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Dear Louise

Consultation Paper: Generic Modelling Standard

PwC supports the introduction of a generic Technical Actuarial Standard (TAS) on modelling and are pleased to be given the opportunity to provide comment on the proposals in the consultation paper, which has taken account of the views of both our Insurance and Pension Actuaries. We hope our comments will be helpful and look forward to commenting on the Exposure Draft when it becomes available.

We agree with the approach that BAS is suggesting, although we have a number of detailed comments on the principles proposed and questions raised in the consultation paper. In particular, we think it is essential that there is flexibility to be allowed to follow the Standard in a proportionate way, taking into account the materiality of the advice in the hands of its recipient. We agree that individual actuaries should exercise their judgment in a reasoned and justified manner when deciding upon areas of materiality, reasonableness and relevance and we are concerned about the extent to which prescriptive principles can be put into place to provide a framework for actuaries developing or using models.

We also encourage BAS to consider the implications for providers of actuarial information in having to comply with 3 generic standards (covering Data, Modelling and Reporting), together with possible work area related standards. In particular, we recommend that there are explicit boundaries for each TAS, so it is clear where the impact of one TAS stops and the next one begins.

One area where we feel additional guidance is needed is in ensuring that the users of actuarial information are clear about the purpose for which the model can be used, the limitations on both the model and the outputs that have been produced for the specific purpose and on the impact of any assumptions or estimates that have been included. We feel there can be significant risk that models do not provide the information that the user wants and that it may not be clear to the user whether the information provided is suitable for the use to which they wish to put it.

A second area that we feel requires additional consideration is the risk that, by putting more formal documentation and structure around models and the analysis of model results produced by actuaries, there may be an unintended side effect of artificially raising the user's perception of the credibility of results to a level greater than is warranted by the underlying model itself. We therefore feel that the references to limitations should be strengthened.

There is confusion within the Modelling TAS on the difference between the documentation and the assumptions in relation to:

- Design and build of the Model
- User and maintenance guides, including descriptions on how to parameterise and run the model
- Documentation for the lay reader, to provide an explanation of what purposes the model is designed for, and how it meets those purposes
- Justification for the assumptions used to provide actuarial information from the model

These are entirely separate, but there is often little distinction in the consultation paper. There is also limited recognition that the builders of the model are often not those who then run the model to subsequently produce the actuarial information for others. This will result in a requirement for specific documentation to enable those producing the actuarial information to understand how the model runs and the limitations that exist.

The appendix contains our answers to the more detailed questions BAS asks in the consultation paper. Please contact me if you would like to discuss our comments in more detail.

Yours sincerely

Brian Purves
Partner

Questions Raised in Consultation Paper

We have responded below to the individual questions raised in the TAS. However, we have agreed a number of generic comments that, whilst they are referred to in some points below, could have impacts across a number of other questions as well:

- In many areas of the consultation paper, there is confusion between the purpose and readership of the documentation. It is not clear who the audience for the documentation is meant to be aimed at and therefore the level of complexity that is acceptable, nor whether the purpose of the documentation is to define the rationale behind certain decisions or to provide information on how to run and interpret the model.
- There are a number of examples used in the consultation paper, some of which, such as P-Spline in 4.3, many lay readers will not be aware of. It would be helpful in the TAS to ensure that examples used will be understood by the readership of the TAS.

1. Will the proposed purpose of the modelling TAS as set out in paragraph 2.9 help to ensure that users of actuarial information can place a high degree of reliance on its relevance, transparency of assumptions, completeness and comprehensibility?

