27°N 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%

C. Provide this Form on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form A-4 shall be included in the submission.

Rather than using directly a published windfield for Hurricane Andrew (1992), the winds underlying the loss cost calculations must be produced by the model being evaluated and should be the same storm parameters as used in completing Form A-3. Use the 2007 Florida Hurricane Catastrophe Fund's aggregate exposure data found in the file named ***"hlpm2007.exe."***

ZIP Code	Monetary Contribution ($)	Percent of Losses (%)

Form A-5: Cumulative Losses from the 2004 Hurricane Season

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

B. Provide maps color-coded by ZIP Code depicting the percentage of total 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%

C. Provide this Form on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form A-5 shall be included in the submission.

Rather than using directly published windfields for the 2004 Hurricane Season storms, the winds underlying the loss cost calculations must be produced by the model being evaluated and should be the same storm parameters as used in completing Form A-3. Use the 2007 Florida Hurricane Catastrophe Fund's aggregate exposure data found in the file named ***"hlpm2007.exe."***

ZIP Code	Monetary Contribution ($)	Percent of Losses (%)

Form A-6: Output Ranges

A. Provide output ranges in the format shown in the file named ***"2008FormA6.xls"*** by using an automated program or script. A hard copy of the output range spreadsheets shall be included in the submission. Provide the output ranges on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name.

B. Provide loss costs by county. Within each county, loss costs shall be shown separately per $1,000 of exposure for personal residential, tenants, condo unit owners, and mobile home; for each major deductible option; and by construction type. 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 based on the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data provided in the file named ***"hlpm2007.exe."*** A file named ***"07FHCFWts.xls"*** has also been provided for use in determining the weighted average loss costs. Include the statewide range of loss costs (i.e., low, high, and weighted average). For each of the loss costs provided, identify what that loss cost represents by line of business, deductible option, construction type, and coverages included, i.e., structure, contents, appurtenant structures, or additional living expenses as specified.

C. If a modeler has loss costs for a ZIP Code for which there is no exposure, then the modeler shall 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 the modeler does not have loss costs for a ZIP Code for which there is some exposure, the modeler shall not assume such loss costs are zero, but shall use only the exposures for which it has 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-10 and have been explained in Disclosure A-10.1 shall be shaded.

Modelers shall indicate if per diem is used in producing loss costs for Coverage D (ALE) in the 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
"Owners" Policy Type

Coverage A: Structure

- Amount of Insurance = $100,000
- Replacement Cost Included Subject to Coverage "A" Limit
- Ordinance or Law Not Included

Coverage B: Appurtenant Structures

- Amount of Insurance = 10% of Coverage "A" Amount
- Replacement Cost Included Subject to Coverage "B" Limit
- Ordinance or Law Not Included

Coverage C: Contents

- Amount of Insurance = 50% of Coverage "A" Amount
- Replacement Cost Included Subject to Coverage "C" Limit

Coverage D: Additional Living Expense

- Amount of Insurance = 20% of Coverage "A" Amount
- 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" amount.

- For weighting the Coverage "D" loss costs, use the file named ***"07FHCFWts.xls"*** for distribution for Coverage "D."

- Loss costs for the various deductibles shall be determined based on annual deductibles.

- All-other perils deductible shall be $500.

- Explain any deviations and differences from the prescribed format above.

- Specify the model name and version number reflecting the release date as a footnote on each page of the output.

Output Range Specifications
"Tenants" Policy Type

Coverage C: Contents

- Amount of Insurance = $25,000
- Replacement Cost Included Subject to Coverage "C" Limit

Coverage D: Additional Living Expense

- Amount of Insurance = 40% of Coverage "C" Amount
- 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" amount.

- For weighting the Coverage "D" loss costs, use the file named ***"07FHCFWts.xls"*** for distribution for Coverage "D."

- Loss costs for the various deductibles shall be determined based on annual deductibles.

- All-other perils deductible shall be $500.

- For weighting the Coverage "C" loss costs, use the file named ***"07FHCFWts.xls"*** for distribution for Coverage "C."

- Explain any deviations and differences from the prescribed format above.

- Specify the model name and version number reflecting the release date as a footnote on each page of the output.

Output Range Specifications
"Condo Unit Owners" Policy Type

Coverage A: Structure

- Amount of Insurance = 10% of Coverage "C" Amount
- Replacement Cost Included Subject to Coverage "A" Limit

Coverage C: Contents

- Amount of Insurance = $50,000
- Replacement Cost Included Subject to Coverage "C" Limit

Coverage D: Additional Living Expense

- Amount of Insurance = 40% of Coverage "C" Amount
- 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" amount.

- For weighting the Coverage "D" loss costs, use the file named ***"07FHCFWts.xls"*** for distribution for Coverage "D."

- Loss costs for the various deductibles shall be determined based on annual deductibles.

- All-other perils deductible shall be $500.

- For weighting the Coverage "C" loss costs, use the file named ***"07FHCFWts.xls"*** for distribution for Coverage "C."

- Explain any deviations and differences from the prescribed format above.

- Specify the model name and version number reflecting the release date as a footnote on each page of the output.

Output Range Specifications
"Mobile Home Owners" Policy Type

Coverage A: Structure

- Amount of Insurance = $50,000
- Replacement Cost Included Subject to Coverage "A" Limit

Coverage B: Appurtenant Structures

- Amount of Insurance = 10% of Coverage "A" Amount
- Replacement Cost Included Subject to Coverage "B" Limit

Coverage C: Contents

- Amount of Insurance = 50% of Coverage "A" Amount
- Replacement Cost Included Subject to Coverage "C" Limit

Coverage D: Additional Living Expense

- Amount of Insurance = 20% of Coverage "A" Amount
- 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" amount.

- For weighting the Coverage "D" loss costs, use the file named ***"07FHCFWts.xls"*** for distribution for Coverage "D."

- Loss costs for the various deductibles shall be determined based on annual deductibles.

- All-other perils deductible shall be $500.

- Explain any deviations and differences from the prescribed format above.

- Specify the model name and version number reflecting the release date as a footnote on each page of the output.

Form A-7: Percentage Change In Output Ranges

A. Provide the percentage change in the weighted average loss costs using the 2007 Florida Hurricane Catastrophe Fund's aggregate personal residential exposure data found in the file named ***"hlpm2007.exe"*** from the output ranges from the prior year submission for the following:
   - statewide (overall percentage change),
   - by region, as defined in *Figure 4* – North, Central and South,
   - by counties, as defined in *Figure 5* – Coastal and Inland.

B. Provide this Form on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form A-7 shall be included in the submission.

Figure 4

State of Florida by North/Central/South Regions

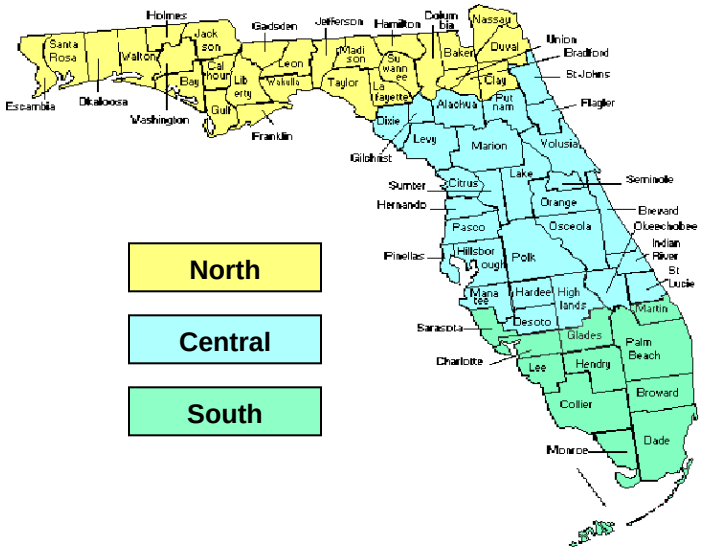
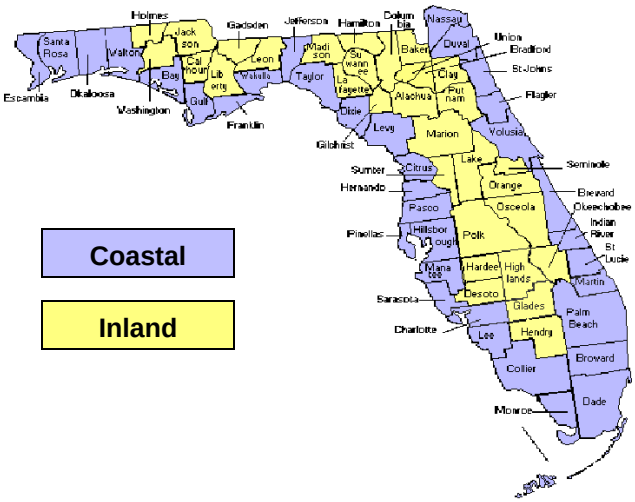


