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May 15, 2019

Actuarial Standards Board  
1850 M Street NW, Suite 300  
Washington, DC 20036  
Via email to [comments@actuary.org](mailto:comments@actuary.org)

**Re: ASB Comments—Comments on Fourth Exposure Draft of the Modeling ASOP**

Members of the Actuarial Standards Board:

The Pension Committee of the American Academy of Actuaries<sup>1</sup> (the Committee) is pleased to present the following comments to the Actuarial Standards Board (ASB) regarding the fourth exposure draft of *Modeling*, a proposed actuarial standard of practice (ASOP). Although we believe much good work has been done to improve the clarity of the proposed ASOP, we have some comments on the current exposure draft.

Following are our specific comments on various sections of the proposed ASOP:

- Section 1.2—We have several comments on the scope of the proposed ASOP as described in this section:
  - This section defines the scope to include situations when an actuary “uses” a model, but we are unclear as to exactly what that covers. For instance, an actuary will sometimes perform a high-level review of the output (or perhaps only the actuarial communication that will deliver the results to the intended user) for reasonableness and other criteria. Consider an actuary who is performing a high-level review of the work of another actuary at the same firm. We are concerned that the standard could be construed as to apply to the reviewing actuary, even though the reviewing actuary in this case is “using” the model only tangentially. This could create an unnecessary and duplicative level of model review, as the primary signing actuary must comply with this standard with respect to the model

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<sup>1</sup> The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

and will be better positioned to assure all the applicable requirements have been satisfied. We believe actuaries who are not reviewing the model itself, but who are only reviewing or using the output, should not be charged with applying this standard, and that the standard should state so explicitly.

- In the second sentence of the second paragraph of Section 1.2, the proposed ASOP indicates that the reviewing or evaluating actuary should “use the guidance in this standard to the extent practicable within the scope of the actuary’s assignment.” This wording is not sufficiently clear to indicate what guidance in the standard the actuary should use. For example, the prior sentence indicates that the actuary “should be reasonably satisfied that the actuarial services were performed in accordance with this standard.” It’s not clear whether the second sentence requires the actuary to do more than described in the prior sentence and, if so, what. If the point of the paragraph is to simply say, “If the actuary’s actuarial services involve reviewing or evaluating a model, the reviewing or evaluating actuary should be reasonably satisfied that the actuarial services were performed in accordance with this standard to the extent practicable within the scope of the actuary’s assignment,” then it would be helpful to restate accordingly.
- The first sentence of the third paragraph of Section 1.2 appears to use “rely” and “use” interchangeably. We are not clear as to whether those two words are intended to mean the same thing (here and throughout the proposed ASOP). If so, we recommend the words “use of” in the sentence be changed to “reliance on” to avoid any suggestion that there is a distinction between use and reliance. In addition, we suggest the tense of the sentence be changed to reflect the fact that the intended user *will* rely on the output of the model after the actuary complies with this ASOP and delivers the work.
- The fifth paragraph of Section 1.2 begins with the sentence “The actuary should understand the extent of the actuary’s responsibilities.” We think this is a broad statement that applies to all actuarial work, and that calling it out here—but in no other ASOP—might imply that the concept does not apply for any other ASOP. If the point of the paragraph is to simply say, “The actuary should understand whether the actuary’s responsibilities extend to performing actuarial services related to an entire model or to a small portion of a model. This standard only applies to the extent of the actuary’s responsibility,” then it would be helpful to restate accordingly.

- Section 1.4—We believe that the effective date language needs to be more descriptive because as written, it leaves many questions. For example, assume the ASOP is adopted on April 1, 2020, and thus is effective on January 1, 2021:
  - If the model was run prior to January 1, 2021, but reviewed after that date, how should the standard be applied?
  - If the model was selected prior to January 1, 2021, but used after that date, how should the standard be applied?
  - If the model development takes place beginning in 2020 but is finished in 2021, how should the standard be applied?
  - If results of the model were communicated to the intended user prior to January 1, 2021, but additional results based on a change in assumptions or parameters are communicated after January 1, 2021, how should the standard be applied?
  
