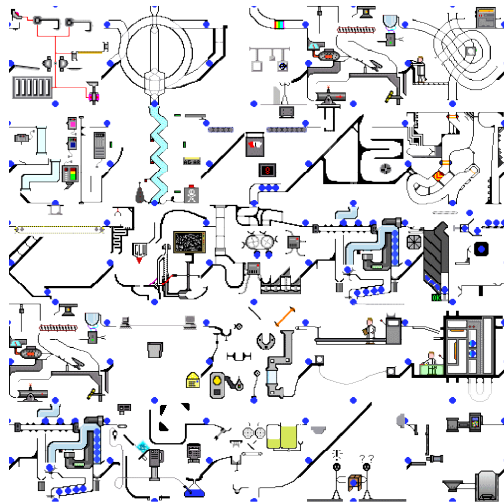


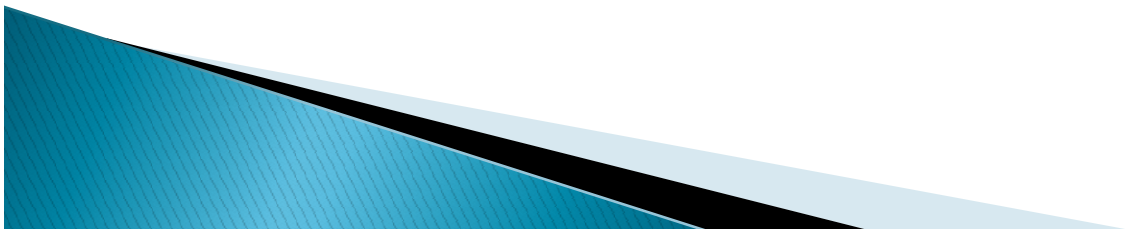
New Modeling ASOPs



Ken Kasner, FCAS, MAAA
Casualty Loss Reserve Seminar
September 2013

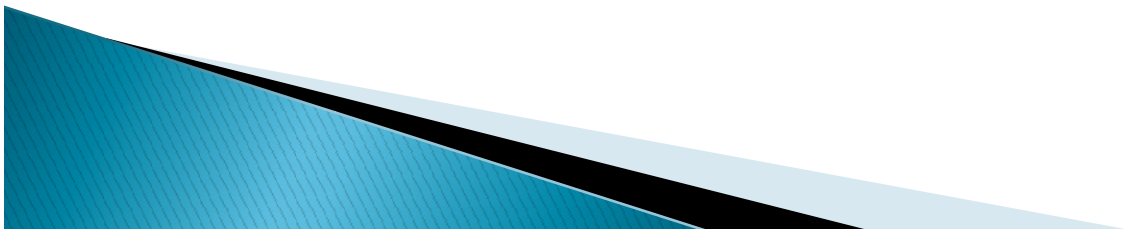
Agenda

- ▶ Current ASOP No. 38
- ▶ Past Attempts to Revise ASOP No. 38
- ▶ Modeling ASOP Work in Other Practice Areas
- ▶ ASB Direction in 2012
- ▶ New Modeling ASOP
- ▶ New Catastrophe Modeling ASOP
- ▶ Review & Comment Periods



