



## CAS Task Force to Reply to Modeling ASOP Exposure Draft

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**TO:** Actuarial Standards Board

**FROM:** CAS Task Force to Reply to the Modeling ASOP Exposure Draft  
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**RE:** Comment Letter: ASB Exposure Draft on Modeling, Second Exposure

The CAS Task Force wishes to thank the Actuarial Standards Board for the opportunity to comment on the Exposure Draft. We respect work of the volunteers and colleagues who have put in so much work on the draft with the best of intentions, and whom we thank for their efforts. However, our comments below indicate serious concerns about the impact of the proposed ASOP as drafted and the unintended consequences that would result. We feel that this exposure draft would be inappropriate for many types of modeling that actuaries are involved with.

Our feedback on the draft can be most succinctly summarized as follows. The scope of the proposed modeling ASOP is entirely too broad, although it may be appropriate for a much narrower scope for certain types of models or certain application of models in actuarial work. A single actuarial standard for "Modeling" is of significant concern to our areas of practice, primarily property/casualty. Actuaries in all practices areas use a wide variety of models in their work; our concern is that this proposed ASOP is impractical and inappropriate for the types of modeling work we do every day.

### Summary

The CAS has formed a Task Force to respond to the Second Exposure draft of the proposed ASOP on Modeling. The Task Force thinks that the standard as drafted is misdirected. The goals and uses of different kinds of modeling are too diverse to cover in a single standard. We recommend that this standard be limited in scope to a single type of modeling, such as stochastic solvency modeling, and that future standards address other models in common actuarial practice (such as predictive modeling for risk segmentation, reserve models,

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catastrophe models, etc.) while leaving untouched models that are properly the domain of other disciplines, or that are not central to actuarial practice, but that some actuaries perform in non-traditional roles (direct response models, price optimization models, call center staffing models, premium audit models, claims triage models, etc.). An alternative approach might be to introduce standards of practice around process governance, correlations and interactions, validation procedures. These topics are relevant to all actuarial work, not just to models, and ASOPs governing them could be introduced along the lines of our current ASOPs on data quality and on actuarial communications.

### **The Role of Modeling in Actuarial Work, and the Breadth of the term “Model”**

“Modeling” is too broad a topic to be covered in a single standard and is not exclusively an actuarial discipline. Having a single actuarial standard of practice on “Modeling” could be viewed as similar to having a single actuarial standard of practice on “Programming” or on “Underwriting”. There are indeed best practices for programming, and many actuaries have instituted such standards on their own teams, but it would seem inappropriate to look to an ASOP rather than to professional programmers or an organization like the Association for Computing Machinery as sources for such best practices.

We wondered if the standard would benefit from input or representation from a wider variety of practitioners of different types of modeling. For example, the focus of the standard appears to be much more oriented toward stochastic models than toward predictive models. We note that predictive models are one of the biggest growth areas for actuaries in recent and coming years. “Modeling” is a very general term, and the standard leaves the impression that “modeling” refers principally to specific types of models, while intending to apply to all.

Actuaries compete with other professionals in the predictive modeling and data science arena, and it is crucial that standards that touch this area do not place actuaries at a competitive disadvantage. This standard as exposed would do so. Interpreting this standard for various different types of models can be very difficult. The proposed definition of “model run”, for example, is flawed: In the context of a statistical model, it’s ambiguous as to whether it refers to an estimation run or a scoring run. ASOP #1 (3.1.1) states that “This process of exposure is intended to seek input on the effect that the proposed ASOP would have on the level of practice.” This Task Force’s feedback is that this standard would be a significant detriment to actuarial practice and would make actuaries less desirable as predictive modeling and data science employees.

The wording of 3.1.1 of the proposed ASOP allowing an actuary to opt not to apply the guidance is very broad. Essentially the actuary may decide that guidance in the proposed standard is inapplicable (which the actuary may frequently need to do, based on the foregoing discussion). It would be better not to have a standard on modeling than to have one that requires such a broad exception, because its very existence weakens the other standards.