Figure 5

State of Florida by Coastal/Inland Counties



Form A-7: Percentage Change In Output Ranges

		$0 Deductible									
		Structure	Contents	Appurtenant Structure	Additional Living Expense	$500 Deductible Total	$1,000 Deductible Total	$2,500 Deductible Total	1% Deductible Total	2% Deductible Total	5% Deductible Total
Frame Owners	Coastal										
	Inland										
	North										
	Central										
	South										
	Statewide										
Masonry Owners	Coastal										
	Inland										
	North										
	Central										
	South										
	Statewide										
Mobile Homes	Coastal										
	Inland										
	North										
	Central										
	South										
	Statewide										
Frame Renters	Coastal										
	Inland										
	North										
	Central										
	South										
	Statewide										
Masonry Renters	Coastal										
	Inland										
	North										
	Central										
	South										
	Statewide										
Frame Condos	Coastal										
	Inland										
	North										
	Central										
	South										
	Statewide										
Masonry Condos	Coastal										
	Inland										
	North										
	Central										
	South										
	Statewide										

Form A-8: Percentage Change in Output Ranges by County

Provide color-coded maps by county reflecting the percentage changes in the weighted average 2% deductible loss costs for frame owners, masonry owners, mobile homes, frame renters, masonry renters, frame condos, and masonry condos from the output ranges using the 2007 Florida Hurricane Catastrophe Fund's aggregate personal residential exposure data found in the file named ***"hlpm2007.exe."***

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.

Form A-9: Probable Maximum Loss for Florida

A. Provide a detailed explanation of how the Expected Annual Hurricane Losses and Return Periods are calculated.

B. Complete Form A-9, Part A showing the probable maximum loss for Florida. For the Expected Annual Hurricane Losses column, provide personal residential, zero deductible statewide loss costs based on the 2007 Florida Hurricane Catastrophe Fund's aggregate exposure data found in the file named ***"hlpm2007.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 Return Periods to the prior year's submission Return Periods. 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 prior year.

D. Provide the estimated loss for each of the Return Periods given in Part B. Describe how the uncertainty intervals were derived.

E. Provide this Form on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name. A hard copy of Form A-9 shall be included in the submission.

Form A-9: Probable Maximum Loss for Florida

Part A

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					
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$ 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 residential zero deductible statewide loss using 2007 FHCF exposure data – file name: *hlpm2007.exe*.

Part B

Return Period (Years)	Estimated Loss Level	Uncertainty Interval
Top Event		
1,000		
500		
250		
100		
50		
20		
10		
5		

STATISTICAL STANDARDS

S-1 Modeled Results and Goodness-of-Fit*

*(*Significant Revision due to new Form and Audit language)*

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 agreement using currently accepted scientific and statistical methods in the appropriate disciplines.

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 modelers 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 modeler in advance of an audit (which could have the desirable effect in a self-audit of identifying potential problem areas).

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.

2. Provide the source and the number of years of the historical data set used to develop probability distributions for specific hurricane characteristics. If any modifications have been made to the data set, describe them in detail and their appropriateness.

3. Describe the nature and results of the tests performed to validate the windspeeds generated.

4. Provide the date of loss of the insurance company data available for validation and verification of the model.

5. Provide an assessment of uncertainty in loss costs for output ranges using confidence intervals or other accepted scientific characterizations of uncertainty.

6. Justify any differences between the historical and modeled results using current accepted scientific and statistical methods in the appropriate disciplines.

7. Provide graphical comparisons of modeled and historical data and goodness-of-fit tests. Examples include hurricane frequencies, tracks, intensities, and physical damage.

8. Provide a completed Form S-1, Probability and Frequency of Florida Landfalling Hurricanes per Year.

9. Provide a completed Form S-2, An Example of Loss Exceedance Estimates Based on a Limited Hypothetical Data Set.

Audit

1. Forms S-1, S-2, and S-3 will be reviewed. Provide justification for the distributions selected including, for example, citations to published literature or analyses of specific historical data.

2. The modeler's characterization of uncertainty for windspeed, damage estimates, annual loss, and loss costs will be reviewed.

S-2 Sensitivity Analysis for Model Output

The modeler 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 modelers 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 for the modelers and provides needed assurance of the robustness and viability of the model output.

Disclosures

1. Provide a detailed explanation of the sensitivity analyses that have been performed on the model above and beyond those completed for the original submission of Form S-6 and provide specific results. (Requirement for modeling organizations that have previously provided the Commission with Form S-6. This Disclosure can be satisfied with an updated Form S-6 that incorporates changes to the model since the previous submission of the Form.)

2. Provide a description of the statistical methods used to perform the sensitivity analysis.

3. 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.

4. 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.

5. Describe actions taken in light of the sensitivity analyses performed.

6. 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).

Audit

1. The modeler'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 will be reviewed for models submitted by modeling organizations which have not previously provided the Commission with this analysis.

S-3 Uncertainty Analysis for Model Output

The modeler 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: Modelers 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 for the modelers and provides needed assurance of the robustness and viability of the model output.

Disclosures

1. Provide a detailed explanation of the uncertainty analyses that have been performed on the model above and beyond those completed for the original submission of Form S-6 and provide specific results. (Requirement for modeling organizations that have previously provided the Commission with Form S-6. This Disclosure can be satisfied with an updated Form S-6 that incorporates changes to the model since the previous submission of the Form.)

2. Provide a description of the statistical methods used to perform the uncertainty analysis.

3. 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.

4. 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.

5. Describe actions taken in light of the uncertainty analyses performed.

6. For models submitted by modeling organizations, which have not previously provided this analysis to the Commission, Form S-6 was disclosed under Standard S-2 and will be used in the verification of Standard S-3.

Audit

1. The modeler'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 will be reviewed for models submitted by modeling organizations which have not previously provided the Commission with this analysis.

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.

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 modeler. This Standard applies separately to personal residential and, to the extent data are available, to mobile homes. 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.

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.

Disclosures

1. Describe the nature and results of the analyses performed to validate the loss projections generated by the model. Include analyses for the 2004 hurricane season.

2. Provide a completed Form S-4, Five Validation Comparisons.

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) Condominiums
   (5) Structures only
   (6) 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 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.

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.

Audit

1. Form S-5 will be reviewed.

2. Justify the following:

    a. Meteorological parameters,

    b. The effect of by-passing storms,

    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 National Hurricane Center's HURDAT as of June 1, 2008, the latest re-analyses through 1920 that are included in HURDAT, and encompass the historical period 1900-2007 (108 years). If another version of the National Hurricane Center's HURDAT or other hurricanes as specified in Standard M-1 are used by the modeler, then the historical probabilities and frequencies shall be modified accordingly and the HURDAT revision date provided.

If the data are partitioned or modified, the modeler shall 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 Form S-1s.

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	0.5833		63	
1	0.2593		28	
2	0.1296		14	
3	0.0278		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-2: An Example of Loss Exceedance Estimates Based on a Limited Hypothetical Data Set

Provide projections of the insured loss for various probability levels using the hypothetical data set provided in the file named ***"FormA1Input08.xls"*** and using the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data set provided in the file named ***"hlpm2007.exe."*** Provide the total average annual loss for the loss exceedance distribution using each data set. If the methodology of your model does not allow you to produce a viable answer, please state so and why.

