

**Comment #26– 5/15/19 – 11:49 p.m.**

Please accept my comments below in response to the 4th exposure draft.

**General**

Several uses throughout the Exposure Draft (ED) refer to "any" in the context of what an actuary "should" do, "should consider" and other references. The implications of this use of "any" presents significant risk to an actuary who is trying to comply with the ASOP, but may be subject to criticism if some aspect of the actuary's work/services is not covered by such work/services. As a result, I contend and I am concerned that the reference to "any" would be onerous to actuaries in practice.

For example, "... whether there have been **any** changes to the model ..." (3.5 d). The word "any" could be dropped without a major detraction from guidance in the ASOP, but the removal would help reduce the possibility of a misinterpretation or unintended expectation that the actuary would need to show a high level of thorough diligence in identifying and evaluating such changes.

I recommend that the ASB eliminate all of most of the uses of "any". These appear in the draft as follows:

3.1.2 "should make reasonable efforts to ensure that **any** revisions to the input ..."

*Comment: The unqualified reference to "any" may create unreasonable expectations by users of the actuary's services.*

3.1.3 (c) "**any** limitation of data or information, time constraints, or other practical considerations ..."

*Comment: The unqualified reference to "any" may create unreasonable expectations by users of the actuary's services.*

3.1.6 (d) "If the actuary is aware of **any** material inconsistencies among ..."

*Comment: the qualification of "any **material**", or alternatively "any **significant**", are a reasonable alternatives to eliminating the term "any".*

3.1.6 (d) "the actuary should disclose the inconsistencies and **any** known reasons for the inconsistencies ..."

*Comment: the qualification of "any **known**" would not be a reasonable alternative to eliminating the term "any".*

3.3 "If the actuary relies on a model designed, developed, or modified by others, ... , the actuary should disclose the extent of **any** such reliance."

*Comment: the reference to "any **such** reliance" would not be a reasonable alternative to eliminating the term "any".*

3.4 (b) "... including **any** known significant differences of opinion ..."

*Comment: the qualification of "any **known**" would not be reasonable alternative, but the qualification of "any known **significant**", or would be reasonable to eliminating the term "any".*

3.4 "The actuary should disclose the extent of **any** such reliance."

*Comment: the reference to "any **such** reliance" would not be a reasonable alternative to eliminating the term "any".*

3.5 (d) "whether there have been **any** changes to the model or the model environment ..."

*Comment: The unqualified reference to "any" may create unreasonable expectations by users of the actuary's services.*

3.5.1 (c) "given **any** changes in assumptions and parameters used ..."

*Comment: The unqualified reference to "any" may create unreasonable expectations by users of the actuary's services.*

4.1 (c) "... **any** known reasons for such inconsistencies ..."

*Comment: The unqualified reference to "any" may create unreasonable expectations by users of the actuary's services.*

4.2 (b) "... thereby disclaims responsibility for **any** material assumption, parameter ..."

*Comment: the qualification of "any **material**", or alternatively "any **significant**", are reasonable alternatives to eliminating the term "any".*

Several uses throughout the Exposure Draft (ED) of the phrase "if any" in the context of referring to non-applicability of the guidance where there is no elements that relevant. I recommend replacing the phrase with "if applicable" or "as applicable". In several cases the question is not just whether a condition exists or not, but rather whether the guidance applies to a specific situation. As a result, I am concerned that the reference to "if any" would be onerous to actuaries in practice because it can imply an obligation to test for the specific condition as referenced. Replacing this phrase with "if applicable" or "as applicable" allows for situation where judgment is needed to assess applicability, as opposed to whether condition exists or not.

## Section 2 Definitions

2.2 Data - The drafted definition is too vague and general with respect to what kinds of data the ASOP addresses. The ASOP should refer specifically to **quantitative** or **numerical** with respect to data and to model input and output. Data which fits into the expansion of Big Data and Data Science. Such expansions include data which can be video, other visual elements, sound, text, speech, language, etc. The scope of this ASOP should be limited to quantitative models and the relevant data needed to build, use, and test models.

2.7 Model - The drafted definition is too vague and general with respect to what kinds of models the ASOP addresses. The ASOP should refer specifically to **quantitative** or **numerical** models with respect to data, parameters, input and output. Models that fit into the expansion of Big Data and Data Science can include both quantitative models and other models, such as decision algorithms. Some of these other models can be directive in how the output is applied. The scope of this ASOP should be limited to quantitative models and the relevant applications consistent with the intended purpose. The scope of the "models" covered by the ASOP should explicitly exclude algorithmic decision making and other forms of artificial intelligence.

The drafted definition is described in terms of three components, including "a results component, which translates the output in to useful business information." This description seems to sweep in non-quantitative output, as previously mentioned to include decision algorithms. The scope of the ASOP

should be limited to quantitative output or perhaps other types of output based directly on quantitative values.

The drafted definition also describes the use of models "to help explain a system, to study the effects of different parts of a system, to predict the behavior of a system, or to derive estimates and guide decisions." In particular, it is unclear and potentially confusing what is meant by "predicting the behavior of a system." The scope of this definition of a model, and how models are used, should be limited to quantitative models (e.g., estimates) or perhaps other types of models based directly on quantitative values.

