Comment #14 – 9/9/13 – 8:02 a.m.

These comments refer to the draft Actuarial Standard of Practice on the topic of "Modeling," as approved for exposure by the Actuarial Standards Board in June 2013. They represent the opinions of James R. Braue, A.S.A., M.A.A.A.

After a general comment, there are comments relating to specific sections of the draft, as indicated in the heading of each comment. Finally, there are responses to the specific questions posed by the Modeling Task Force.

General comment.

It is important to remember that when we speak of a "model," we are speaking of an approximation of reality, not the reality itself. Therefore, a model is always in some sense "untrue" or "incorrect," and discussing models as though they were or could be exact representations of reality is misleading. An exact "model" is actually just a calculation or determination that does not involve "modeling" at all.

While that may seem obvious, it is an important enough concept that it probably should be stated somewhere in the ASOP. Note that some of my comments below on section 3.3.1.a involve this consideration directly.

Section 1.2, "Scope."

To the list of "selecting, designing, building, modifying, developing or using," I would add "reviewing." This would make it clear that the peer review suggested in section 3.1.1.c. is also subject to this ASOP, and also make it clear what sorts of activities are anticipated for the peer review.

Section 2.3, "Granularity."

This section suggests that, "models with a higher degree of granularity … may provide more model precision." It should be noted that this is true only if the more detailed cells can actually be modeled more effectively than can higher-level aggregations. Greater granularity may give a false appearance of precision. In the extreme, trying to break down the organization into smaller cells may decrease the reliability of the model because of reduced credibility of the inputs or because correlations among cells can less easily be taken into account.

Section 2.8, "Margin."

It is worth noting that the adjustment for uncertainty is added for purposes of conservatism. It is equally worth noting, however, that "conservatism" will have different meanings depending on the intended application. In some circumstances, a higher number is more conservative, and the margin will be positive; but in others, the conservative value will actually be lower than the anticipated value, and the margin will be negative.

Section 2.12, "Neutral."

It is unclear to me what is meant by, "anticipate expected future experience without any adjustment … for asymmetric alternative outcomes." "Expected" in this context is likely to be read in a statistical sense; if it instead meant "anticipated," then "intended to anticipate expected future experience" would be redundant, meaning the same as "intended to anticipate future experience." If "expected" is interpreted in the sense of "expected value," then it's not clear how that could not reflect "asymmetric alternative outcomes." I suspect that what was intended was a reference to something like utility theory: e.g., a neutral model does not reflect the fact that a loss of a particular magnitude may be much more significant than a gain of equal magnitude. If that is the intended meaning, that needs to be made clearer. If that is not the intended meaning, then please clarify what the intended meaning is.

Section 2.14, "Parameter."

The examples of parameters include "expected values." Does this mean expected value in the statistical sense, or does it mean "anticipated values"?

Section 2.17, "Realization."

This section says that a "realization," as here defined, is also sometimes referred to as a scenario. This may be confusing. In common usage, a scenario more typically denotes a set of inputs; the realization is the "result for this scenario."

Section 2.18, "Reproducible."

This perhaps could be expanded to note that when the model includes pseudo-random inputs, realizations must be identical only when the "seed" for such inputs is the same, not just the parameters of the random distribution (mean, standard deviation, etc.).

Section 3.1.1, "Model Reliance and Financial Importance."

The first paragraph of this section refers to, "when … the model has a material financial effect." More properly, the sentence should say, "when … the decisions that will be based on the model are likely to have a material financial effect." This makes the important point that the importance of the model is related directly to the types of decisions that ultimately will be made based on the output of the model. The model itself does not have any financial effect, other than the cost of running it.

There is a similar problem in the second paragraph, when it refers to "situations where the results … do not have material financial effect." Again, it is not the results that will have a material financial effect; it is decisions made using those results that could have an effect.

Section 3.2.5, "Model Structure."

The distinction between items "b" and "c" is unclear. Doesn't the requirement of a particular level of granularity dictate what grouping can be done; and likewise, if it is determined that grouping will produce reasonable results, doesn't that establish the appropriate degree of granularity?