Part A

Return Period (years)	Probability of Exceedance	Estimated Loss Hypothetical Data Set	Estimated 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-3: Distributions of Stochastic Hurricane Parameters

Provide the probability distribution functional form used for each stochastic hurricane parameter in the model. Provide a summary of the rationale for each functional form selected for each general classification.

Stochastic Hurricane Parameter (Function or Variable)	Functional Form of Distribution	Rationale

Form S-4: Five Validation Comparisons

A. Provide five validation comparisons of actual 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 scatter plot(s) of modeled vs. historical losses for each of the five 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 storm parameters as used in completing Form A-3.

Example Formats:

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			

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

Line of Insurance	Company Actual Loss / Exposure	Modeled Loss / Exposure	Difference
Total			

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

A. Provide the average annual zero deductible statewide loss costs produced using the list of hurricanes in the Base Hurricane Storm Set based on the 2007 Florida Hurricane Catastrophe Fund's aggregate personal residential exposure data ***(hlpm2007.exe)***.

Average Annual Zero Deductible Statewide Loss Costs

Time Period	Historical Hurricanes	Produced by Model
Current Year		
Previous Year		
Second Prior	N/A	N/A
Percentage Change Current Year/Previous Year		
Percentage Change Current Year/Second Prior	N/A	N/A

B. Provide a comparison with the statewide 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 loss.

D. If the data are partitioned or modified, the modeler shall provide the average annual zero deductible statewide loss costs for the applicable partition (and its complement) or modification as well as the modeled average annual zero deductible statewide loss costs in additional tables.

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)

Provide output in ASCII files based on running a series of hurricanes as provided in the Excel file ***"FormS6Input08.xls."*** Specifically, the output shall consist of windspeeds (in miles per hour for one minute sustained 10-meter winds) at hourly intervals over a 21×46 grid for the 500 combinations (600 combinations if the second quantile in the following list is used) of initial conditions specified in the Excel file for the following model inputs:

- CP = central pressure (in millibars)
- Rmax = radius of maximum winds (in statute miles)
- VT = translational velocity (forward speed in miles per hour)
- Quantiles for other input used by the modeler ($0 \leq p \leq 1$), e.g., Holland B parameter
- Quantiles for possible additional input variable (use is optional)

The value of CP in the Excel file will be used by some modelers as a direct input while other modelers will use CP as the basis for calculating pressure difference, which will then be used as an input. Modelers shall indicate whether CP was used as a direct input or as the basis for calculating pressure difference. Rmax and VT are to be used as direct inputs.

The fourth (and optional fifth) input in the above list specifies quantiles ($0 \leq p \leq 1$) of the distribution for any remaining model input such as the Holland B parameter. Quantiles from 0 to 1 have been provided in the Excel input file rather than specific values since modelers may use different ranges and distributions for the Holland B parameter or other input variables.

As an illustration, if the quantile has been specified as 0.345 in the Excel input file, then the modeler shall 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 distribution of the Holland B parameter or other input variable used by the modeler.

If quantile input variables are used, describe how the fourth and/or fifth input variables were used and provide the specific values that correspond to the quantiles in Form S-6. For example, if the first quantile input is used for the Holland B parameter, then the modeler needs to make that known and provide the specific values of the Holland B parameter that were used on each run.

The Excel input file contains 500 (or 600) combinations of initial conditions for each of three categories of hurricanes (1, 3, and 5), which follow a straight due west track passing through the point (25.7739N, 80.1300W). The first 100 combinations of initial conditions for hurricane categories 1, 3, and 5 are used in sensitivity analysis calculations. These initial conditions are given in the first worksheet (Sen Anal all Variables) of the Excel input file. The second set of 100 initial conditions for hurricane categories 1, 3, and 5 are given in the second worksheet (Unc Anal for CP) in the Excel input file. These conditions will be used in the uncertainty analysis for CP. The third worksheet (Unc Anal for Rmax), fourth worksheet (Unc Anal for VT), fifth worksheet (Unc Anal for Quantile 1), and sixth worksheet (Unc Anal for Quantile 2) are similar

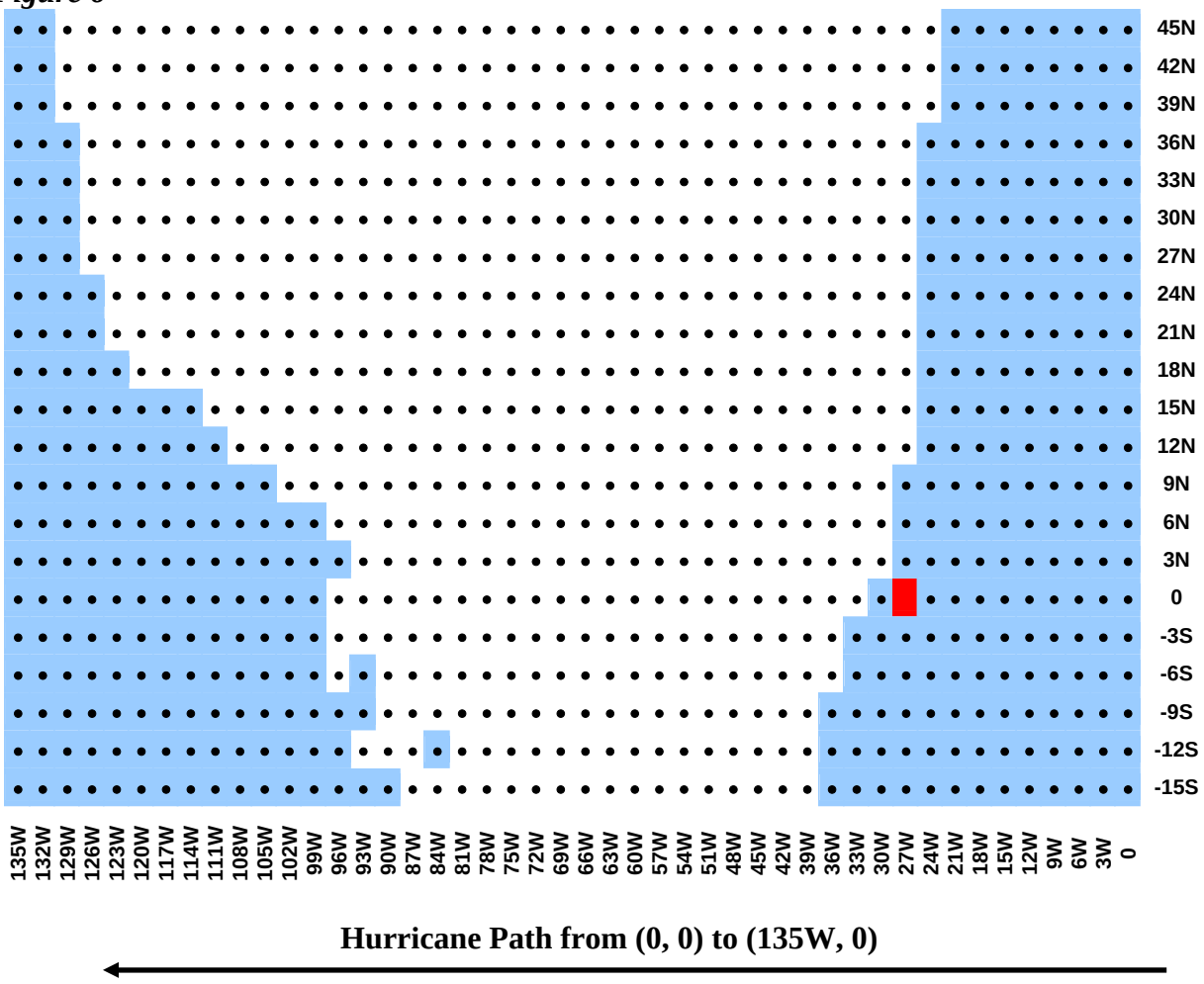
to the second worksheet and are used for performing uncertainty analyses for Rmax, VT and the input variable corresponding to the given quantiles, respectively.

Depending on the operational model, each of the 500 (or 600) simulated hypothetical events may not produce a maximum windspeed over the grid within the category given in the Saffir-Simpson scale. This is to be expected due to the deviation from the mean levels in a specific simulated event (for example, higher than average central pressure, slower than average forward speed could lead to a weak hurricane) and the grid resolution may not detect the maximum windspeed. However, the modeler shall provide the maximum windspeed produced over the 12 hours, if available, which may occur at an intermediate time point. For example, if the maximum windspeed occurs at 1.5 hours, this windspeed is the value that shall be provided.

