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Comments from Christopher Monsour, FCAS, MAAA regarding the exposure draft of the proposed ASOP in Modeling.

I appreciate the opportunity the ASB provides for actuaries to comment on proposed Actuarial Standards of Practice. In this case, however, I think the ASB has not made an adequate provision for comments and discourse. If "Modeling in Life Insurance and Annuities", the precursor, deserved a discussion draft, then a standard as broad as this that impacts so many more actuaries and that raises some difficult issues surely deserves a discussion draft. To my mind, those issues include how this standard fits with other standards on models (like the Credibility standard); the language in 3.7.2 papers over the issue—but it should be discussed.

Another issue is how we want these standards to apply to work in which both (some) actuaries and other professionals (e.g., statisticians, economists) are experts. Again, this needs some serious discussion within the profession. In general, speaking as a manager of teams composed of actuaries and other professionals, ASOPs can be helpful, for example, in training staff as to what data checks and documentation are appropriate in insurance work, what constitutes appropriate communication of results, how actuarial terminology works, etc. On the other hand, when ASOPs begin covering topics that those other professionals are more expert on than the ASB is, it runs the risk of detracting from the credibility of the entire body of ASOPs.

It would be a good time for the ASB to reflect and to recognize that some actuaries *are* experts in certain types of modeling in which other actuaries (even other actuaries in the same practice area) are *not* experts. Actuaries expert in other fields may need to follow the standards of those fields when engaged in that work. The ASOPs—and this ASOP in particular—should recognize and allow for this.

Finally, there is a basic matter of professional courtesy: If a new ASOP is going to apply to predictive modeling, then I think the ASB owes the predictive modeling community the courtesy of starting with a discussion draft, as they did with the life and annuities modelers, rather than a exposure draft.

In response to the committee's questions:

(1) *Does the proposed standard provide sufficient guidance to actuaries working with models?*
The question seems to presuppose that not all actuaries work with models. I challenge the Task Force to name one who doesn't. In any event, I don't think sufficient guidance is provided, because it couldn't possibly be. The scope of this ASOP is so broad it can't possibly provide sufficient guidance to one actuary without providing inappropriate guidance to five others. I can think of two ways to bring this under control:

a. Create different standards of practice for different types of models (e.g., predictive models, inference models, financial models, finite-element models, designed experiments). This would allow the standards to use the language of the discipline under discussion. Words like "estimation" and "parameter" have different flavors in different contexts that make the current standard confusing. (In general, there are models where estimation is primarily driven by assumptions and models where it is primarily driven by data.)
b. Create different standards of practice for different aspects of work (e.g., data quality, specification, documentation, validation, and communication). Some of these standards already exist and may need revision. Some would need to be created. But at least a standard of practice on validation would have room for a discussion of what types of validation are appropriate for what types of work. In the proposed standard, validation is covered in sub-sub-section 3.3.1.

(2) *Is the proposed standard sufficiently flexible to allow for new developments?*
In general, I prefer a flexible framework for standards like this. But this standard is so flexible that it is hard to interpret, and thus will be too easily subject to misinterpretation.

(3) *The draft ASOP starts with a wide scope, but allows the actuary to use professional judgment to identify those instances (such as those involving minimal reliance by the user, or resulting in a non-material financial effect) where some guidance described in this ASOP is not appropriate or practical. Is this clear and appropriate?*
A standard that is this broad needs not to be prescriptive, since the prescriptions would be in many cases burdensome or open to multiple interpretations or both. But perhaps the answer would be several standards each having clearer, narrower scope. The irony of the proposed standard is that actuaries who recognize themselves as modelers probably will profit very little from this standard's [rather generic] guidance since their professional judgment about modeling is reasonably sophisticated. It's precisely the actuaries who are not conscious that much of what they do is model-building who might benefit, but, like M Jourdain in *Le Bourgeois Gentilhomme*, they will think this standard does not apply to them.[1]

(4) *In those instances where some guidance described in this ASOP is not appropriate or practical and the deviations from guidance are "not material," the actuary does not need to disclose these deviations. Is this clear and appropriate?*
This is clearly appropriate. The topic of this ASOP is not specific enough for its authors to try to create a detailed norm for how communication with the principal should occur. That would require ASOPs that had more clearly and narrowly defined topics.

[1] Molière, *Le Bourgeois Gentilhomme*, II, iv, where M. Jourdain does not realize that he has been speaking in prose his whole life.

(5) *Appropriate documentation simplifies later use and development of current models as well as allowing easier review by principals and other actuaries. Section 3 contains guidance with regard to documentation. Is this guidance clear and appropriate?*
The documentation requirement is neither appropriate nor clear. It is not appropriate because the requirement that an actuary in the same practice area be able to assess the judgments made is not necessarily realistic, since such an actuary may have no technical knowledge of the type of modeling being employed…that skill is not part of "practice area" usually defined as "life", "health", "pension", or "property/casualty". (Rather than address this issue in this ASOP, it might be better in the long run to address it by revising ASOP 41 or by revising the definition of "practice area".) It is not clear because section 3.7.2 says that this ASOP does not apply if it is inconsistent with guidance from another ASOP. But it's not clear what "inconsistent" means. Does it mean a conflicting instruction or merely a different instruction on the same topic?