2.8 Model Risk - reword for better clarity as follows: "The risk of adverse consequences resulting from reliance on a model that does not adequately represent that which is being modeled or **the risk of misuse or misinterpretation.**"

2.9 Model Run - Replace "selection of input" with "set of input"

2.10 Output - Adjust definition in terms of quantitative values. Eliminate "qualitative criteria on which decisions could be made.", which is much too vague and may include unintended application of the ASOP.

2.12 Parameter - Adjust definition in terms of quantitative values.

### **Recommended Practice**

3.1.1 Designing, Developing, or Modifying the Model - replace phrase "include but are not limited to" with "for example". This replacement would reduce the chance of misinterpretation of the guidance in terms of what the actuary is obliged to do.

3.1.2 Selecting, Using, Reviewing, or Evaluating the Model - Rephrase "the actuary should confirm the model reasonably meets the intended purpose ..." Confirm connotes a specific process. Better wording/phrasing is needed. Perhaps "should review that the model is reasonable with respect to meeting the intended purpose ..."

Rephrase "... the actuary should make reasonable efforts to ensure that any revisions to the input and ... are consistent with the intended purpose." Ensure is too strong - connotes a guarantee. Better wording/phrasing is needed. Perhaps "to consider whether the revisions to the input and ... are consistent with the intended purpose."

3.1.3 Understanding the Model - Rephrase section along the lines of the rewrite below:

When providing actuarial services which depend significantly on the use of one or more models, the actuary should understand the important aspects of each model being used, such as:

- a. basic operation of the model, significant dependencies and sensitivities among variables or parameters, input and output, in the model;
- b. significant known limitations with respect to assumptions and parameters used as input, with respect to the data, information or methods used to build, calibrate, test or validate the model, or with respect to other considerations known to pose material implications when using the model or interpreting model output; and

- c. significant limitations with respect to a material impact affecting the ability of the model to meet its intended purpose due to other practical considerations, such as data issues, incomplete information, time constraints, etc.

3.1.4 Model Structure - This section of the draft ASOP contains descriptions of 5 areas that the actuary "should consider." Each of these 5 areas described are non-trivial in terms of how the actuary would consider each of them, how the actuary should document the extent of the considerations, and what steps are needed to ascertain the appropriateness of a model for the intended purpose. I recommend that the draft language be changed to "may consider" rather than "should consider." This change will help reduce the possibility of a misinterpretation or unintended expectation that the actuary would need to show a high level of thorough diligence in assessing the structure of the model. The guidance in the ASOP should not create onerous requirements for the fairly routine use of models.

3.1.4 Subsections a, d, e - Reword for better clarity as follows:

"(a) whether there are specific provisions and risks reflected in the model which are material and appropriate to the use of the model, for example, differences by business segment, contract or plan;"

"(d) whether there is a significant and material risk of overfitting the model with the available data;"

"(e) whether the model appropriately reflects the existence of significant options or features, which may apply, that could be reasonably expected to have a material effect on the output of the model. Examples include call options on fixed income assets, policyholder surrender options, and early retirement options."

3.1.6 Subsection (a) (1) - Reword for better clarity as follows:

"(a) (1) actual experience adjusted to current conditions where applicable, to the extent that adjustments to the data are considered to be available, relevant, and sufficiently reliable;"

3.1.6 Subsection (a) (3) - "market data" needs to be defined - the meaning is not readily apparent for P&C

3.1.6 Subsection (b) - "Margins" really need to be defined - are they always an add to expected (mean) values? - Shouldn't the ASOP require disclosure of all margins used in model inputs or model outputs? Shouldn't the ASOP require disclosure of the estimated impact of all margins, in the aggregate?

3.1.6 Subsection (c) - Range of Assumptions and Parameters - Why are the number of model runs relevant to the range of assumptions and parameters?

3.1.6 Subsection (d) - Consistency - The ASOP should provide more specific guidance with respect to whether "assumptions and parameters for the model are reasonably consistent." Just requiring the actuary to "use or confirm use" is very weak guidance. Why shouldn't the standard be something like "not unreasonably inconsistent" in order to indicate that consistency in this context of subject to considerable judgment?

3.1.6 Subsection (f) - Reasonable Model in the Aggregate - Reword for better clarity as follows:

"The actuary should assess whether the assumptions and parameters are reasonable in the aggregate. The actuary should consider those assumptions and parameters which might appear to be reasonable individually, but would produce unreasonable output, due to conservatism or optimism in multiple assumptions and parameters."

3.5 Mitigation of Risk - Subsection (d) - Reword for better clarity as follows:

"(d) whether there have been significant changes to the model or to the underlying environment, conditions, experience, or process for which the model was designed; and"

3.6 Documentation - The draft includes the provision that the documentation should allow another actuary qualified in the same practice area "could assume the assignment if necessary." This provision could be onerous in many cases and assumes that the actuary who performed the work would not be available to transfer knowledge and practical considerations. This ASOP should not expand upon general documentation requirements in this way. The other provision in the draft ASOP is sufficient - that "another actuary qualified in the same practice area could assess the reasonableness of the actuary's work."

4.1 Required Disclosures in an Actuarial Report - It should be made clear that the ASOP does not require an actuarial report with respect to the models used by the actuary.

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