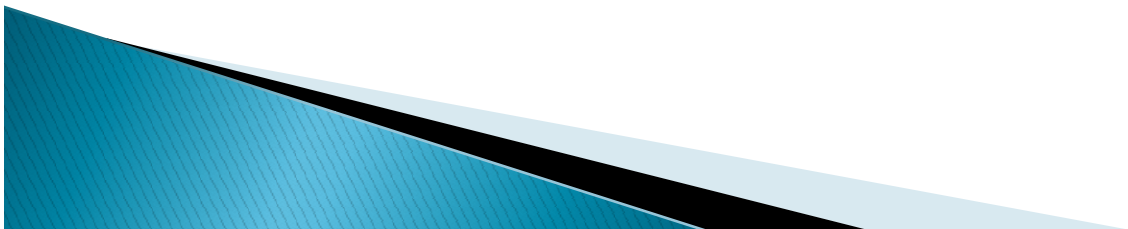
Current ASOP No. 38

- ▶ Using Models Outside the Actuary's Area of Expertise, June 2000, P&C
- ▶ Genesis: catastrophe models in ratemaking; hurricane and earthquake; stochastic simulation models; meteorological, seismological, and engineering elements
- ▶ First exposure draft: using models with non-actuarial components, all practice areas
- ▶ Comments:
 - Unnecessary or burdensome for the other practice areas
 - Was a critical need for standard in P&C, however



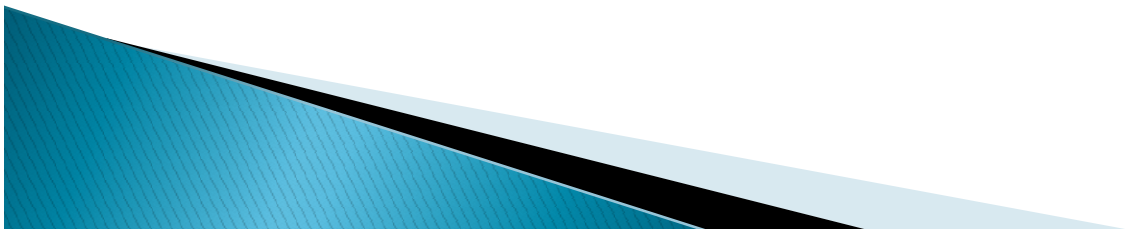
Current ASOP No. 38 – cont.

- ▶ Final ASOP: using models incorporating specialized knowledge outside area of expertise, P&C only
- ▶ Examples: catastrophe models, interest rate, investment return, credit scoring, DFA, etc
- ▶ Currently the only ASOP that specifically addresses modeling



Current ASOP No. 38 – Key Guidance

1. Determining appropriate reliance on experts
2. Basic understanding of the model
3. Evaluating appropriateness of the model for the intended application
4. Validation – input and output
5. Determining if appropriate to use the model results
6. Reliance on model evaluation by another actuary



Past Attempts to Revise ASOP No. 38

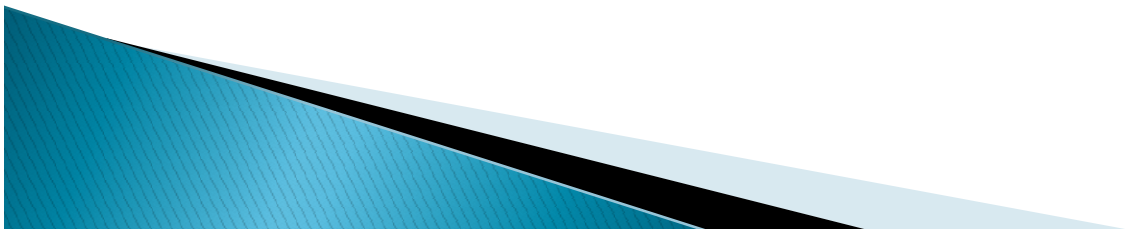
2003–2006

- ▶ ASB desire for modeling ASOP applicable to all areas of practice
- ▶ Oct 2003 and Mar 2006 exposure drafts
- ▶ Both were for using models, outside the actuary's expertise, all practice areas
- ▶ Key comments:
 - Level of work required using models for small portion of work product
 - Lowered bar for P&C work too much, particularly complex, large impact catastrophe models
 - Set too high a bar for non-P&C areas – practice was disclosure of reliance on work of another expert or on generally accepted model
- ▶ ASB post-exposure direction: incorporate positives into ASOP No. 38; maintain as P&C-only

Past Attempts to Revise ASOP No. 38

2010–2011

- ▶ ASB Casualty Committee Task Force
- ▶ Sept 2011 exposure draft
- ▶ Incorporated positive features from 2006, updated to current terminology
- ▶ Using models, outside the actuary's expertise, P&C only



Past Attempts to Revise ASOP No. 38

2010–2011 – cont.