(6) *Does the use of bold font to identify defined terms improve the readability and clarity of the standard? If not, what suggestions do you have to improve the recognition of defined terms in the standard?*
Yes, bold font for defined terms is appropriate and helpful, especially in a document like this where such terms could easily be misinterpreted otherwise.

Other observations:

1.4: An effective date four months after approval may not be adequate for some of the complex projects that will be governed by this standard. I would suggest twelve months.

2.2: A definition of data as "usually collected from records, experience, or observation" is defective in two ways: It relies on a definition of "experience"—presumably financial experience such as loss history—that is not the common English meaning (this would be OK if "experience" were elsewhere defined). It also omits experiments and surveys, which are two other key sources of data.

2.3: A key problem with models that are too granular is that they may be *less accurate*. This is an important phenomenon, not a sidelight; not to mention this issue here among the disadvantages of overly granular models is a critical omission.

2.5: Many statisticians would be surprised to learn that parameters are inputs to rather than outputs of their models. This seems to be a situation where the task force was thinking of something like dynamic financial models and forgot that a definition appropriate for one kind of model may be inappropriate for another, where parameters are estimated from the data.

2.10: Do we really want to define "using models" as "modeling"? When an underwriter refers to the results of a predictive model or a catastrophe model as part of his evaluation of an account, is he engaged in "modeling"?

2.11: The traditional discussion of “process risk”, “parameter risk”, and “model risk” is useful and rather generally applicable. I would think the standard would mention all three.

2.12: Consider a claim covered by a reinsurance treaty applying to the layer $900,000 xs of $100,000 on a per claim basis. The claim is currently reserved for $80,000, which, let us say, represents a 90% chance of no payment and a 10% chance of an $800,000 payment. I don’t think the Task Force meant to say that the neutral ceded reserve is $0 since it cannot take into account any adjustment for uncertainty. (Obviously, the expected value of the ceded loss amount is $70,000, but one arrives at that number by taking process uncertainty into account.) Perhaps this definition of “neutral” could be clarified, e.g., “without any adjustment for uncertainty *of the model assumptions*”.

2.15: At least the definition of “Principal” matches that in the Code of Conduct. (This is a big improvement on an exposure draft of another ASOP that had a *different* definition.) But why not just refer to the Code of Conduct for the definition, so that there is no confusion if the Code changes?

3.1.1 In the first paragraph, a “material financial effect” for whom? The principal? The principal’s customers? The general public?

3.1.2 “If the actuary uses a **model** designed or built by someone else, such as a vendor or colleague, there may be limited ability to understand the underlying workings of the **model** and, therefore, full application of the guidance in this ASOP may not be necessary”. What follows after that sentence is *not* a clear statement of what *is* necessary.

3.2.4(c) For “consider documenting” write “document”.

3.2.4(d) Why not “Document material potential limitations” or just “Document material limitations”? And, in any event, isn’t this redundant with 3.4.1(c)?

3.2.7(a)(2) would be charmingly self-referential if this were not a professional standard. *Credibility* (i.e., a process to make adjustments to data that are not sufficiently credible) is itself a model.

3.2.7(a)(4) It’s not entirely clear whom the margin is supposed to protect. This is like asking the actuary to make a “conservative assumption”. Conservative for whom?

3.2.7(c) If *questionable* assumptions are required by legal constraints, disclosure of this and the reasons for it would be appropriate. If *inconsistent* assumptions are required, there’s no point doing the work, since, as a matter of logic, any conclusion whatsoever can be made to follow from inconsistent premises.

3.3.1(a)(3) This really needs a caution to use *out-of-sample* historical data lest the so-called “validation” simply turn into a self-fulfilling prophecy.

3.3.1(b)(3) In common language, a successful “sensitivity test” on a “key assumption” would be taken to mean that minor changes in the assumption resulted in only minor changes in the outputs. Unless a second model is available to assess matters, it’s not clear what is meant by changes in the results that are “consistent with” changes in the assumptions.

3.4.3: No, terms such as “conservative” and “optimistic” may NOT be used. They are notoriously ambiguous and routinely lead to confusion when used.

2.9, 2.17, 3.3.1(b)(2) The definitions of “realization” and “model” in 2.9 and 2.17 would lead one to the conclusion that a realization of a predictive pricing model consists in running a prospective account’s characteristics through the model to obtain an expected cost of writing the account. However, this interpretation makes a hash of 3.3.1(b)(2) on “reconciling” to “prior realizations” (which makes perfect sense for financial models that would have a different interpretation of “realization”).. This is another example of how this standard is overly broad in trying to apply a one-size-fits-all approach to “modeling”.

I hope these comments will enable the Task Force to produce a robust discussion draft for the fuller conversation that this topic merits.

The views herein expressed do not necessarily reflect those of my employer.

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