

Professionalism: The Proposed ASOP on Modeling

**The Actuaries' Club of the Southwest
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A New Section of the SOA

The 20th Section of the Society of Actuaries
has now been formed!

<< **The Modeling Section** >>

History...

- We petitioned the SOA Board in May, 2014
- SOA Board approved the Section in June, 2014
- We started recruiting members in July, 2014
- We reached the 200 members needed in 3 weeks and now over 1200 members

Watch for our First Newsletter Issue!

SOCIETY OF ACTUARIES Modeling
Section

The *Modeling* Platform

ISSUE 1 JULY 2015

Agenda

- Background scan
- Applicable Actuarial Standards
- History and status of ASOP on Modeling
- Key elements of the proposed ASOP
- Discussion and reactions

Background Scan

Increasing Scrutiny of Models due to

- Demand for more information
- Role in reporting and risk management
- Complexity & transparency of models
- Human and IT resources consumed
- Reported instances of model failure

=> New focus on **Model Risk**

Model Risk

- Error and/or loss resulting from the use or misuse of models; including
 - Reporting/calculation errors
 - Strategic errors
- May arise from model selection, design, implementation, update, operation

Reference Documents

- Society of Actuaries Research papers:
 - “Actuarial Modeling Controls: A Survey of Actuarial Modeling Controls in the Context of a Model-Based Valuation Framework” by Financial Reporting Section and 2 SOA research committees (December, 2012)
 - www.soa.org/Research/Research-Projects/Life-Insurance/Actuarial-Modeling-Control.aspx
 - “Model Validation for Insurance Enterprise Risk and Capital Models” by JRM Section (April, 2014)
 - www.soa.org/Research/Research-Projects/Risk-Management/research-2014-model-valid-ins.aspx

(Note the list of 16 other reference articles found in this paper)

Reference Documents

- Society of Actuaries published articles:
 - “Model Risk Management for Insurers” in *Risk Management* Newsletter of JRM Section (Mar/2015)
 - “Mind your Modeling” in *Risk and Rewards* Newsletter of Investment Section (Mar/2015)
 - “Controlling our Behavior” in *The Actuary* magazine (Feb/Mar 2015)
 - “Lets Not Reinvent the Wheel” in *The Modeling Platform* newsletter of Modeling Section (July, 2015)

Increasing Attention to Actuarial Modeling SOPs



- 2nd Exposure Draft on “Modeling” - November, 2014
- An Exposure Draft of changes to General Standards of Practice and an Educational Note are pending
- 2014 Statement of Intent re ISAP[5] – “Insurer Enterprise Risk Models” (target date in 2017)
- April 2010 - Generic Technical Actuarial Standard M - Modelling

History and Status of Modeling ASOP

- ASB began review in late 1990's
- ASOP No. 38, *Using Models Outside the Actuary's Area of Expertise*, was approved by the ASB in June, 2000
- Discussion draft *Modeling in Life Insurance and Annuities* released in February, 2012
- Original Exposure Draft *Modeling* released June, 2013
- Second Exposure Draft *Modeling* released November, 2014 (comment period to March 15, 2015)
 - 85 comments on ED's being reviewed
- For ED document and comment history refer to ASB website: www.actuarialstandardsboard.org/asops/modeling-second-exposure-draft

Code of Professional Conduct

- **PRECEPT 1.** An Actuary shall act honestly, with integrity and competence, and in a manner to fulfill the profession's responsibility to the public and to uphold the reputation of the actuarial profession.
- **PRECEPT 2.** An Actuary shall perform Actuarial Services only when the Actuary is qualified to do so
- **PRECEPT 3.** An Actuary shall ensure that Actuarial Services performed by or under the direction of the Actuary satisfy applicable standards of practice.
- An actuary takes responsibility for the quality of his work, discloses the basis of his work and any reliances, uncertainty or limitations in that work.

ASOP 41 – Actuarial Communications

- Actuarial work resulting in advice, recommendations, statements of opinion normally require a formal report stating the actuarial findings, including the methods, procedures, assumptions, and data sufficient that another actuary could make an objective appraisal of the reasonableness of the actuary's work,
- The report should disclose:
 - Uncertainty or risk
 - Reliance on other sources for data and other information
 - Responsibility for assumptions and methods
 - Limitations or constraints on the use or applicability

ASOP 23 Data Quality

The actuary

- decides what data is appropriate for the work
- may rely on others to provide the data, but must disclose that reliance
- should review the data for reasonableness and consistency, taking into account the extent of any checking, verification, or auditing that has already been performed
- should document the sources of data and any reviews performed
- should include key facts about data used in communication of findings, and disclose any concerns, reliances, limitations,

ASOP 38 - Using Models Outside the Actuary's Area of Expertise (P&C specific)

- ASOP 38 prompted by increasing use of catastrophe models to simulate catastrophic events and their resulting costs
 - developed by groups of scientists, engineers, and actuaries
- When using a model that incorporates specialized knowledge outside the actuary's own area of expertise, the actuary should:
 - determine appropriate reliance on experts;
 - have a basic understanding of the model;
 - evaluate whether the model is appropriate for the intended application;
 - determine that appropriate validation has occurred; and
 - determine the appropriate use of the model
 - document and disclose as needed

Scope of Proposed Modeling ASOP

- Scope - applies to actuaries in all practice areas who select, design, build, modify, develop, use, review or evaluate **models** when performing actuarial services.
 - whether or not actuary is part of the modeling team or the model is developed by others outside the organization
 - all models (with appropriate judgement re the extent of reliance by the intended user and the materiality of the financial effect)
- Model definition: “A representation of relationships among entities or events using statistical, financial, economic, or mathematical concepts and equations.”
- **Models** are *simulations of entities, processes or risks* used “to help explain a system, to study the effects of different components, and to derive estimates and guide decisions.”

What Types of Models do Actuaries Use?

- Cash Flow & Financial Models
 - Used for Pricing, Valuation, Financial Projection and Planning, ALM and Risk Analysis
 - Models and submodels
- Risk Models
- Deterministic/Stochastic Models
- Business Data Models (Clustering and Compression)
- Dynamic Policyholder Behaviour Models
- Predictive Models
- Other types?

Key Principles of Modeling ASOP

- Confirm that the model is suitable to its intended purpose
 - The actuary should select, design, build, modify, develop, or use a **model** that meets the **intended purpose**.
- Mitigation of model risk
 - The actuary should examine the potential for **model risk** and undertake reasonable and appropriate steps to mitigate it
 - Perform model validation
 - Checking for reasonableness and integrity using reconciliation, output analysis, peer review
 - Implement appropriate model governance and controls

Key Principles of Modeling ASOP

- Consider all elements of the model:
 - Model design and structure
 - Data inputs to model (reference ASOP 23 – Data Quality)
 - Assumptions & parameters, including experience basis used, margins, range of assumptions, and internal consistency
- Consider all aspects of the model:
 - Model specifications
 - Model implementation
 - Model realization (each actual run)
- Include appropriate detail when reporting findings and disclose all limitations, concerns, reliances

Comments and Concerns

- Is any ASOP really needed? Can the actuary's judgement justify little or no extra work? Is this actuarial work?
- Does the open definition of a model and wide scope of ASOP impact simple calculations in various practice areas?
- What is actuary's duty when relying on others (actuaries or non-actuaries) to develop or maintain the model?
- Clarity of wording for various clauses (depends on practice?)
- Add more discussion of validation and governance? Or focus on principles?
- Probable actions:
 - ASOP will very likely proceed with revisions, possibly with more concrete examples for clarity

- Open discussion?