- Section 2.1 defines an assumption as an input to a model, but doesn't note that an assumption itself can be output from another model. This is not necessarily a flaw in the definition; however, Section 2.7 describes three types of model inputs: assumptions, data, and sometimes parameters. The definitions for data and parameters both state that these inputs can be produced from other models. For consistency, we suggest Section 2.1 be changed to note that an assumption can be produced as output from another model. Alternatively, the definitions of data and parameter in Sections 2.2 and 2.12, respectively, could be changed to remove any reference to these items being produced from other models.
  
- Section 2.6 defines an intended user as “[a]ny person whom the actuary identifies as able to rely on the actuarial findings.” This definition is identical to the one in ASOP No. 41, *Actuarial Communications* (except for the correction of a slight grammatical error) and in other ASOPs. However, since that definition was first adopted, significant confusion has arisen, caused by two words in the definition:
  - a. Able. This is like “can” vs. “may.” Does “able” mean capable? Or does it mean permitted? If it is “permitted,” we don't see this as a problem, and we don't have to worry about the second confusing word because we'll specify who's permitted. If it's “capable,” then the term could encompass a large number of people.
  
  - b. Identifies. Does “identifies” mean “named”/“indicated”? Or does it mean “ascertained”? If it means “named,” this is workable because we can just specify the intended users who can rely on the report. But if it means “ascertained,” we are again faced with a large number of people. (We could ascertain a great many people who might want to rely on the information, and, if they're capable, they might do so even though, in the actuary's mind, those people were never intended users and were not identified as such in the scope of the actuarial findings.) For

example, many individuals may want to rely on our pension results as they appear in a company’s financial statements when deciding whether to buy that company’s stock, but the broad public is generally not identified as a user in an actuary’s pension valuation report. Requiring the actuary to evaluate and address this broader universe of people would create an unreasonable burden on the actuary.

We believe the intent when adopting the original language was permitted/named, and as such suggest modifying the definition of intended user to something such as:

“Any person whom the actuary has indicated is permitted to rely on the actuarial findings.”

We also suggest that, in order to avoid the confusion inherent in the current language, this revision to the language be included in all ASOPs. We understand that’s a complex process, but it’s not one without precedent, and we believe it is very important to clarify this phrase for the actuarial profession.

However, if the definition of “intended user” is not updated, we suggest the scope of this proposed ASOP be clarified to only apply to the intended users that the actuary expects to rely on the model output and not a broad universe of individuals who could potentially rely on the model output if they somehow got access to it. See proposed updated wording to the third paragraph of Section 1.2 reflecting these comments:

“The guidance in this ASOP applies when, in the actuary’s professional judgment, **intended users** of the **model** identified by the actuary will rely on the **output** of the **model**, and their reliance on the **output** of the **model** will have a material effect for the **intended user**.”

- Section 2.7
  - We suggest the first sentence be changed to include “contractual” as a type of input, for consistency with Section 2.12. Additionally, in our comment letter to the third exposure draft, we suggested adding “actuarial” to the list, but this comment was not addressed in Appendix 2. Even though it may seem tautological that an ASOP on modeling would cover actuarial models, we believe it’s important to explicitly include actuarial models—those that rely on specifically actuarial concepts, such as mortality theory—in this list because this is a standard for the actuarial profession.
  - The last sentence uses the word “system” three times, but that term is not defined, and we believe the word in an actuarial context may be ambiguous to many actuaries, including pension actuaries who generally do not use this word. We suggest a new definition be added to the ASOP to clarify what this word means.

(We note that the proposed ASOP defines “input” and “output,” which are arguably more straightforward.)