We do not have particular concerns around the wording of paragraph 2.9. However, there is a risk, as demonstrated by the use of the words “high degree of reliance” in this question, that there will be an assumption that models meeting the modelling TAS will be accurate and reflect what is happening, or going to happen, in the real world. The reality is that models are just an interpretation, generally simplified, of the real world and do not claim to provide an accurate representation in all situations. The key issue is that, even meeting this purpose statement, the model and the supporting information may not provide the intended users with enough information to enable them to provide a robust challenge to what they are being told or to evaluate whether the information is valid in the situations for which the output is intended to be used. We would therefore recommend a further point e):

- e) contains sufficient detail to allow challenge by the person or entity for which the information is intended

In many cases, the purpose of the model is to investigate uncertainties and to provide a range of sensitivities that will inform the user of the actuarial information. We do not believe this is sufficiently brought out in the definition.

In addition the purpose seems to implicitly assume that the model provider also provides the information to the user of the information. There will be a number of cases where there is an intermediary, such as someone who uses the model output to produce a report for the user.

2. Will the definition of a model given in paragraph 2.13 encompass the full range of models that contribute to actuarial information?

As the consultation paper points out, there are a number of different definitions of a “model”, some depending on the use to which it is put, as well as the scope of the environment covered by the definition.

Our concern with attempting to provide an all encompassing definition is that it is trying to be all things to all men. A model could be a simple excel spreadsheet, a complex economic model covering the (projected) business of a large multinational insurer or the valuation and funding of the investments and liabilities of a large pension scheme. Each of these models has different challenges and different scales of complexity.

With this caveat, the definition provided is the lowest common denominator of what a model should consist of. However, it does not, in our view, bring out clearly enough the fact that there is normally no intention (nor normally any possibility of achievement) for the model to be an accurate and complete representation of the real world. In addition, with such a wide definition, it is essential, as BAS has identified, that the Standard should be applied in a proportionate way.

It should also be noted that the definition of a model includes the “data”, “assumptions”, “methodology”, “systems” and “outputs”. Several of these are likely to be covered by other TAS standards and it is important that the Modelling TAS has explicit boundaries, such as covering methodology, systems and their accompanying documentation.

3. Do respondents have any comments on the proposals in section 3, especially those in paragraphs 3.15, 3.22 and 3.27?

On paragraph 3.15, we have a number of comments:

- The standard that the principle aspires to is laudable, but needs to recognise where model development and documentation standards currently are and the practical cost of implementing such a standard. In our view the purpose of documentation should be to provide an understanding of what has been done, how the model fits together and how it should be operated to produce the required output.
- It is not clear what is meant by the standard of a “technically competent person with no previous involvement”. In our view there are some minimum standards that would be expected for someone to fit the description and to be able to understand the model. There are a number of competing software products on the market for the same purpose as well as the possibility of models being built using bespoke software. Therefore the standards would include, for example, the expectation that the person:
 - would be technically competent in the software and modelling techniques being used, not just technically competent in modelling or in a similar software package.
 - has sufficient knowledge of the company and other relevant matters to be able to gain an understanding of the appropriateness of the model
 - should have access to the original model, as a lot of the more detailed descriptions are now generally embedded within the model and do not make sense when taken out of context.

- The proposed principle refers to the assessment of “the judgements that have been made”. We recommend that there is clarity around what would be considered a “judgement” in the context of modelling. Clearly it includes the recommendations that have been made based on the model outputs, but does it include the appropriateness of the assumptions both in the design of, and inputs for, the model, for example.
- Many models in use in the UK are based on 3rd party software that was purchased some time ago – in some cases as much as 20 years or more. The standards of documentation of these legacy systems is generally not as good as the standards expected today. Models are often not well documented for either the base software provided by the 3rd party or the modifications made by the developer to make it suitable for the uses to which the model is being put. This is also complicated by the fact that models have evolved over time, for example models originally designed for deterministic liability calculations have typically been enhanced to include asset calculations, stochastic valuations and, more recently, projections of full balance sheets. This expansion of use might be accompanied by good documentation of the changes made but is not always been accompanied by the appropriate documentation to deal with the legacy documentation issues remaining. This would present a challenge to the achievement of the proposed principle.
- There are a number of accepted standard treatments in the development and use of models (particularly for different software packages) and, in order to manage the amount of documentation that would be necessary, it should be acceptable to state where standard treatments have been used rather than providing full documentation. However, where there are departures from such approaches, there is a greater need to both indicate that a non standard approach has been used and to document both the approach and the rationale behind that approach.
- There is also confusion in section 3.14 between actuarial information and documentation. How, for example, would specification working papers be treated in this context.