The 21×46 grid of coordinates uses an approximate 3 statute mile spacing and is depicted in *Figure 6* for all three hurricane categories. For purposes of hurricane decay, the modeler is instructed to use existing terrain consistent with the grid in *Figure 6*.

The point (0, 0) is the location of the center of the hurricane at time 0, and is 30 miles east of the landfall location (25.7739N, 80.1300W), identified by the red rectangle in *Figure 6*. The exact latitudes and longitudes for the 966 vertices in the grid (21×46) are given in the seventh worksheet of the Excel input file.

Figure 6



Provide output on CD in ASCII and PDF format. Five output files (or six if second quantile input variable is used) shall be provided for each of the three hurricane categories. These files shall be named as shown in *Figure 7*.

Figure 7

Summary of Form S-6 Input and Output Files*

Hurricane Category	Input Values given in FormS6Input08.xls file	Output File	Modeler Windspeed Output File Name
1	Sensitivity Analysis all Variables	1	XXX08FormS61SA.dat
	Uncertainty Analysis CP	2	XXX08FormS61UACP.dat
	Uncertainty Analysis Rmax	3	XXX08FormS61UARmax.dat
	Uncertainty Analysis VT	4	XXX08FormS61UAVT.dat
	Uncertainty Analysis Quantile	5	XXX08FormS61UAQuantile1.dat
3	Sensitivity Analysis all Variables	6	XXX08FormS63SA.dat
	Uncertainty Analysis CP	7	XXX08FormS63UACP.dat
	Uncertainty Analysis Rmax	8	XXX08FormS63UARmax.dat
	Uncertainty Analysis VT	9	XXX08FormS63UAVT.dat
	Uncertainty Analysis Quantile	10	XXX08FormS63UAQuantile1.dat
5	Sensitivity Analysis all Variables	11	XXX08FormS65SA.dat
	Uncertainty Analysis CP	12	XXX08FormS65UACP.dat
	Uncertainty Analysis Rmax	13	XXX08FormS65UARmax.dat
	Uncertainty Analysis VT	14	XXX08FormS65UAVT.dat
	Uncertainty Analysis Quantile	15	XXX08FormS65UAQuantile1.dat

*If the second quantile input variable is used, a sixth output file will be required for each hurricane category.

Each of the files will contain 96,600 lines (100×21×46 = 96,600), each written according to the format (3I5,14F6.1).

Note: Use of ASCII files reduces the size of the files. Zipping the ASCII files is encouraged as it greatly reduces the file size.

Each row in the output files shall contain the following values:

1. Sample number (1-100)
2. E-W Grid Coordinate (0, 3, 6, 9, 12, 15, …, 135)
3. N-S Grid Coordinate (-15, -12, -9, -6, -3, 0, 3, 6, 9, …, 45)
4. Windspeed at time 0hr
5. Windspeed at time 1hr
6. Windspeed at time 2hr
7. Windspeed at time 3hr
8. Windspeed at time 4hr
9. Windspeed at time 5hr
10. Windspeed at time 6hr
11. Windspeed at time 7hr
12. Windspeed at time 8hr
13. Windspeed at time 9hr
14. Windspeed at time 10hr
15. Windspeed at time 11hr

16. Windspeed at time 12hr
17. Maximum windspeed*

*This is the maximum windspeed overall, if produced. Otherwise, provide the maximum windspeed over the 13 time points.

Successful completion of Form S-6 demonstrates that the modeler 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.

Form S-6 Uncertainty and Sensitivity Analysis Extended to Loss Cost

In addition to uncertainty and sensitivity analyses performed for windspeed in Form S-6, modelers are to perform uncertainty and sensitivity analyses for loss cost using a $100,000 fully insured structure with a zero deductible policy at each of the 586 non-shaded grid points in *Figure 6*. The Excel input file contains a seventh worksheet (Land-Water ID) that lists the 966 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 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

The Professional Team will extend analyses to loss cost based on a surrogate damage function as part of its preparation prior to reviewing the modeler's internal analyses (using the model's actual damage functions) during the on-site reviews. The modeler shall present to the Professional Team their analysis of their model using the model's vulnerability functions.

The Professional Team will use commercial software to create contour plots based on Form S-6 input and output for the following:

- Hourly windspeed for each hurricane category,
- Hourly standardized regression coefficients for sensitivity analysis,
- Expected percentage reduction in the variance of windspeed for uncertainty analysis,
- Loss cost based on the Professional Team's surrogate damage function.

A summary of all the contour plots is given in *Figure 8*.

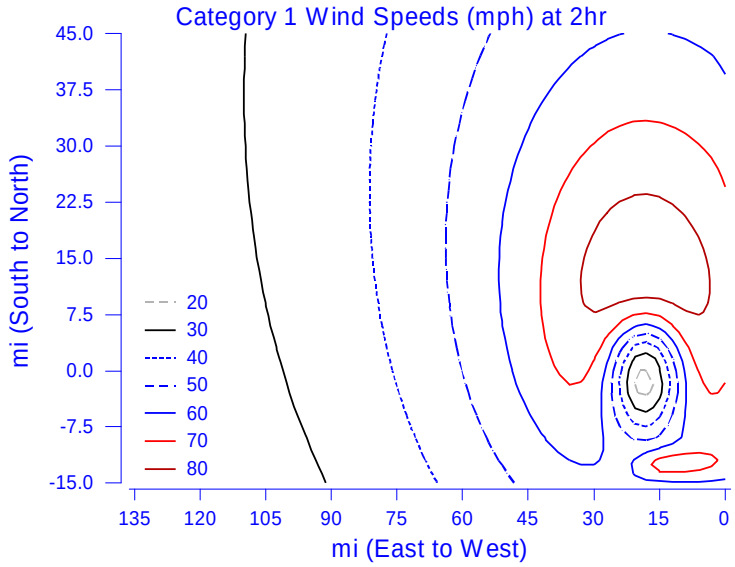
Figure 8

Summary of Contour Plots

Model Output	Contour Plot
Windspeed	Hourly plots for the windspeeds in output files 1, 6, and 11 in *Figure 7* (39 contour plots). See example contour plot provided in *Figure 9*.
Sensitivity Analysis	Hourly plots of standardized regression coefficients based on Form S-6 input as specified in *Figure 7* and the corresponding windspeed output files 1, 6, and 11 in *Figure 7* (39 contour plots). See example contour plot provided in *Figure 10*.
Uncertainty Analysis	Hourly plots of the expected percentage reduction in variance based on Form S-6 input as specified in *Figure 7* and the corresponding output files (39 contour plots for each of the following input variables), which are as follows: Central pressure: output files 2, 7, and 12 in *Figure 7* Radius of maximum winds: output files 3, 8, and 13 in *Figure 7* Translational velocity: output files 4, 9, and 14 in *Figure 7* Quantile: output files 5, 10, and 15 in *Figure 7* See example contour plot provided in *Figure 11*.
Loss Cost	Loss cost based on the maximum windspeed recorded over the 12hr time period in output files 1, 6, and 11 in *Figure 7* is to be calculated at each land-based grid point in *Figure 6*. The 586 land-based grid points in *Figure 6* are identified in the last worksheet (Land-Water ID) of the Form S-6 input file. Since there are 100 input vectors for each hurricane category, there are 100 estimates of loss cost at each of the land-based grid points. The contour plots are based on these values expressed as a percentage. See example loss cost contour plot provided in *Figure 12*.

Figure 9 is a contour plot of windspeed (mph) for a Category 1 hurricane at 2hr. Contours in this figure represent average windspeeds over all 100 input vectors at each grid point at t=2hr. The dark red and red contours represent hurricane or near hurricane force winds. These contours show the effect of decay as the hurricane moves from right to left across the grid as time increases.