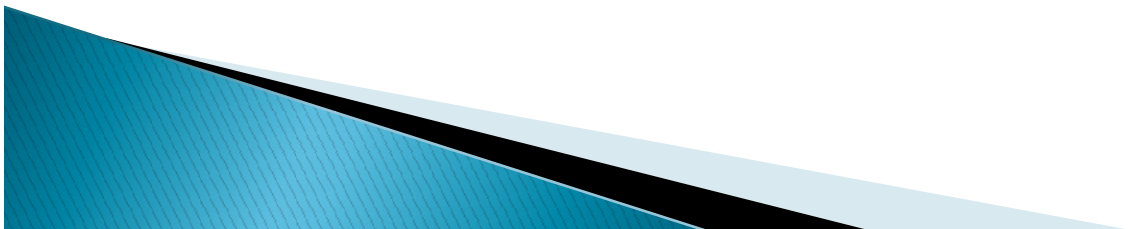
▶ Key guidance:

1. Evaluate appropriateness of model for intended use
2. Review of the model
 - a. Actuary's personal review of the model, or
 - b. Relying on model review by another actuary

▶ Key comments:

- Holding a P&C actuary to standard but not other practice areas for same model
- Should allow reliance on other experts in addition to other actuaries

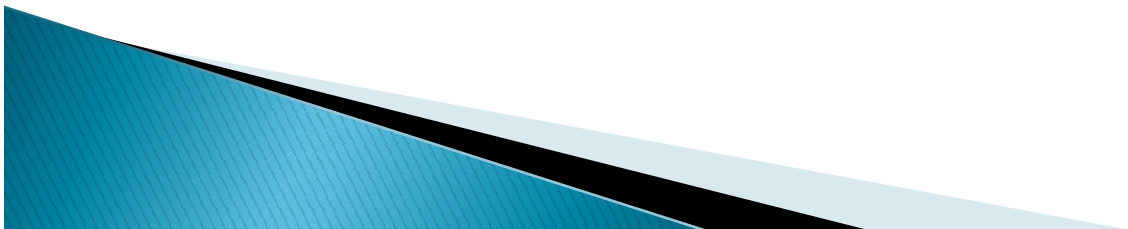
▶ ASB: let's reevaluate strategy



Modeling ASOP Work in Other Practice Areas

2010–2012

- ▶ Driver: Results of models being used directly in financial reporting
- ▶ ASB Life Committee Task Force
- ▶ Discussion Draft on Modeling in Life Insurance and Annuities, February 2012
- ▶ Designing, developing, modifying, or using all models used in life insurance and annuities



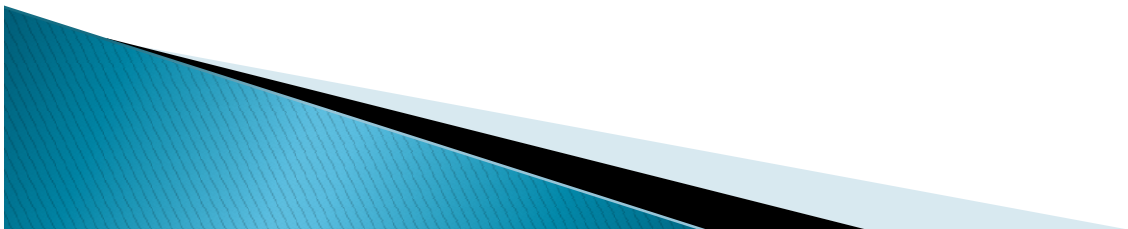
Modeling ASOP Work in Other Practice Areas

2010–2012 – cont.