On paragraph 3.22, we would re-emphasise the relevance of materiality in determining proportionality.

We are concerned that paragraph 3.27 is not detailed enough.

- It is not clear from the principle who is making the judgements and the extent to which they are suitably qualified and empowered to make those judgements. The owner of the judgement should be identified and they should be clear on the basis on which they are making those judgements. For example, are they making judgements affecting the use of that model or how it is structured to achieve its objectives.
- Where a judgement has been made by a user of the model output, rather than the modeller, it needs to be made clear where the modeller is not in agreement with the judgement being made and on what basis there is disagreement.
- The principle is also vague in defining the circumstances in which judgements should be reconsidered. In our view, it would be helpful to recommend that judgements are reviewed at least annually where a model is used regularly and to provide examples of other circumstances when it would be appropriate to reconsider judgements, for example in “post balance sheet events”.

We also note that, in paragraph 3.28, there is a circular argument in that it is difficult to determine the materiality of a difference without first carrying out some form of assessment of the value of that materiality.

4. Do respondents have any views on the definition of materiality that is proposed in paragraph 3.5?

Whilst it is difficult to be prescriptive about defining a material departure, our view is that the extension provides insufficient clarity and is difficult to comprehend. Additional guidance (such as that provided to auditors when assessing materiality in the context of an audit) is required. It would be helpful to have the second sentence about documentation as a separate bullet point within the principles.

In determining any material departure from the Modelling TAS, consideration should also be made of any deviations from modelling best practice that could have an impact on future uses or developments of the model. For example, practices such as hard coding, rather than parameterising, variables should be actively discouraged within the TAS.

5. Should the modelling TAS include principles concerning the need for documentation as discussed in paragraphs 3.9 to 3.18?

Yes – see answer to Q3 above

6. Do respondents have any comments on the proposals concerning relevance and parsimony that are presented in section 4, especially those in paragraphs 4.12 and 4.17?

The principle proposed in paragraph 4.12 should explicitly refer to the need for recipients of the work product to understand that the model can only take into account, or explicitly ignore, those items that the developer knows about (the “known knowns” and the “known unknowns”). It cannot take into account the “unknown unknowns” and this principle should therefore not be used to carry out a review of the materiality with the benefit of hindsight.

We are not convinced that the principle in paragraph 4.17 should be part of a Modelling Standard, as opposed to best practice or guidance. There are a number of reasons why increasing complexity is introduced into a model, without materially changing the actual outputs. For example, insurers originally published deterministic embedded values, but have recently published on the CFO Forum’s Embedded Value bases. The actual outputs may not have changed materially in value, but they would argue that the quality of the outputs and confidence this gives to external advisers justifies the additional modelling complexity. We therefore recommend that paragraph 4.17 is enhanced by adding the words “quality of, and confidence in, the” prior to the word “output”. The principle would then read:

Increasing degrees of complexity should be introduced into models if and only if they make a material difference to the quality of, and confidence in, the outputs or materially reduce the limitations of the model in question”

The Modelling Standard should also guard against using models that focus only on the things that can be modelled and not things that can't (at least not easily). For example, some would argue that certain existing models for longevity improvements are used "because they are there", with little regard for a large number of other materially relevant factors that could have a bearing on the model outputs.

7. Do respondents have any comments on the proposals concerning inputs and outputs that are presented in section 5, especially those in paragraphs 5.17, 5.28, 5.29, 5.35, 5.42 and 5.51?

We have no comments on paragraphs 5.17 and 5.28. It should be noted that, in our experience, the documentation proposed in the principle in paragraph 5.28 is not always carried out currently.