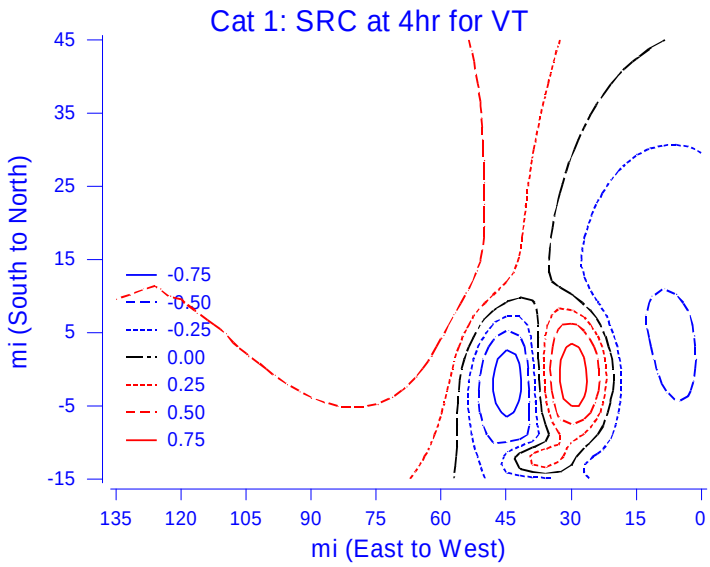
Figure 9



Average Windspeed (mph) Contours for Category 1 Hurricane at 2hr

Figure 10 shows contours of standardized regression coefficients (SRC) for VT for a Category 1 hurricane at 4hr. 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/methodology/pdf/meetings/2001/materials/demo%20ua-sa.pdf*). The contours in this figure represent average SRCs for VT over all 100 input vectors at each grid point at t=4hr. Red contours represent positive values of SRC while the blue contours represent negative values. If the SRC is positive, windspeed increases as VT increases while negative SRC values indicate that windspeed decreases as VT increases. These contours show the effect of each input variable on the magnitude of windspeed (and therefore on loss cost) as the hurricane moves from right to left across the grid as time increases.

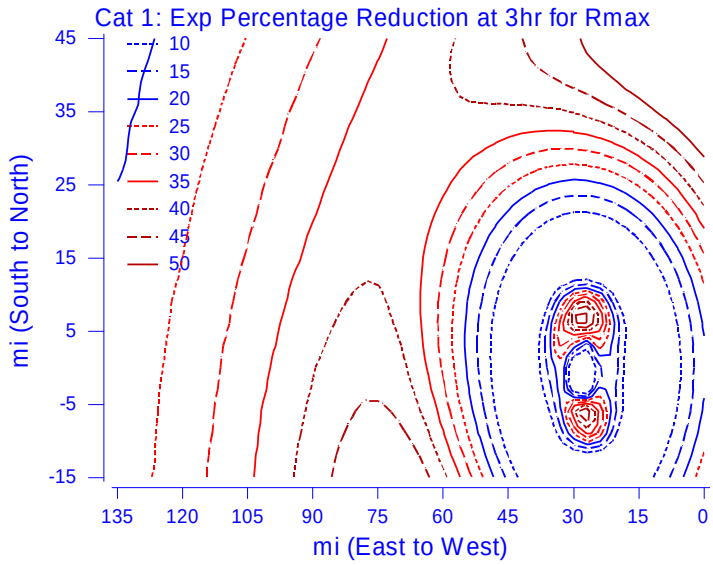
Figure 10



Contours of Standardized Regression Coefficients for VT for a Category 1 Hurricane at 4hr

Figure 11 shows contours of the expected percentage reduction in variance for Rmax for a Category 1 hurricane at 3hr. The calculation of the expected percentage reduction is explained on pages 26-30 of the *Professional Team Demonstration Uncertainty/Sensitivity Analysis*, (available at *www.sbafla.com/methodology/pdf/meetings/2001/materials/demo%20ua-sa.pdf*). The contours in this figure represent the average value of the expected percentage reduction in the variance of the windspeed attributable to Rmax when taken over all 100 input vectors at each grid point at t=3hr. Dark red contours represent expected percentage reductions of 40-50% while the red contours represent reductions of 25-35%. Blue contours represent expected percentage reductions of 20% or less. These contours illustrate the effect of each input variable on the uncertainty in windspeed (and therefore the uncertainty in loss cost) as the hurricane moves from right to left across the grid as time increases.

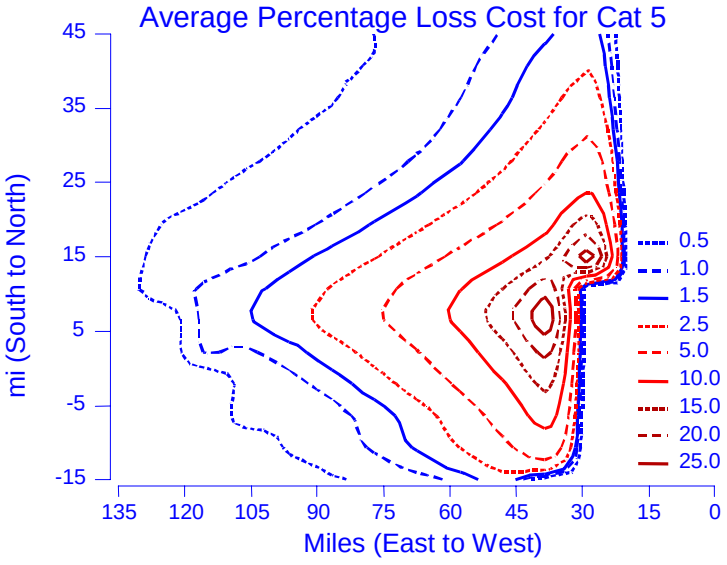
Figure 11



Contours of the Expected Percentage Reduction for Rmax for a Category 1 Hurricane at 3hr

Figure 12 shows contours of the average percentage loss cost for a Category 5 hurricane for each land-based grid point. A percentage loss cost shall be calculated for each land-based grid point based on the maximum windspeed observed at the point during the 12hr duration of the hurricane track. This calculation is repeated for each of the 100 input vectors. The contours in *Figure 12* represent the averages of these 100 percentages at each grid point over the 12hr duration of the hurricane track. Dark red contours correspond to average percentage loss costs of 15-25%. The largest losses occur shortly after landfall to the right of the hurricane path. The pattern in the lower right-hand corner of *Figure 12* corresponds to the Florida coastline south of Miami. While the average percentage loss costs depicted in *Figure 12* are based on the Professional Team's surrogate loss cost function, modelers are to generate average percentage loss cost contours based on their own loss cost calculations.

