Comment #8 – 2/25/15 – 10:20 a.m.

To: the Actuarial Standards Board

Below are my comments regarding the second exposure draft of the proposed Actuarial Standard of Practice on the topic of "Modeling," as approved for exposure by the Actuarial Standards Board in November 2014. These comments represent my opinions, and do not necessarily represent the opinions of my employer or any other organization with which I am associated.

My comments first respond to the four questions posed in the Transmittal Memorandum. Following those responses are comments relating to specific sections of the draft, as indicated in the heading of each comment.

Responses to questions posed in the Transmittal Memorandum.

1. Section 3.1.1 discusses situations when the actuary judges whether full guidance is or is not warranted. Is this section clear and appropriate? If not what changes would you suggest?

I believe the section generally is clear, and not only appropriate but necessary to avoid burdensome applications of the ASOP's guidance. I do have some comments on Section 3.1.1, stated below under that heading.

2. Section 3.1.3 discusses the actuary's responsibility when the actuary is part of a modeling team. Is this section clear and appropriate? If not what changes would you suggest?

I think this discussion requires more thought. The actuary's role may be to interact with other members of the team on the overall construction, modification, or use of the model; or the actuary may be charged with developing, maintaining, or operating a particular component of a model, that possibly will receive inputs from "upstream" components, and possibly will provide inputs to "downstream" components.

If the actuary is part of a general team, then the testing and documentation of the model and disclosures regarding the model may be outside of the actuary's control to a large degree. It is not clear how the actuary could ensure compliance with the ASOP, or what the actuary's actions should be in the absence of compliance (e.g., how could the actuary disclose deviations from the standard if the actuary is not presenting a report or preparing documentation)?

If the actuary is responsible for a specific component of the model, then the actuary's responsibility should be limited to understanding enough about the inputs received from the "upstream" components to know that he or she is using them properly; and to communicate enough about the outputs from his/her model to the persons responsible for "downstream" components so that those persons can make proper use of those outputs. Documentation and disclosure may be a part of those responsibilities, within the limited scope just described.

3. Section 3.3.1(a)(2) describes the degree of checking as being dependent on a list of possible factors, and this list includes both the "intended application" and the "project objective," which apply in different stages of modeling, rather than just referring to the "intended purpose," which encompasses either. Is this separate mention of the two possible stages helpful? Would the guidance be clearer if only the term "intended purpose" was used?

I believe the guidance would be clearer if only the term "intended purpose" were used. The definition of "intended purpose" in Section 2.7 makes clear that the term could signify "the intended application or the project objective or both, depending on the actuary's role at the time actuarial services are performed." The language of Section 3.3.1(a)(2) as currently drafted could be read to imply that both types of purpose should generally be considered. To limit the potential for misinterpretation, the section should use "intended purpose," which clearly states that only one of the types of purpose may be relevant.

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

Given the broad scope of the subject of modeling, it cannot be expected that the ASOP would provide more than very general guidance. If anything, there is a danger of the ASOP being too prescriptive if more detailed guidance is added.

Section 2.12, "Parameters."

The definition of "parameters" is unclear to me. They are defined as "input to models that, when varied, result in different model output." Presumably, variations in any model input would result in different model output, or there would be no purpose for the input. Obviously, "parameters" is intended to be more limited in meaning, but the limitation is not clear from the definition as stated. I would guess that, if anything, the significance of parameters is not their variability, but rather that they will be maintained constant over multiple model runs, as opposed to inputs that vary with each run. However, I'm uncertain whether that was the actual intention of this definition. I think clarification definitely is needed.

Also, it seems that parameters would have to be either data or assumptions; it is not clear how a parameter could be determined except as one or the other. Despite this, parameters are discussed as a third category, distinct from either data or assumptions: see especially Section 3.2, "Assumptions and Parameters." Either there should be further elaboration of the distinction between parameters, on the one hand, and data and assumptions, on the other; or parameters should not be referenced as distinct from those other two categories.

Section 3.1.1, "Applicability of Guidance."

There are two considerations I would like to raise concerning applicability of the guidance.

One is the situation, not uncommon, where an actuary is required to give an answer in a very short time. It may not be possible to be rigorous in validating the model, given the time constraints. Also, the answer frequently must be supplied in a short communication, perhaps even orally, limiting the ability of the actuary to provide all of the information required by Section 3.4. Consideration should be given as to whether the actuary can judge in such cases that full application is not necessary, or whether lack of full application must be considered a deviation from the standard; and if the latter, how the actuary is to disclose the deviation, given the constraints on communication just described.