- Section 2.10—This definition includes only four possible uses of output: point estimates, ranges, parameters for other models, or qualitative criteria for making decisions. Section 2.7, however, also discusses the use of a model for explaining a system or predicting its behavior. We suggest Section 2.10 be changed to be consistent with Section 2.7. We also note that 2.10 only mentions parameters as output that might be used as input to other models, while different sections of the proposed ASOP also mention data and assumptions as possible model outputs that can be used as input to other models.
- Section 2.12—We suggest adding the phrase “(that is not data or assumptions)” after “contractual input” in the first sentence. Similar to our comment on Section 2.7, we suggest adding “actuarial” to this list of types of inputs, to account for actuarial assumptions used as parameters.
- Section 3.1.1—This section would provide that when the actuary designs, develops, or modifies a model, the actuary should consider several factors, including the “dependencies recognized.” The meaning of “dependencies recognized” is not clear and, therefore, it requires additional explanation.
- Section 3.1.2—This section would provide, in part, that when the actuary uses a model that “any revisions to the **input** and formulas, documentation, **governance and controls**, validation, and presentation of **output** are consistent with the **intended purpose**.” We believe that it would be appropriate for the ASOP to require the actuary to make reasonable efforts to ensure the model is consistent with each of these—except for “governance and controls,” which in many situations will be set at a firm-wide level and are not available for an actuary’s review (for instance, when an actuary uses its firm’s actuarial valuation software). Further, although we agree that governance and controls may affect the actuary’s ability to rely on the model, we do not believe these factors would affect the model’s inherent consistency with its intended purpose. We believe the ASOP should contain a separate section describing what an actuary should consider with respect to governance and controls for models.
- Section 3.1.3
  - The first sentence refers to the “results of the **model**,” but it may be more appropriate to refer to the term “output” defined in Section 2.
  - Paragraph (b)—This paragraph would require the actuary to understand, in part, known weaknesses in “methods” of the model that would have material implications. We request clarification of the meaning of “methods” in this context.

- Paragraph (c)—We don’t think it’s appropriate to include “time constraints” in the list of items that might affect the model’s ability to meet its intended purpose. Rather, we believe that time constraints should relate to the *use* of the model and not the *understanding* of the model.
- Section 3.1.4—The first sentence provides that “[t]he actuary should assess whether the structure of the **model** (including judgments reflected in the **model**) is appropriate for the **intended purpose**.” We believe this section should clarify when the actuary should make this assessment—when designing, developing, modifying, selecting, using, reviewing, or evaluating a model, or only when doing some of those actions. Also, we believe it would be helpful to clarify what is meant by “judgments reflected in the model” that actuaries would need to assess. Lastly, we do not understand the meaning of the word “structure” in this context. We believe that eliminating “the structure of” from the stem would not change the guidance and could prevent confusion/misinterpretation.
- Sections 3.1.6(b) and (c)—These paragraphs provide that the actuary may consider including margins or a range of assumptions. We believe that it should be clarified that these paragraphs apply *only* to the actuary *using* a model.
- Section 3.4—While in general we have no significant concerns with Section 3.4, we are concerned that it will become cumbersome, confusing, and misleading in certain circumstances when the expert is employed by the same firm as the actuary. This can best be explained with an example.

As is the case in many areas of practice, in the pension field, larger companies often contract with actuarial consulting firms to provide actuarial reports detailing information about the financial status of their pension plans. The consulting firms in turn employ actuaries who operate under the firm’s guidelines to produce those reports. The report is signed by at least one actuary, and the signing actuary(ies) is/are obligated to follow professional standards. However, from the client’s perspective, the report comes from, and is backed by, the firm and not necessarily the individual signing actuary(ies).

In the course of preparing many actuarial reports, the pension actuary may rely on output from an internally produced econometric model that was primarily, or perhaps entirely, developed by experts in another field (e.g., economists). This reliance may be required by the firm. This raises several questions about how to apply the proposed ASOP.

First, individual actuaries are unlikely to have the knowledge, expertise, or information required to assess (a) through (d) of Section 3.4. Instead, they will rely on firm management or other designated employees of the firm to have done the appropriate due diligence to be sure that the model is appropriate and accurate for those purposes. This isn’t necessarily a problem, because the first sentence of Section 3.4 says the actuary

“may consider” the items in (a) through (d), so actuaries are not obligated to actually assess any of those items. The actuaries are then relying on the model simply because their principal—the firm—told them it was acceptable to do so.

However, the proposed ASOP then says that the actuary must disclose in the report the extent of the reliance on internal experts. This disclosure may confuse the client, who believes they have hired the whole firm, including all its internal resources. The client may even wonder why the firm thinks it needs to provide this disclaimer at all, and if there is something out of the ordinary going on. We also believe this section, as written, would be cumbersome because of the large number of parties that may be relied upon who would need to be included in this summary of reliance.

We recommend the requirement to disclose the extent of any reliance be limited to situations where the experts were not employed by the actuarial firm issuing the report. This change would eliminate the issues brought up in this example.

- Section 3.3—This section can also produce a situation similar to the one discussed under Section 3.4 above. Consider a change in the example so that the model is developed by other actuaries in the firm and has been thoroughly tested by those other actuaries. The signing actuary does not have access to source code but understands in general how the model should operate and does have the ability to test the results for accuracy. As in the above example, the firm may mandate that the actuary use the model.