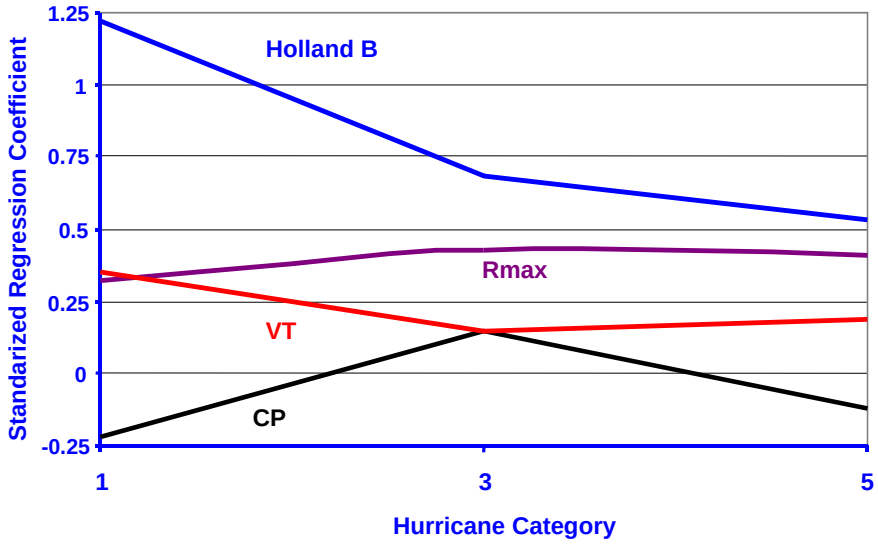
Figure 12



Average Percentage Loss Cost Contours for a Category 5 Hurricane

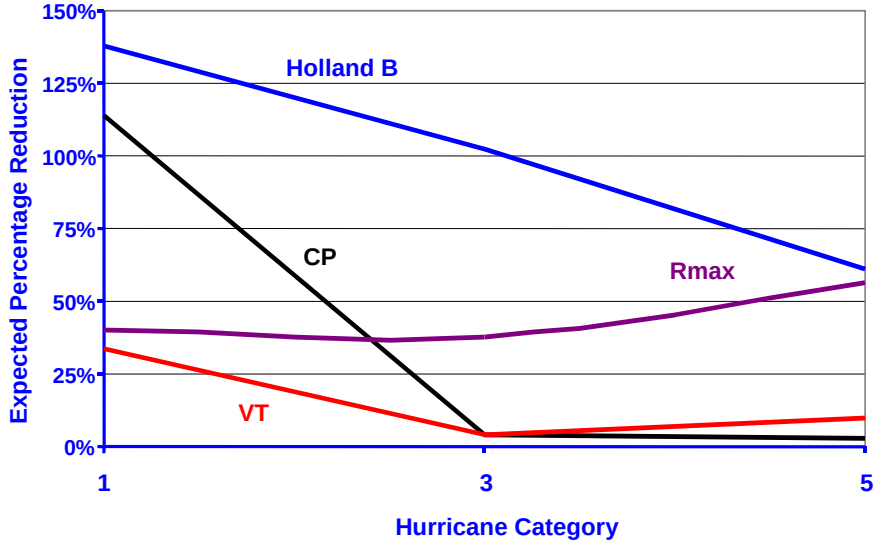
Figure 13 shows sample sensitivity analysis results for loss cost for all input variables based on a model that utilizes the Holland B parameter as the quantile variable. *Figure 14* shows the corresponding uncertainty analysis results. The results shown in *Figure 13* and *Figure 14* are based on log transformed data to ameliorate the influence of some very large observations. Such a transformation may or may not be beneficial for individual modelers.

Figure 13



Standardized Regression Coefficients for Loss Cost by Hurricane Category for Each Input Variable

Figure 14



Expected Percentage Reduction for Loss Cost by Hurricane Category for Each Input Variable

COMPUTER STANDARDS

C-1 Documentation*

*(*Significant Revision)*

A. The modeler shall maintain a primary document binder, containing a complete set of documents specifying the model structure, detailed software description, and functionality. Development of each section shall be indicative of accepted software engineering practices.

B. All computer software (i.e., user interface, scientific, engineering, actuarial, data preparation, and validation) relevant to the modeler's submission shall be consistently documented and dated.

C. The modeler shall maintain (1) a table of all changes in the model from the prior year's submission to the initial submission this year and (2) a table of all substantive changes since this year's initial submission.

D. Documentation shall be created separately from the source code.

Purpose: The primary document binder shall contain all the elements of the model and its development. This binder shall consist of several sub-binders, and the organization and relationships among them will admit accessibility through a hierarchical referencing scheme.

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.

Audit

1. The primary document binder, in either electronic or physical form, and its maintenance process will be reviewed. The binder shall contain fully documented sections for each Computer Standard.

2. All documentation shall be easily accessible from a central location.

3. Complete user documentation, including all recent updates, will be reviewed.

4. Modeler 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 the source code.

6. The tables specified in C-1.C that contain the items listed in Standard G-1, 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, C-3, C-4, C-5, and C-6.

7. Trace the model changes specified in Standard G-1, Disclosure 5 through all Computer Standards.

C-2 Requirements

The modeler shall maintain a complete set of requirements for each software component as well as for each database or data file accessed by a component.

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.

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.

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

The modeler shall maintain and document (1) detailed control and data flow diagrams and interface specifications for each software component, and (2) schema definitions for each database and data file. 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 structure;

4. LOSS COSTS accepts the output from DAMAGE and generates loss costs.

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.

2. A model component custodian, or designated proxy, shall be available for the review of each component.

C-4 Implementation

A. The modeler shall maintain a complete procedure of coding guidelines consistent with accepted software engineering practices.

B. The modeler 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 modeler 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 modeler shall maintain the following documentation for all components or data modified by items identified in Standard G-1, 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.

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

A. General

For each component, the modeler 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 modeler personnel other than the original component developers.

B. Component Testing

1. The modeler 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 modeler shall use testing software to assist in documenting and analyzing all databases and data files accessed by components.

2. The modeler 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).

Disclosures

1. State whether the model produces the same loss costs if it runs the same information more than once without changing the seed of the random number generator.

2. Provide an overview of the component testing procedures.

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 modeler 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.

C-6 Model Maintenance and Revision*

*(*Significant Revision)*

A. The modeler 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 shall result in a new model version number.

C. The modeler shall use tracking software to identify all errors, as well as modifications to code, data, and documentation.

D. The modeler 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.

Disclosures

1. Identify procedures used to maintain code, data, and documentation.

2. Describe the rules underlying the model and code revision numbering 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, the modeler shall provide the installation date under configuration control, the current version number, 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.

4. The list of all model revisions as specified in C-6.D will be reviewed.

C-7 Security

The modeler 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 modeler 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.

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.

Base Hurricane Storm Set:

The storm set used to validate modeled hurricane frequency impacting Florida against historical hurricanes as defined in Standard M-1.

By-Passing Hurricane:

A hurricane which does not make landfall, but still causes damage in Florida.

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**.

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:

Coverage provided for commercial-habitational exposures such as apartment buildings, condominium structures, and condominium associations. *See also*: **Residential Property Insurance**.

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 inter-changeably 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.

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**.

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.

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 test.

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.

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**.

Geocoding:

Assignment of a location to geographic coordinates.

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.

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.

Hurricane Strike Probabilities:

The probability in percent that a hurricane eye will pass within 50 miles to the right or 75 miles to the left of the listed location within the indicated time period when looking at the coast in the direction of the hurricane's movement.

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 hurricane in which the center of circulation (the "eye") crosses the coast. Only storms which make landfall while classified as a hurricane are of interest here.

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:

In calculating loss costs, losses shall be expressed as insured losses.

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.

Miles Per Hour (mph):

Miles per hour. Standard unit of windspeed measurement.

Millibar (mb):

Unit of air pressure. See 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**.

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**.

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 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:

Personal lines residential coverage, which consists of 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, and commercial lines residential coverage, which consists of 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.

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-5.

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 describe 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 have potential for changes to the loss costs. The Commission may determine in its judgment whether a change is significant.

Software Engineering:

The application of a systematic, disciplined, quantifiable approach to the 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.

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, provide the code with input through a user interface, and/or 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** (available at *www.miamidade.gov/buildingcode/ordinances.asp*).

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/BCISOld/bc/default.asp*).

4. **Florida Statutes** (available at *www.flsenate.gov/statutes/*).

5. **Hurricane Best Track Files (HURDAT), Atlantic Tracks File** (available at *www.nhc.noaa.gov/pastall.shtml*).

6. 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.

7. 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.

8. Iman, Ronald L., *"Latin Hypercube Sampling,"* **Encyclopedia of Statistical Sciences**, Update Volume 3, 1999.

9. Iman, Ronald L., Johnson, Mark E., and Schroeder, Tom A., *"Professional Team Demonstration Uncertainty/Sensitivity Analysis"* (available at *www.sbafla.com/methodology/pdf/meetings/2001/materials/demo%20ua-sa.pdf*).

10. Kaplan, John and DeMaria, Mark, *"A Simple Empirical Model for Predicting the Decay of Tropical Cyclone Winds After Landfall,"* **Journal of Applied Meteorology**, Volume 34, #11, November, 1995, pages 2499-2512.

11. Tropical Prediction Center/National Hurricane Center (TPC/NHC), **Tropical Cyclones of the North Atlantic Ocean, 1871-1998**, with updates.

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.

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/methodology/pdf/2006/PT%20Issues%20Report%20July%202006.pdf* and *www.sbafla.com/methodology/pdf/2006/Multidecadal%20Report%20July%202006.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 another 10-15 years and then decrease to activity levels like the low frequency and landfall times of the 1980s. Can the models take account of this, or should they?