Section 3.3.1.a, "Model Integrity."

What is intended to be the distinction between items 1 and 3? What are the "actual data" in item 1, if not historical data as referred to in item 3? How, in item 3, are the results to be tested against historical data, if not by a "reconciliation" as in item 1? Some clarification appears necessary.

Item 4 speaks of "reasonable and appropriate steps to … eliminate" model risk. "Model risk" is defined in section 2.11 as, "The risk of adverse consequences to output and decisions as a result of a flawed model, inappropriate inputs, or misapplication of the model." It may not always be clear as to whether a model is actually flawed, because, as noted previously, a model is always an approximation of reality, and will always differ from reality. There is also a potential for adverse consequences from that unavoidable divergence of the model from reality, but that does not seem to be addressed in this item in that it deals only with "model risk." The risk arising from the inherently approximate nature of models can never be wholly eliminated, but it can be mitigated through a careful communication of the limitations of the model, an illustration of the sensitivity of the model to small changes in assumptions, and the presentation of other information that can help decision-makers understand how effectively the

model mimics reality. This is addressed to some extent in section 3.4.1b, but probably should be addressed more fully here or in another item within section 3.3.1.a.

Section 3.3.1.b, "Analyzing the Output."

It is not clear what sorts of activities are encompassed within item 1, "performing analytical tests on model results to assess the reasonableness of the projection." The example given is, "testing for the appropriate application of assumptions," but that sounds more like a check on whether the model has been implemented properly; it is not clear how that will test the "reasonableness" of the output. Either that example should be expanded to clarify what is meant, or additional examples should be offered as further clarification.

Section 3.3.1.c, "Peer Review."

As noted in my comments on section 1.2, there should be further guidance as to what is intended as peer review, particularly that the review should involve performing some or all of the activities described in sections 3.3.1.a and 3.3.1.b, and that those activities are likewise subject to this ASOP.

Responses to questions posed by the Modeling Task Force.

1. Does the proposed standard provide sufficient guidance to actuaries working with models?

Because of the very broad scope of the standard, the guidance is of necessity limited, since it must apply to many different types of models that will be used for many different purposes. However, even within that context, some additional guidance would be appropriate, as indicated in my comments on specific sections of the draft.

2. Is the proposed standard sufficiently flexible to allow for new developments?

I believe the proposed standard is sufficiently flexible. As noted in my response to question #1, I think the guidance provided is for the most part very general, and thus should have very wide applicability.

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?

That is clear and definitely appropriate. Models are used for such a variety of purposes that there must be some "safe harbor" to prevent the requirements for documentation and disclosure from becoming impractically onerous.

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 those deviations. Is this clear and appropriate?

Again, there must be a form of "safe harbor" established, lest the burden of documenting and disclosing exceed the value of the model. I think it is important, though, to stress the caveat stated in section 3.1.3, "Responsibility of the Actuary": "If, in the actuary's professional judgment, circumstances are such that applying some or all of the guidance in this ASOP is not appropriate, the actuary should be prepared to identify such circumstances and justify limiting the full application of the guidance in this ASOP." [Emphasis added.] Even when disclosure is not required up-front, the actuary must be prepared to justify both the deviation from the guidance and the non-disclosure of that deviation.

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?

It is a little misleading for section 3.6 to be titled "Documentation," as there is also guidance on documentation provided in sections 3.2.4.c, 3.2.4.d, 3.2.7.e (also titled "Documentation), and 3.4 (I consider the presentation of the results to be one part of the documentation, since the items in section 3.4 contain important information regarding the model). While the guidance in total may be clear and appropriate, it is not necessarily easy to identify all of it. Perhaps section 3.6 could contain cross references to those other specific sections, rather than solely to section 4.

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?

I think some typographical means of distinguishing defined terms is highly useful. It reminds the reader (or in some cases alerts the reader beforehand) that certain terms have a specialized meaning in the context of the ASOP. This reduces the amount of time checking, "Was there some specific meaning assigned to this term previously?"

I have no opinion on whether bold font, italics, the use of a different typeface, etc., is the most effective way to mark the defined terms.