- ▶ Key guidance:
 1. Resources and controls should relate to degree of reliance and importance
 2. Develop and operate model to meet intended purpose
 3. Consider structure of the model
 4. Appropriate assumptions
 5. Validation of the model and the output
- ▶ Comments received, but not advanced to exposure draft (per se)
- ▶ ASB: let's also factor into the reevaluation of strategy

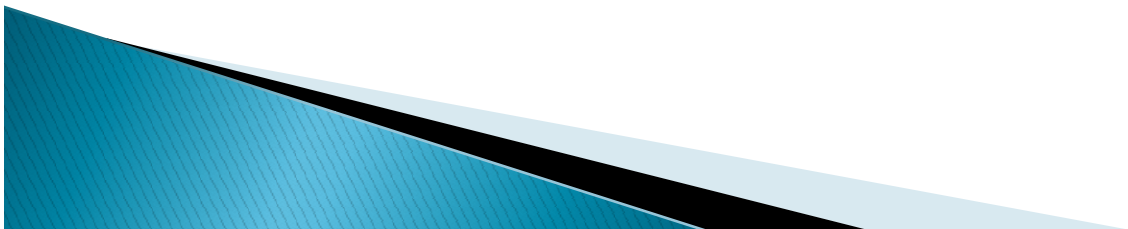
ASB Direction in 2012

- ▶ Modeling so commonly and routinely performed in all practices areas
- ▶ Great desire for modeling standards for all areas
- ▶ Different standards for catastrophe versus non-catastrophe models? (complex vs. non-complex, some vs. all)
- ▶ “When to do a little, when to do a lot”?
- ▶ Developing vs. using models?
- ▶ Reliance?



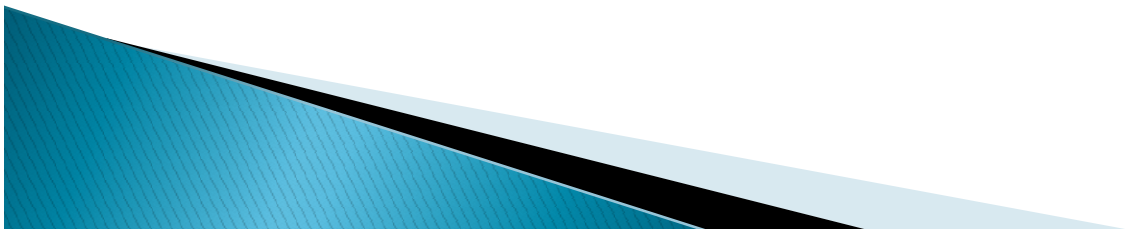
ASB Direction in 2012 – cont.

- ▶ Leverage work from both the past ASOP No.38 revision attempts and the Life and Annuities Discussion Draft
- ▶ Develop:
 - 1) New ASOP covering all models for all practice areas
 - 2) ASOP covering catastrophe models for all practice areas (to replace current ASOP No.38)



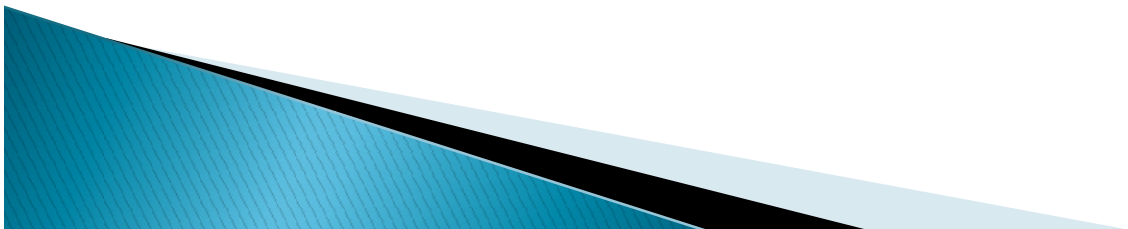
1. New Modeling ASOP

- ▶ General Committee Task Force comprised of members with experience in Life, Health, Pension, P&C, and ERM
- ▶ Draws on the work of the Life Committee Task Force that produced the Discussion Draft
- ▶ Selecting, designing, building, modifying, developing, or using models
- ▶ All forms of models, all practice areas



New Modeling ASOP – cont.