Retrofit or Remodeled Structures

How are retrofit or remodeled buildings treated in the model? For year built data provided by insurance companies, is the year built or the year remodeled reflected?

Storm Surge

How do modelers look at storm surge in different areas? Should there be a Storm Surge Standard similar to the Demand Surge Standard?

Acceptability Process and Standards for Future Consideration

The Commission has incorporated in the *Report of Activities as of November 1, 2008,* a section entitled *"Acceptability Process and Standards for Future Consideration."* This section contains potential new Standards, public Disclosures, Audit requirements and procedures that were discussed during the Committee meetings on August 12 & 13, 2008. The Commission seeks public comments on the contents of this section in order to fully understand the implications of the various proposed changes. All comments should be provided in writing to Donna Sirmons, Florida Hurricane Catastrophe Fund, P. O. Drawer 13300, Tallahassee, Florida 32317 or *donna.sirmons@sbafla.com*.

Previous Inquiries or Investigations

ALE/Storm Surge/Infrastructure
(Note: Report was provided to the Commission, July 2005, and is available at *www.sbafla.com/methodology/pdf/meetings/2005/PT%20Issues%20Report%20July%202005.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/methodology/pdf/meetings/2002/materials/commercial%20residential%207%202002.pdf,* July 2005, available at *www.sbafla.com/methodology/pdf/meetings/2005/PT%20Issues%20Report%20July%202005.pdf,* and July 2006, available at *www.sbafla.com/methodology/pdf/2006/PT%20Issues%20Report%20July%202006.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 is 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 considered for adoption.

Demand Surge
(Note: Report was provided to the Commission, July 2003, and is available at *www.sbafla.com/methodology/pdf/meetings/2003/materials/Pro%20Team%20White%20Paper.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/methodology/pdf/meetings/2003/materials/Pro%20Team%20White%20Paper.pdf* and July 2005, available at *www.sbafla.com/methodology/pdf/meetings/2005/PT%20Issues%20Report%20July%202005.pdf*)

The Commission has assessed adopting HURDAT as the Official Hurricane 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 Official Hurricane Set and the complete North Atlantic HURDAT.

Hurricane Force Winds
(Note: Reports were provided to the Commission, July 2005, available at *www.sbafla.com/methodology/pdf/meetings/2005/PT%20Issues%20Report%20July%202005.pdf* and July 2006, available at *www.sbafla.com/methodology/pdf/2006/PT%20Issues%20Report%20July%202006.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/methodology/pdf/2006/PT%20Issues%20Report%20July%202006.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 storm 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 Modelers
(Note: Report was provided to the Commission, July 2003, and is available at *www.sbafla.com/methodology/pdf/meetings/2003/materials/Pro%20Team%20White%20Paper.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 modelers.

The Commission considers the costs and benefits associated with the review process and continually monitors its impact on modelers.

Interactions of Hurricanes
(Note: Report was provided to the Commission, July 2005, and is available at *www.sbafla.com/methodology/pdf/meetings/2005/PT%20Issues%20Report%20July%202005.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.

Risk Location
(Note: Report was provided to the Commission, July 2006, and is available at *www.sbafla.com/methodology/pdf/2006/PT%20Issues%20Report%20July%202006.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/methodology/pdf/meetings/2005/PT%20Issues%20Report%20July%202005.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. ACCEPTABILITY PROCESS AND STANDARDS FOR FUTURE CONSIDERATION

ACCEPTABILITY PROCESS AND STANDARDS FOR FUTURE CONSIDERATION

The Commission seeks public comments on the following potential new Standards, Disclosures, Forms, Audit requirements, and procedures in order to fully understand the implications of the various proposed changes. Additions within an existing Standard are indicated as underlined text. All comments should be provided in writing to Donna Sirmons, Florida Hurricane Catastrophe Fund, P. O. Drawer 13300, Tallahassee, Florida 32317 or *donna.sirmons@sbafla.com*. Please provide comments by January 10, 2009.

Addition to Acceptability Process opening portion:

The notification by a modeler must include whether the modeler desires to be reviewed for compliance with both the personal and commercial residential Standards or only for the personal residential Standards. The Commission will review models separately for compliance with the personal residential and commercial residential Standards. Models will initially be reviewed for compliance with the personal residential Standards. If a model is determined to be acceptable under the personal residential Standards, the Commission will review the model (if requested by the modeler) for compliance with the commercial residential Standards.

Addition to Acceptability Process under IV. Professional Team On-Site Review:

2. b. If an additional verification review is requested, the modeler will be required to reimburse the FHCF for all the usual and customary expenses connected to the additional verification review.

Addition to Acceptability Process under V. Review by the Commission:

Trade Secret List

Meteorological

- Model formulation for the vertical variation of the hurricane windfield including the data, methods, calculations, and procedures used (requirement for models being reviewed for compliance with the commercial residential Standards).

Vulnerability

- Commercial residential vulnerability curves for the construction types in Form A-10CR.

Addition to Commission Structure Section under Commission Meeting to Review Models for Acceptability:

If a modeler requested review for compliance with the commercial residential Standards and the model was determined acceptable under the personal residential Standards, then the Commission Chair will announce that the Commission is ready to review the model for acceptability under the commercial residential Standards. The commercial residential review will follow the same process used for personal residential Standards.

Addition to Standard G-1, new Disclosure 6:

6. Provide a chronological list of editorial changes using the page numbers from the current year's initial submission. All changes subsequent to the current year's initial submission shall be included in this list.

Addition to Standard A-1, new Audit 3:

3. The model will be reviewed to determine that damages, weakening, or destruction attributable to flood or storm surge are excluded and not permitted to further affect the modeled loss costs and probable maximum loss levels for wind related damage in hurricanes for the state of Florida.

New Commercial Residential Standards, Disclosures, and Forms:

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

*(*New Standard)*

A. The computer model shall project loss costs for commercial residential exposures from hurricane events.

B. The computer model shall project probable maximum loss levels including exposures for both commercial residential and personal residential exposures from hurricane events.

Purpose: This Standard gives a high level view of the scope of the model to be reviewed, namely projecting loss costs for commercial residential exposures and probable maximum loss levels by including commercial residential exposure in addition to personal residential exposures from hurricane events.

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 commercial residential loss costs and probable maximum loss levels.

M-4CR Hurricane Vertical Wind Profile*

*(*New Standard)*

The model shall represent the vertical profile of damaging winds for commercial structures.

Purpose: This Standard requires that the windfield model be implemented consistently with the vertical distribution of the hurricane boundary layer windfield.

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

Disclosures

1. Provide a plot of the maximum 1-minute windspeed (*x*-axis) versus height above the ground (*y*-axis) at the radius of maximum wind as measured at the surface.

2. Justify the choice of the vertical wind profile as used in the model.

3. Identify all non-meteorological variables that affect vertical variation of windspeed.

4. Describe any variations in the treatment of the model windfield for stochastic versus historical storms and justify this variation.

5. Provide a list of any published references used in the development of the vertical wind profile.

Audit

1. Provide any modeler-specific research performed to develop the vertical windfield distributions used in the model. Identify all databases used.

2. The vertical distribution of the winds as used in the model will be reviewed.

V-1CR Derivation of Commercial Residential Vulnerability Functions*

*(*New Standard)*

A. Development of commercial residential vulnerability functions is to be based on a combination of the following: (1) historical data, (2) tests, (3) structural calculations, (4) expert opinion, or (5) site inspections. Any development of the commercial residential vulnerability functions based on structural calculations or expert opinion shall be supported by tests, site inspections, and historical data.

B. Development of commercial residential vulnerability functions shall consider building height and construction type.

C. The method of derivation of the commercial residential vulnerability functions shall be theoretically sound.

D. Any modification factors/functions to the commercial residential vulnerability functions or structural characteristics and their corresponding effects shall be clearly defined and be theoretically sound.

E. Commercial residential vulnerability functions shall be separately derived for building structures and appurtenant structures.

Purpose: The development of commercial residential vulnerability functions shall not be based exclusively on structural calculations or expert opinion. Use of structural calculations or expert opinion shall be supported by site inspections, tests, and historical data, and their use shall be appropriate.

Disclosures

1. Describe the nature and extent of actual insurance claims data used to develop the model's commercial residential 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.