## **The Effective Scope of the Proposed ASOP is Inappropriately Broad**

We are concerned about the statement of scope in the exposure draft which reads: “This ASOP applies to actuaries selecting, designing, building, modifying, developing, using, reviewing, or evaluating **models** when performing actuarial services.” The exposure draft copies the definition of “principal” (a term of common parlance used with essentially its common meaning) from ASOP #1 but does not incorporate ASOP #1’s definition of the much more obscure phrase “actuarial services”, so we turn to ASOP #1 for the definition of “actuarial services”:

“Professional services provided to a principal by an individual acting in the capacity of an actuary. Such services include the rendering of advice, recommendations, findings or opinions based on actuarial considerations.” This definition is not terribly clear, but since the second sentence is not phrased so as to be limiting, a reasonable construal is that anything done by actuaries in the course of their jobs as actuaries (even if it be non-traditional work like a model to triage claims to claims adjusters, or a call-center staffing model) would be considered actuarial services. That in itself (in ASOP #1) is not a problem: We do want actuaries to follow basic professional standards even in non-traditional practice areas—disclosing conflicts of interest, etc. ASOPs #23 and 41 also apply broadly to work by actuaries and already introduce some constraints on actuaries when they compete with other professionals, such as statisticians and economists, in non-traditional practice areas. The business of the ASOPs is two-fold:

- To define, generally, how actuaries do their professional work. (#1, #23, #41)
- To define, specifically, how actuaries do certain specifically actuarial tasks. (Most others)

The proposed ASOP attempts to define how actuaries should perform a task that is not specifically an actuarial task. This approach is entirely different from the approach, for example, of the recently proposed ASOP on Ratemaking, which, correctly, does not pretend to encompass the broader concept of pricing: Ratemaking (costing) is an actuarial function, whereas pricing involves costing (actuarial services) but also other functions and disciplines, e.g., marketing and underwriting. We quote a comment from Michael J. Miller of EPIC regarding the Ratemaking exposure draft, and his congratulations for avoiding a hornet’s nest that would have made it more difficult for actuaries to effectively and professionally serve their principals:

“My [Michael J Miller’s] career has been characterized as providing both actuarial consulting and management consulting. The actuarial component of my consulting work deals with projecting costs and opining on whether or not rates are reasonably consistent with the actuarial and statutory rate standards of adequate, not excessive, and not unfairly discriminatory. The management component of my consulting work deals with helping insurers design rating plans which are competitive in the markets they serve and will best meet their business objectives. The actuarial profession cannot prescribe recommended practices to insurers and their pricing managers, even if the pricing manager happens to be an actuary. If the actuarial profession does attempt to control the pricing manager’s decisions and business judgments, my recommendation to my clients will be to fill the pricing manager position with a non-actuary.

“I congratulate the Task Force [for the Ratemaking ASOP] on its definition of Ratemaking in Section 2.9. This definition reminds all actuaries that what uniquely defines the actuarial profession, and what gives value to a formal actuarial rate opinion, is the projection of costs. While many actuaries are well qualified to make pricing decisions, so are some MBA’s, experienced underwriters, and product managers. No one but an experienced actuary is qualified to project the costs which should underlie an insurance rate.”

Michael Miller’s full letter is available at

[http://www.actuarialstandardsboard.org/comments/Ratemaking\\_expsoure\\_draft\\_sept2014/comment\\_14.pdf](http://www.actuarialstandardsboard.org/comments/Ratemaking_expsoure_draft_sept2014/comment_14.pdf) .

### **Suggested Path Forward**

If we want actuarial standards governing modeling, we suggest two possible paths forwards:

- More specific standards for specific kinds of models, such as already exist, for example, in ASOPs #13, 25, and 38, and many others. These standards could focus very specifically on the models themselves (as #38 does), or mainly on the area of actuarial activity, with only passing reference as to how models fit in (as #13 does), or could focus both on the actuarial activity and the aspect of that activity as a model (as #25 does).
- Rather than introduce standards specifically governing modeling, introduce standards governing specific topics that are and have been relevant to actuarial practice more broadly but that are especially relevant to modeling. This might also involve minor revisions to standards like #23 and #41.

The first path would be to develop more standards along the lines of #25 and #38 as specific types of models become commonly incorporated in actuarial work. Such standards would focus on the actuarial application, rather than on the process of modeling or the type of model. For example, we would consider a standard on generalized linear models to be inappropriate, but a standard on risk segmentation that included the application of generalized linear models to risk segmentation could be appropriate.