- ▶ Full application appropriate when model users rely heavily on model results and model results have material financial effect
- ▶ Full application may not be necessary in cases where results not heavily relied upon or do not have a material effect
- ▶ Actuary to use professional judgment in determining where it is appropriate to deviate from the guidance in the standard
- ▶ Practice-neutral terminology
- ▶ Contemporary, to allow for new developments



New Modeling ASOP – Key Guidance

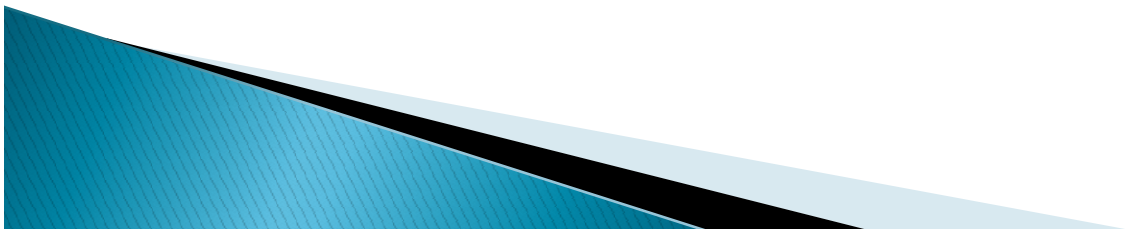
1. Applies to all models in all practice areas

- Model reliance and financial importance
 - Full application appropriate when heavy reliance on results and model has material financial effect
 - Full application may not be applicable when results are either not heavily relied upon or do not have material financial effect
 - Actuary to use professional judgment
- Models developed by others
 - Actuary should make reasonable and appropriate attempt to understand model
- If not applying some or all of the ASOP guidance, actuary should be prepared to identify such circumstances and to justify limiting full application
 - Disclose if deviation is material

New Modeling ASOP – Key Guidance cont.

2. **Select, design, build, modify, develop, or use model to meet the intended purpose**

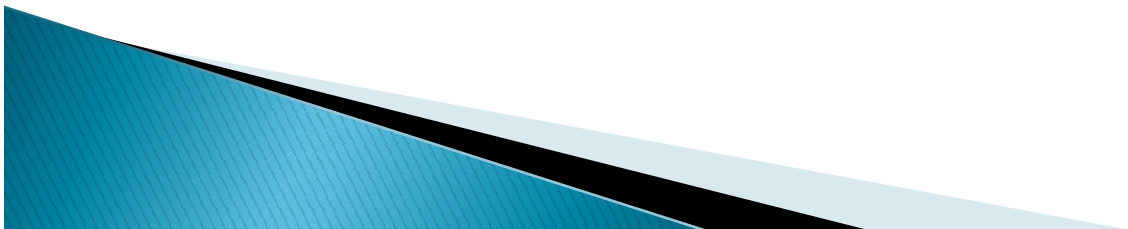
- Covers all aspects of modeling
- Understand the model
 - Basic operation, relationships, sensitivities, strengths and weaknesses, extent can fulfill intended purpose, etc
- Consider model structure
 - How meets intended purpose, grouping inputs, model granularity, deterministic or stochastic, etc
- Inputs, assumptions and parameters
 - Appropriate in light of intended purpose, experience used, credibility, consistency, etc



New Modeling ASOP – Key Guidance cont.