Our review of paragraph 5.29 highlighted 2 different interpretations of the principle, particularly concerning the wording “it is not possible to demonstrate that the grouping has no material effect”, where there is a double negative, and it was not clear which interpretation was intended. We have assumed that the wording is intended to mean that it may not be practical or possible to produce results using seriatim data to demonstrate no material impact, rather than an interpretation that the grouping has a material effect, but is still a valid and useful grouping.

In paragraph 5.35, we propose adding the words “and appropriate” after consistent. As written, the principle could imply consistent assumptions that are not appropriate for the use in question. The principle would then read:

The assumptions used in a model, or in a suite of models that operate in conjunction, should be consistent and appropriate, taking into account the purpose of the model or models in question.

The principle proposed in paragraph 5.42 does not cover the point made in paragraph 5.38. For example in situations where insufficient data is available in tails of distributions, there is a tendency to underestimate the expected assumption and therefore output. A statistical definition will not overcome this tendency to underplay the worst situation and so an assumption defined as a “1 in 200 year event” may, in reality, be something less extreme. In our opinion, for guidance to be effective, it needs to be more explicit. This principle would benefit from an expansion of the last sentence to indicate how the provider of the information has made themselves comfortable that the estimate can be justified as representing what it claims to represent. It needs to be recognised that, in a lot of tail distributions, it is difficult to demonstrate that an assumption is statistically validated.

Whilst we agree with the objective behind the principle in paragraph 5.51, this will require a change in culture and attitude for both providers and users of actuarial information. Best estimates in actuarial modelling are generally assumed to have some level of prudence within them, for example the “best estimate” mortality assumptions for assurance business generally do not allow for future mortality improvements, whereas those for annuity business will make an allowance.

8. Should the modelling TAS include:

a) any requirements relating to the disclosure of known or suspected shortcomings in data, over and above those expected to be included in the reporting TAS?

The output of any model realisation will be impacted by at least 3 different sources of Technical Actuarial Standards (TAS), the Generic Data, Modelling and Reporting Standards, plus any specific TAS relating to a particular area of work. This is likely to make it difficult to understand which elements of each TAS applies in specific situations unless there is a clear demarcation where the scope of one TAS stops and the next TAS starts.

Intuitively it would be sensible to keep all disclosure requirements in a single place. This leads to the view that no disclosure requirements should be in the Modelling TAS.

b) requirements to provide an estimate of the effects of any data shortcomings, and that any compensating adjustments should avoid bias?

We feel it is important to provide some statement as to the existence of any known shortcomings and to give an (unquantified) view of the potential impact. As an example, a pension scheme may only have good data on 70% of its membership and has to make assumptions about the other 30%. It would not be possible to give a quantification of the impact, although it would be reasonable to expect some commentary on the shortcomings and how they might affect the confidence in the outputs.

9. Should the modelling TAS include a requirement that, if data is grouped, the effects of the grouping should be quantified?

There are a number of circumstances in which data can be grouped. There may only be grouped data in existence, for example in some reinsurance companies, they only receive grouped data from their clients. In these situations, because the underlying data is not available, it would not be possible to provide any quantification.

In Life models, projection periods are typically to the end of the life of the policy, which can be many years hence. Adding to this the need to run stochastic models to evaluate the impact of different investment scenarios normally means that running seriatim data is not practical in an acceptable timescale. It would, however, be reasonable to assume that such organisations can run both seriatim and grouped data sets at a less pressured time to evaluate the effect and to use it to justify that the grouping is appropriate.

In some GI lines of business, particularly in the London Market, there can be as big a difference within classes of business as there are between classes of business. Here it may be appropriate to use grouped data to produce stable output.

Our view is therefore that there should be no requirement, but that it should be encouraged where it is appropriate.

10. Do respondents agree that best estimates (and other similar estimates) should be independent of the use to which they will be put?