There are two activities that we can see related to the second alternative. One would be to adapt the existing ASOPs that broadly apply to actuarial practice, such as ASOP #41, to improve their applicability to non-traditional or developing areas of actuarial practice. Similar standards of broad application might be needed, but a modeling standard is not. We note that it is becoming increasingly difficult to understand general guidance, such as “another actuary qualified in the same practice area” (ASOP #41, last paragraph of section 3.2) because “practice areas” are expanding and perhaps cannot be simply defined as among the traditional four when the work is highly specialized or multidisciplinary. The second activity would be the creation of standards on specific topics relevant to modeling but applicable to other actuarial work; as candidates for such standards we might identify process testing (expanding 3.3 of the current proposal), validation procedures, correlations and interactions. Each of these topics

could be encapsulated in its own standard. While standards on these topics might take some time to develop, such guidance for actuaries could be very valuable for the actuarial profession.

## Pitfalls and Pratfalls

We are also concerned about the use of unclear phrasing in the proposed ASOP (in the context of all of “Modeling” as a subject) that would be problematic if this standard were approved. Note that our purpose is not to criticize nor to ask that these issues be resolved but rather to suggest and to illustrate how this specific a standard applied to this broad a subject cannot provide effective guidance that is appropriate for all situations. Please note this is not a complete list.

- Definition of “assumptions”: Assumptions are broader than the inputs to a model. Assumptions often drive the choice of the type of model used.
- Definition of “granularity”: The second sentence beginning “Models with a higher degree of granularity may provide more model precision or flexibility...” neglects perhaps the most important drawback of granularity...that a more granular model may be less accurate.
- Definition of “implementation”: For a model that will be broadly used for decision-making within an organization, “implementation” includes socialization, training, and measurements of success. It is hardly ever as narrow as “an executable form”.
- Definition of “model run”: See the discussion above.
- Definition of “parameters”: In statistical models, parameters are estimated from data and are thus output from an estimation process, rather than inputs.
- 3.1.3: It’s not clear what is meant by “When the actuary is part of a modeling team”. Does 3.1.3 imply that when an actuary is the only actuary on a team of ten modelers, the proposed ASOP requires that the actuary confirm that the rest of the team is following this ASOP? This requirement could be quite unrealistic and ignore situations where the work of the modeling team is mainly statistical or economic rather than actuarial in nature. We think there is a larger issue as to whether what that team produces should be considered actuarial work product. An underwriting team that includes an actuary may decide to decline a risk based in part on actuarial input (or not, as the case may be), but the underwriting decision should not be considered, *ipso facto*, an actuarial work product. As actuaries more and more often operate in cross functional teams, the ASB needs to craft standards that reflect the fact that actuaries work in environments that include both actuarial and non-actuarial aspects. This reality is not well served if actuarial standards are written in a way that treats actuarial services as an isolated function. This can be a particular problem in wider applications of modeling.
- 3.2.7: The discussion of margins is problematic when applied to many types of models. Examples include situations of application where one party’s margin is the other party’s loss. Low credibility data could be adjusted toward a broader but less applicable data in the first instance, and margins can often be both explicit and separate from the model. It’s also not always appropriate to adjust an input or an assumption to load for the cost of bearing risk. Explicit risk loads are commonly applied. The specific statement “a margin

might be included [because] the experience data are not fully credible” seems out of place in this ASOP since ASOP #25 on Credibility Procedures recommends many things one might use as “relevant experience” in the presence of data (“subject experience”) that are not fully credible, but none of those things include a margin.

- 3.3: The guidance on mitigation of model risk nowhere mentions out-of-sample testing, commonly used and essential in many modeling domains. (3.3.1.a.3 may appear to come close, but it fails to specify the essential element of testing on data that was not used in the formulation or estimation of the model.)
- 3.4: This entire section discusses models used to present a report rather than to make business decisions. For example, if the goal of a model is to provide information on individual accounts to desk underwriters, rather than to make a board presentation, this section is wholly inapplicable, and yet presentation of results to the intended audience is no less critical to success, regardless of whether the audience is a desk underwriter or a board. A broad standard on modeling would need to acknowledge transactional decision support models.

The CAS Task Force to Reply to Modeling ASOP Exposure Draft again expresses thanks for the opportunity to comment. We believe that the subject of modeling is critical to many areas of actuarial work. Unfortunately, we must conclude that the current draft and the ASB’s general approach to this topic are not viable without major changes. We hope these comments will open up a very important and constructive dialogue that will help the ASB create high quality and useable actuarial standards on this important topic.

With Regards,

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Christopher Monsour, Chair