3. Mitigate model risk

- Validation, checking and analysis
 - Nature and degree consistent with model complexity and intended purpose
 - Model validation and analyzing
 - Analyzing model output
 - Consider peer review, where practical
- Appropriate governance and controls
 - To minimize model risk, maintain integrity of model, avoid introduction or use of unintentional or untested changes



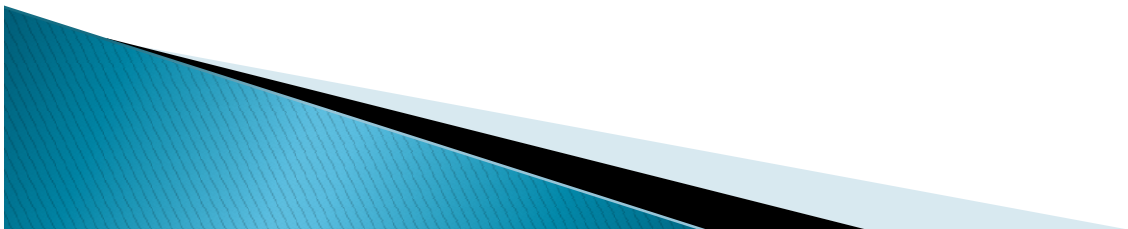
New Modeling ASOP – Key Guidance cont.

4. Presentation of results

- Consider including explanation of model
 - Intended application
 - Extent to which model fulfills its intended purpose
 - Material limitations, if any
 - Uncertainty in model results
- Consider including reconciliation to prior report or analysis
- Consider including description of judgment applied in selection of inputs and methodology
 - Relative to neutral position
 - “conservative”, “most likely”, “optimistic”, etc
- Explain basis, if specified by law, statute or regulation

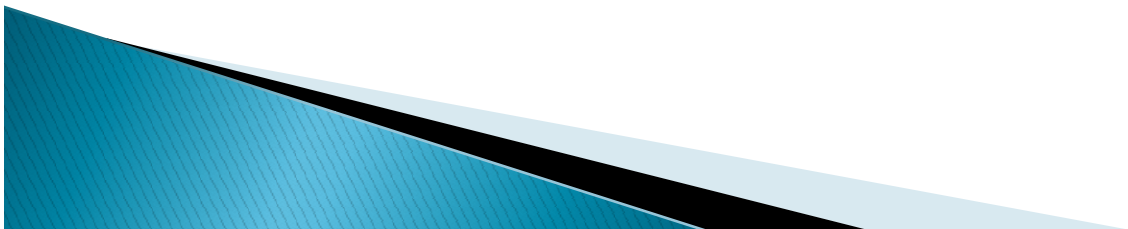
2. New Catastrophe Modeling ASOP

- ▶ General Committee Task Force of members with experience in Life, Health, P&C, and ERM
- ▶ Draws on previous work of prior ASOP No. 38 revision Task Forces
- ▶ All forms of catastrophe models, all practice areas
- ▶ Applies only to selection and use of models that are built to specifically address catastrophes
- ▶ Note: all other aspects of catastrophe modeling are covered by the new Modeling ASOP



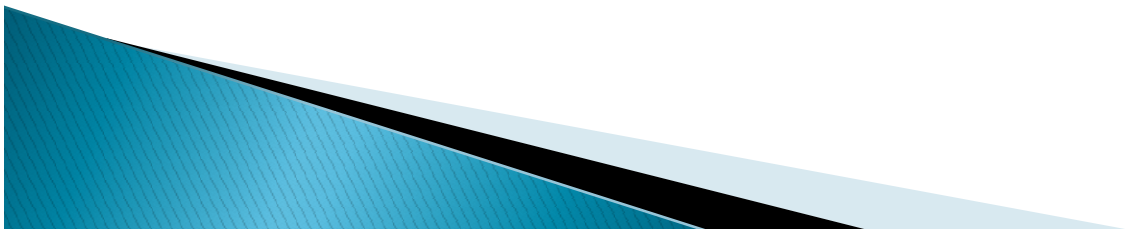
New Catastrophe Modeling ASOP – cont.

- ▶ Applies to catastrophe models of natural perils such as hurricanes, earthquakes, tornadoes, etc
- ▶ Also applies to catastrophe models for man-made perils such as terrorism and pandemics
- ▶ Does not apply to models of financial or economic risk which may have, as part of their output, extreme and potentially catastrophic events such as hyper-inflation or stock market collapse



New Catastrophe Modeling ASOP – cont.