Another situation to be considered is where the actuary is constructing a model to aid his or her own judgment. For example, an actuary might create a model to test the sensitivity of an outcome to a certain assumption; and having concluded that the outcome is not particularly sensitive to that assumption, take no further steps to refine that assumption. The results of the ad hoc model would never be communicated to anyone else, though they would influence the actuary's own conclusions. Is this ASOP applicable at all to such situations? If not, that should be stated clearly. If it is deemed to be applicable, then perhaps it should be stated that full applicability may not be necessary in all such situations, without there being a discloseable deviation from the standard.

Section 3.2.5, "Model Structure."

I continue to be puzzled by the inclusion of both item (b) and item (c) in this section. If one has determined what degree of grouping will produce reasonable results, does that not determine the granularity required for the inputs? Similarly, if one has determined the degree of granularity required for the model, does that not determine what level of grouping will produce reasonable results?

The reviewers of the first exposure draft clearly thought there was a distinction, but the distinction is no clearer in the second draft. To avoid continued puzzlement to persons like me, I request some clarification. My best guess at the meaning is that granularity (in item (c)) is intended to be general — e.g., policy level vs. product level — whereas grouping (in item (b)) is intended to address specific groupings — e.g., how product categories are defined.

If that is the distinction that's intended, it could be more clearly conveyed with language such as the foregoing. If otherwise, some other clarification should be provided.

Section 3.3.1, "Validation."

I have multiple comments addressing various parts of this section.

Section 3.3.1.a states that "the actuary should validate that the model properly represents that which is being modeled." Models will always be imperfect representations of reality, and "proper representation" may suggest a degree of conformity that cannot often be achieved. Perhaps more precise language would be helpful, e.g.: "the actuary should validate that the model represents the phenomenon being modeled with a degree of comparability that is sufficient given the intended purpose of the model." I think "comparability" is a better word than, e.g., "accuracy"; models are inherently inaccurate, but we can strive to make the model output comparable to the real-world outcomes that we are modeling.

I have two comments regarding Section 3.3.1.a.3.

First, testing the model projection results against historical actual results is useful only if the inputs to the model are consistent with the conditions prevailing during the historical period under review. That may require special runs of the model, not directly related to the project objective, to produce comparable output. The current wording may create an unintentional implication that "the model projection results" — presumably those produced to achieve the model's intended purpose — will somehow be consistent with an identifiable period in the past. There should be some clarification that additional model runs may be necessary for purposes of such a test. If that is intended to be addressed by the wording "where applicable," that seems a little too vague for the circumstances.

Second, "testing the model projection results" seems like an approach to "analyzing the output," and perhaps more properly belongs as part of Section 3.3.1.b.

I will note that Section 3.3.1.b.1, which recommends "performing analytical tests on model results," is rather general. In fact, both Sections 3.3.1.b.2 and 3.3.1.b.3 seem like instances of analytical tests that could be performed, and therefore examples of Section 3.3.1.b.1 tests rather than separate categories. If something more narrowly defined is intended by "analytical tests" in Section 3.3.1.b.1, perhaps a definition, or defining examples, could be provided.

I also have a comment regarding Section 3.3.1.b.3. It is not clear to me how "running tests of variations on key assumptions and parameters" will test that "the model has been used correctly." The sensitivity of output to such variations may test whether the model was constructed properly, but it cannot test whether the model is being used for an appropriate purpose, or that the proper inputs are being used. I think the value of such testing is well conveyed by the remainder of the sentence: "to test … that changes in the results are consistent with the changes in those assumptions and parameters." I think the sentence would be improved if the "used correctly" portion were deleted.

Section 3.4, "Presentation of Results."

This section opens, "When the actuary presents results of the model, the actuary should explain methodology." What really is expected here? For example, if the actuary is making a presentation of results to a board of directors, the directors probably will not be interested in hearing about the technical aspects of the modeling. It is far more important that the actuary explain key assumptions and possible limitations, as also required by this section. In fact, that may hold true when the actuary is presenting results to almost any non-actuarial audience, who may have little interest in the methodology used, and little understanding of it when it is explained; again, key assumptions and possible limitations are what such audiences need to hear. Persons who are expected to use or adapt the model themselves certainly would benefit from an explanation of the methodology, so perhaps they could be cited as a specific audience to whom the methodology should be explained. Otherwise, "explaining methodology" may be

useless and even impractical (your audience may keep interrupting to tell you, “We don’t need that; just tell us about the results”).

Certainly, an explanation of the methodology should be required for the documentation of the model, but that is usually quite distinct from a “presentation of results.”

Thank you for your consideration of these comments.

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