2. Describe the research used in the development of the model's commercial residential vulnerability functions.

3. Describe the number of categories of the different commercial residential vulnerability functions. Specifically, include descriptions of the structure types, lines of business, and coverages in which a unique commercial residential vulnerability function is used.

4. Describe the inclusion of additional features, such as year of construction, water infiltration and its effect on lower levels, percentage and square footage of openings, glazing effects and missile impact. Summarize tests, site inspections,

and historical data, including the source, and provide a brief description of the resulting use of these data in development, validation, or verification of the commercial residential vulnerability functions.

Audit

1. 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. To the extent that historical data are used to develop commercial residential vulnerability functions, demonstrate the goodness-of-fit of the data to fitted models. Complete reports detailing loading conditions and damage suffered are required for any test data used. Complete structural calculations shall be presented so that a variety of different structure types and construction characteristics may be selected for review. The basis for expert opinion and original site inspection reports shall be available for review.

2. Copies of any papers, reports, and studies used in the development of the commercial residential vulnerability functions shall be available for review. Copies of all public record documents used may be requested for review.

3. Multiple samples of commercial residential vulnerability functions for building structures 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.

4. Justify the construction types and characteristics used, and provide validation of the range and direction of the variations in damage.

A-2 Underwriting Assumptions*

*(*Significant Revision)*

A. When used in the modeling process or for verification purposes, adjustments, edits, inclusions, or deletions to insurance company input data used by the modeler shall be based upon accepted actuarial, underwriting, and statistical procedures.

B. 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) claim payment practices, (4) contractual obligations, and (5) relevant underwriting practices underlying those losses, as well as any actuarial modifications, shall be appropriate.

Purpose: Insurance company data used in model development may include appropriate insurer or modeler adjustments that do not diminish the usefulness of the data.

Loss costs and probable maximum loss levels may be significantly impacted by the way in which insurers pay claims following a hurricane event. To appropriately use historical insurer claims data to verify modeled loss costs and probable maximum loss levels it is important that insurer claim practices are understood and that the effects of insurer claim practices on the loss costs and probable maximum loss levels are explained.

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

New Disclosure

6. Describe the methods used in the model to account for the contractual responsibilities of the policyholder.

New Audit Requirement

2. Information used to model the effects of contractual responsibilities will be reviewed.

A-3 Loss Cost Projections and Probable Maximum Loss Levels*

*(*Significant Revision)*

A. Loss cost projections and probable maximum loss levels produced by hurricane loss projection models 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 provision for direct hurricane storm surge losses or losses on properties that have been previously destroyed or substantially weakened by hurricane storm surge.

A-7 Deductibles and Policy Limits*

*(*Significant Revision)*

A. The methods used in the development of mathematical distributions to reflect the effects of deductibles, coinsurance, 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.

A-10CR Commercial Residential Output Ranges*

*(*New Standard)*

Commercial Residential output ranges shall be logical and any deviations supported.

Purpose: This Standard requires the production of commercial residential output ranges.

Disclosure

1. Provide a completed Form A-10CR, Commercial Residential Output Ranges using the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data.

Audit

1. All data used in the development of commercial residential loss costs will be reviewed.

2. Form A-10CR will be reviewed.

Form A-10CR: Commercial Residential Output Ranges

A. Provide commercial residential output ranges in the format shown in the file named ***"2008FormA-10CR.xls"*** by using an automated program or script. A hard copy of the commercial residential output ranges shall be included in the submission. Provide the commercial residential output ranges on CD in Excel format. The file name shall include the abbreviated name of the modeler, the Standards year, and the Form name.

B. Provide commercial residential loss costs by county. Within each county, commercial residential loss costs shall be shown separately per $1,000 of exposure, based on the sum of all coverages, using a 3% per occurrence deductible for frame, masonry veneer, masonry, superior masonry, and unknown construction types. For each of these categories using ZIP Code centroids, provide the highest loss cost, the lowest loss cost, and the median loss cost based on the 2007 Florida Hurricane Catastrophe Fund aggregate exposure data provided in the file named ***"crhlpm2007.exe."***

C. If a modeler has commercial residential loss costs for a ZIP Code for which there is no exposure, then the modeler shall assume the exposure in that ZIP Code is zero. Provide a list in the submission document of those ZIP Codes where this occurs.

S-1CR Commercial Residential Modeled Results and Goodness-of-Fit*

*(*New Standard)*

The use of historical data in developing commercial residential aspects of the model shall be supported by rigorous methods published in currently accepted scientific literature.

Purpose: Aspects of commercial residential model development involving the fitting of probability distributions to historical data are subject to the same evaluation process used in Standard S-1.

Disclosures

1. Identify the form of the probability distributions used for each commercial residential specific function or variable, if applicable. Identify statistical techniques used for the commercial residential 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.

2. Provide the date of loss of the insurance company commercial residential data available for validation and verification of the model.

3. Provide a completed Form S-3CR, Distributions of Commercial Residential Stochastic Hurricane Parameters.

Audit

1. Probability distributions and goodness-of-fit tests will be reviewed.

2. Form S-3CR will be reviewed. Provide justification for the distributions selected including, for example, citations to published literature or analyses of specific historical data.

Form S-3CR: Distributions of Commercial Residential Stochastic Hurricane Parameters

Provide the probability distribution functional form used for each commercial residential stochastic hurricane parameter in the model. Provide a summary of the rationale for each functional form selected for each general classification.

Stochastic Hurricane Parameter (Function or Variable)	Functional Form of Distribution	Rationale

C-8CR Computer Standards*

*(*New Standard)*

The (a) Documentation, (b) Requirements, (c) Model Architecture and Component Design, (d) Implementation, (e) Verification, (f) Model Maintenance and Revision, and (g) Security aspects relating to the model for commercial residential properties shall comply with Standards C-1, C-2, C-3, C-4, C-5, C-6, and C-7.

Purpose: The computer-based aspects of the model for commercial residential properties are the same as for personal residential lines. Therefore, the Computer Standards are used, without change, for the audit and acceptability of the model.

Disclosure

1. Identify and justify any variations in process, procedures, and data sources between personal residential lines and commercial residential properties.

Audit

1. The computer-based commercial residential product will be reviewed using the Computer Standards: C-1, C-2, C-3, C-4, C-5, C-6, and C-7.

X. APPENDICES

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 [1]paragraph (3)(c), 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 11 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 of the Department of Community Affairs.
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 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.

(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 at least annually.

(f) 1. A trade secret, as defined in s. 812.081, 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. 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.

3. This paragraph is subject to the Open Government Sunset Review Act of 1995 in accordance with s. 119.15, and shall stand repealed on October 2, 2010, 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.

[1]Note.—Redesignated as paragraph (3) (d) by s. 11, ch. 2008-66.

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 Modelers
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 Modelers to provide input for the Evaluation Process
November 30 -	Adoption of Initial Standards and Guidelines

1996

January 8 -	Review of Modeler 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 Modeler 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
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 EQECAT 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 EQECAT 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 *Report of Activities*

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 *Report of Activities*

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 *Report of Activities*

	October 15 -	Adoption of 2001 Standards and *Report of Activities* (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 *Report of Activities*
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 *Report of Activities*
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 *Report of Activities*
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, 27 & 28 -	Committee Meetings
	August 10 -	Actuarial Standards and Acceptability Process Committee Meetings
	September 14 & 15 -	Adoption of 2005 Standards and *Report of Activities*
2006		
	January 25 & 26 -	Workshop to Discuss Modeling Commercial Residential Exposure, Simplification of the Commission's Review Process, and to Review the Study *"An Assessment of Computer Generated Loss Costs in Florida"*
	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
	July 26 & 27 -	Committee Meetings and Rule Workshop
	August 17 & 18 -	Adoption of 2006 Standards and *Report of Activities*; 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 *Report of Activities*
	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 *Report of Activities*
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 *Report of Activities*

Transcript Information

All meetings of the Florida Commission on Hurricane Loss Projection Methodology are transcribed by a Court Reporter. The meetings are not put on videotape or audiotape. 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

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
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P. O. Box 13300
Tallahassee, Florida 32317-3300

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