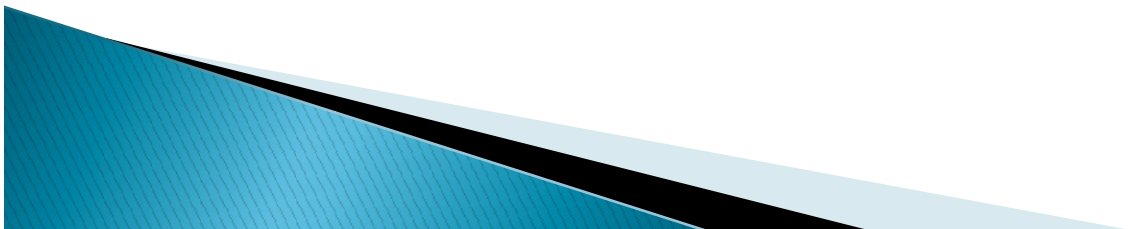
- ▶ Maintains the key responsibilities provided in current ASOP No.38
- ▶ Level of effort in understanding and evaluating model should be consistent with project's objective and materiality to the results
- ▶ Contemporary here as well, to allow for new developments



New Catastrophe Modeling ASOP – Key Guidance

1. Determine appropriate reliance on experts

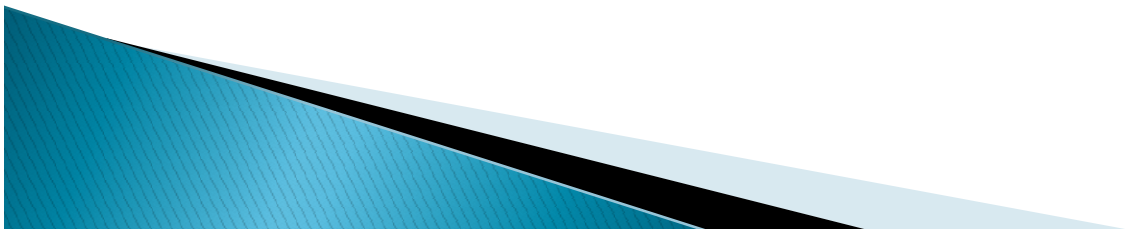
- Whether individuals are experts in applicable field
- Extent to which model reviewed or opined on by experts
- Whether there are standards applicable to model, and whether model has been certified as having met



New Catastrophe Modeling ASOP – Key Guidance cont.

2. Understand the model when relying on experts

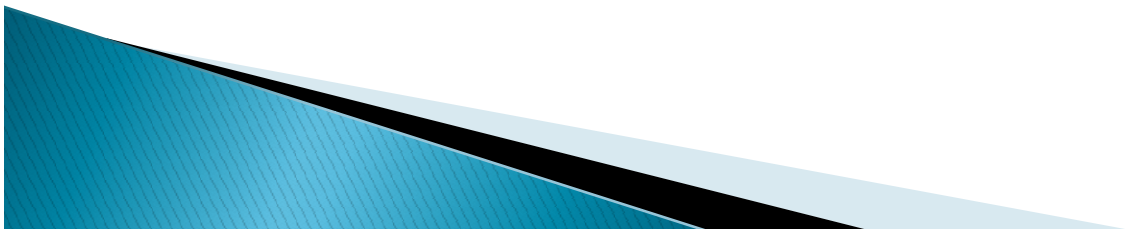
- Be familiar with basic components and how they interrelate within model
- Evaluate reasonableness of user input and understand relationship between input and output
- Determine that model output is consistent with project's objective



New Catastrophe Modeling ASOP– Key Guidance cont.