The proposed ASOP indicates that, if the actuary relies on a model about which the actuary has a limited ability to obtain information or to understand its underlying workings, the actuary should disclose the extent of that reliance. It isn't clear whether the intent of the sentence is that the actuary should disclose reliance if they can do neither, or if they can do one but not the other. This should be clarified.

In addition, it is not clear whether “a limited ability ... to understand the underlying workings of the model” would include a situation where the actuary cannot review programming but can understand what the model is intended to produce and can verify reasonableness. This should be clarified.

Also, similar to the concern about confusion described in Section 3.4 above, a communication from the firm to the client containing a statement of reliance on the firm's own software or on other actuaries who work for the firm would be confusing for clients. We believe that no statement of reliance should be required in this case.

Finally, please clarify what is meant by “dependencies” in Section 3.3(c).

- Section 3.5—This section provides, in part, that the actuary should “evaluate” model risk. Evaluate implies a quantitative process. We do not believe that mandating quantitative assessment is—or should be—the intent of the standard, and in order to avoid confusion, we recommend replacing “evaluate” with a term such as “understand.”
- Section 3.5.1
  - The first sentence distinguishes between a “**model run**” and a “set of **model runs** generated at one time or over time” when the actuary performs testing of the model. Please clarify how the actuary’s responsibility for testing the model would differ between the two scenarios. For example, if an actuary has complied with the ASOP with respect to a model run, and several months later decides to make one small change to the model and reruns the model, does the actuary need to again comply with the entire ASOP, or is there a more abbreviated compliance that may apply to this model rerun?
  - Paragraph (c)—This paragraph provides that, when reconciling model output to a prior model run, the actuary would consider “any changes in **assumptions** and **parameters** used as **input, data**, formulas...” To be consistent with the definition of “model,” we believe “data” should appear before “input.” For example, “any changes in **assumptions, data**, and **parameters** used as **input**, formulas...” Also, “formula” does not appear in the definition of “model” in Section 2, which uses the term “processing component” instead. Because the term “formula” is more intuitive, we recommend keeping that term in this paragraph and changing the definition of “model” in Section 2 to use “formula” instead of “processing component.” However, we suggest consistency in terminology for this concept regardless of which word/phrase is selected.
- Section 3.5.3—We recommend striking this section. Actuaries can always consider having another professional review their work. As written, this section provides no guidance, and we don’t believe any is needed in this area.
- Section 3.5.5—We think this is already handled in the stem of 3.5 and this section should be removed. No repetition is needed.
- Appendix 1—While we generally appreciate the inclusion of a background section, we believe this appendix is inappropriate as written. Far too much of the language sounds like pseudo-guidance. Although the first paragraph is fine, in the second paragraph we do not think the first sentence should discuss what actuaries do. We believe indications of what actuaries do or should do belongs in the ASOP itself, not in the background/appendices. And while explaining limitations of models is fine, the last sentence of the paragraph sounds as though it is providing disclaimer language, which we do not believe is appropriate in an appendix. The third paragraph would be fine except



that we think the first sentence belongs either in scope, purpose, or, more likely, nowhere. In the fourth paragraph, we believe that indications of commonality are more appropriate for a practice note rather than in an appendix to an ASOP, which should discuss principles of actuarial practice. The last sentence before “Current Practices” also sounds like guidance. We think the entire “Current Practices” section belongs in a practice note, if anywhere.

However, if it is decided to keep this information in an appendix, we have the following comments:

- It appears as if the wording in the appendix was not updated to reflect changes made from the third to the fourth exposure draft of the proposed ASOP. For example, the last bullet on page 10 used the word “implementation,” which was removed from this draft (see comment in Appendix 2 on Section 2.4).
- We suggest the second-to-last bullet be changed to “plans for periodic updating *and testing* of model input.”
- We suggest the title on page 11 be changed from “Current Practices” to something more in line with what is discussed in the paragraph, such as “Using Margins.”

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We appreciate the ASB giving consideration to these comments. Please contact Monica Konaté, the Academy’s pension policy analyst ([konate@actuary.org](mailto:konate@actuary.org); 202-223-7868), if you have any questions or would like to arrange a convenient time to discuss this matter further.

Respectfully submitted,

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American Academy of Actuaries