



AMERICAN ACADEMY of ACTUARIES

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October 14, 2016

Via email to comments@actuary.org

Actuarial Standards Board
1850 M Street NW, Suite 300
Washington, DC 20036

RE: Third Exposure Draft of Proposed Actuarial Standard of Practice on Modeling

Thank you for the opportunity to provide comments on the proposed actuarial standard of practice (ASOP), *Modeling*. The American Academy of Actuaries¹ Casualty Practice Council (CPC) and Committee on Property and Liability Financial Reporting (COPLFR) have reviewed the document and offer the comments below.

Request for Comments

1. Subject to the comments below regarding predictive modeling, the ASOP is otherwise clear in providing guidance to the actuary.
2. Regarding predictive modeling, there are several sections where the guidance provided is not sufficiently clear or conflicts with the terminology generally used for predictive modeling.
 - a. Section 2.11 defines parameters as input to a model, giving as an example coefficients of variables in regression formulas. In predictive modeling, parameters are *output*—the coefficients of the variables in regression formula are the elements of interest. Section 3.4.7 also uses parameters contrary to how the term is generally used in predictive modeling.
 - b. Section 2.7: The concept of “model runs” readily applies to stochastic models where a random number generator produces a different result each time the model is executed. The concept must be stretched to apply to predictive models. In developing predictive models, the life cycle is to specify the model structure, calculate the parameter estimates, review and validate those estimates, and repeat this process until a final model structure is achieved. A “run” might be considered as one cycle of “specify – calculate – review.”

The American Academy of Actuaries is an 18,500+ member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policy makers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

- c. Section 3.4.1: While mentioning “granularity” and “relationships recognized” might be interpreted as a caution regarding overfitting, consider specifically mentioning overfitting, as it is a primary concern in developing a predictive model that meets its intended purpose.
 - d. Section 3.5.1.c: Consider adding additional considerations as examples of items specific to predictive modeling, such as variable selection and how it relates to preventing overfitting of the model.
3. The definition of “model” includes a three-step life cycle. It appears that a simple model would only require phase 1 (specification), and phases 2 and 3 (implementation and production) could be omitted in the actuary’s judgment. If this is consistent with the intention, specifically stating so would be helpful to clarify the definition. For example, a model to derive an estimate of a severity trend could be specified as a method (e.g., linear regression) and data (e.g., claims severity from a specific period of time.) There is no implementation phase as currently defined (i.e., no executable is necessary, only a straightforward calculation) and there is no model run produced (simply the results of a calculation.)
 4. Models are sometimes used generically in a company as part of other work products. For example, rate filings may include profit loads whereby many in the company use the model or model output in their pricing, but the responsibility for that profit load model resides in a specialized area in that company. Each actuary using that model relies on others for validating, maintaining, and updating that model, and are not expected to maintain, test, or validate such a model. They are also not called upon to defend the contribution of that model to the filed price, as that is done by the specialized area. (A similar issue can exist for catastrophe loads in rate filings.)

The ASOP anticipates an actuary relying on others as part of a modeling team, but not as part of a different type of team (a non-modeling team) that relies on a modeling unit as part of the team. Section 3.2 would require each member of the non-modeling team to evaluate the work of the modeling unit of the team. This is burdensome, especially given the number of actuaries in a company who may evaluate the non-profit load piece of a rate filing versus the number involved in that specific modeling endeavor. Each actuary doing a rate filing that relies on a profit model (or a catastrophe model) should not be required to evaluate the major sensitivities and dependencies within that model. Rather, they should be allowed to state reliance on others for that contribution to their work product (e.g., rate filing).

A similar issue exists with regard to NAIC loss reserve opinions for appointed actuaries. In that case an actuary can qualify the opinion as covering only a portion of the overall reserve, with the filed opinion sometimes also including a separate opinion from another actuary for the other part of the reserve (e.g., for P&C companies with material health insurance reserves).

5. There are several definitions that differ between the two proposed ASOPs; e.g., those for “assumptions,” “data” and “intended purpose” in the *Modeling* draft as compared with

that of “project’s objective” in the previously exposed revision to ASOP No. 38, *Catastrophe Modeling (for All Practice Areas)*. These differences do not rise to the level of creating a conflict in the guidance provided.

Specific Section Comments

- We recommend a change to the Section 2.4 definition for “Implementation” as follows:
“Implementation - The process by which an executable form of a model is created.”
- While we appreciate that characterizing mandated inputs or methodologies as “conservative” or “optimistic” may be contentious, we are concerned that the exception noted in Section 3.6.4 for inputs or methodology specified by law may lead to practitioners curtailing necessary disclosures. We suggest adding the following sentence to the second paragraph of Section 3.6.4:
“... The actuary should refer to ASOP 41, Section 4.2 for guidance.”

The CPC and COPLFR members appreciate this opportunity to provide comments to the ASB. We hope these observations are helpful, and we welcome further discussion. If you have any questions about our comments, please contact Marc Rosenberg, the Academy’s senior casualty policy analyst, at rosenberg@actuary.org or 202-785-7865.

Sincerely,

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