3. Model appropriate for project's objective

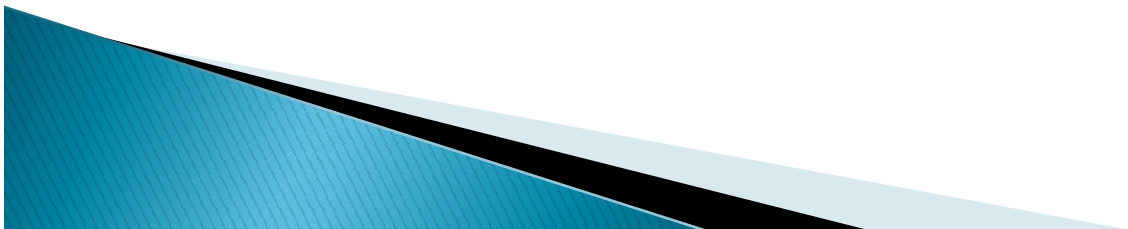
- Consider limitations of the model, modifications, and assumptions needed in order to apply model output
- Considerations include adequacy of historical data in representing range of expected outcomes
- Make effort to be aware of significant developments in relevant field



New Catastrophe Modeling ASOP– Key Guidance cont.

4. Appropriate validation

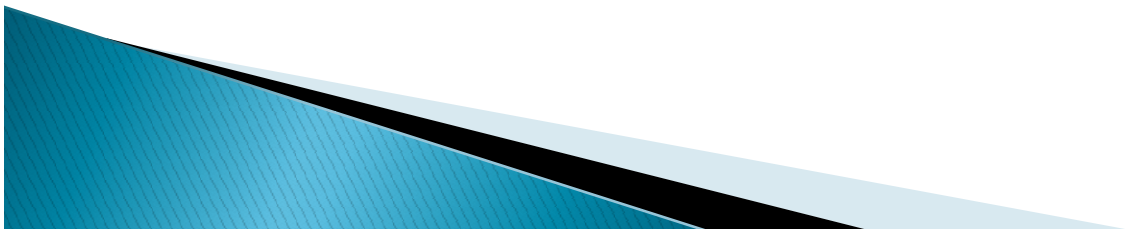
- Evaluate reasonableness of model output considering input data and project's objective
- Consider factors such as historical observations compared to model results, consistency among output results, sensitivity of model outputs



New Catastrophe Modeling ASOP– Key Guidance cont.

5. Appropriate use of the model and its results

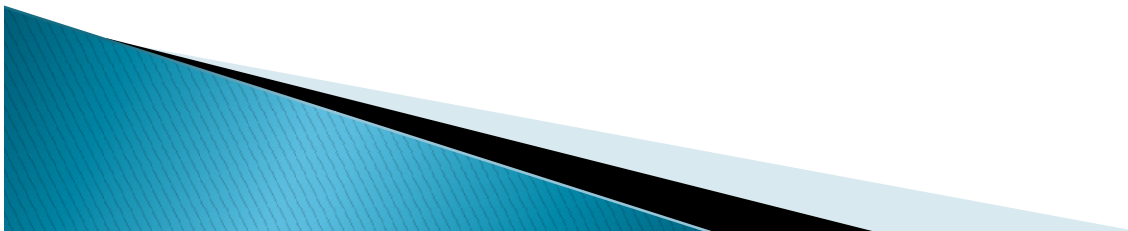
- Using professional judgment, determine whether it's appropriate to use model results to develop work product
- Determine whether it's appropriate to make any adjustments to model output to meet the project's objective.



New Catastrophe Modeling ASOP– Key Guidance cont.

6. Reliance on another actuary who has used a catastrophe model

- Should be satisfied that the other actuary's use of model was performed in accordance with standard and is appropriate for project's objective



Review & Comment Periods

- ▶ **Modeling ASOP**
 - Exposure Release: June 2013
 - Comment Deadline: **September 30, 2013**
- ▶ **Catastrophe Modeling ASOP**
 - Exposure Release: TBD (Soon)
 - Comment Deadline: TBD

Review and comment please

(Instructions in exposure drafts)