We agree that the term “best estimate” can be interpreted in many different ways and has historically been used in circumstances in which it would be more appropriate to describe an estimate as prudent. For example, a company may define its “best estimate” for the value of reserves as the 65th percentile rather than the mean.

One option would be to require a definition of what is meant by “best estimate” to be included in the documentation supporting any model realisation.

11. Do respondents have any views on:

a) whether biased estimates such as those concerning prudence depend on context?

In our view the use of biased estimates depends on the context within which they are intended.

b) the practicality or otherwise of requiring that the equivalent best estimate be presented alongside every prudent estimate, and the benefits to users of actuarial information of doing so?

It is desirable to provide a best estimate and a range of outputs, which would include a prudent estimate, to enable the receiver of the information to understand the sensitivities of the underlying assumptions. However, this may not always be practical, particularly in extreme scenarios where it is not clear what is best and what is prudent (e.g. when is a 1 in 200 event best estimate or prudent). In addition the benefits may not be properly understood by the users of the actuarial information, for example, they may see 2 sets of outputs as a range. It is therefore incumbent on the provider of the information to ensure that the interpretation of each set of information is clear and that the user of the information understands the uses to which the various sets of data can reasonably be put.

It should also be noted that there are certain legal requirements to use prudent estimates. For example, in advising Pension Scheme Trustees about scheme funding under the Pensions Act 2004, the final results will be a prudent liability. It makes sense for best estimate results to be discussed earlier in the advice process - so that the Trustees have an understanding of the final level of prudence involved (and this normally happens already). However, there seems little merit in always having to include best estimate results in the final results.

12. Do respondents have any views on the practicality or otherwise of requiring the use of a range in conjunction with every single point estimate?

The key words in our view are the requirement with every single point estimate. We do not think this is practical and in many situations may not make sense. We would prefer the TAS to encourage the use of ranges where this makes sense. For example, it may be appropriate to provide this information to someone who is reviewing the work carried out, but not necessarily for onward distribution. However if the impact is material, it is incumbent on the providers to give sufficient information to enable users of the information to understand the range and its relevance.

13. Do respondents have any comments on the proposals concerning the fitness for purpose of models that are presented in section 6, especially those in paragraphs 6.8, 6.12, 6.20, 6.28 and 6.33?

The focus behind the principle in paragraph 6.8 is to ensure that there are appropriate levels of control in place. For example where an input value is changed, it should not be necessary to check the outputs in great detail if there is sufficient confidence in the robustness of the model. Therefore the level of checks that are necessary for a particular realisation will depend on the level of control that is built into the model and the processes surrounding it. Where a model is being put to a new use, e.g. an embedded value model being used for a capital stress scenario, thought needs to be given to how the existing controls need to be enhanced to validate the new use. Our view is that this principle would benefit from a reference to controls (which are proactive) as opposed to checks (which are normally seen as reactive).

We are happy with the wording for the principle in paragraph 6.12, although we note that it may not be achievable where there has been a change in the model version since the original implementation or since the specific realisation was run. Whilst it would be reasonable to expect some previous versions to be held, it is not practical to maintain copies of old model platforms ad infinitum.

It is reasonable that the principle in paragraph 6.20 requires the documentation of the appropriateness of the theoretical construct of a model and that the reader can be assumed to have some minimum level of knowledge of the model objectives and modelling platform. The documentation supporting the theoretical construct should not be written with an unknowledgeable audience in mind. However, it is also appropriate to expect that the documentation given to users of actuarial information will include a summarised and simplified description of why the model design meets the purpose for which it has been designed. It is also necessary to ensure documented procedures are in place for others to be able to set up, run and produce output.

This therefore suggests that there are 4 levels of documentation required:

- a technical version for the knowledgeable reader, covering aspects such as design and build of the model
- user and maintenance guides for people who did not develop the model, but need to parameterise and run the model
- a non technical version for the lay reader, to provide an explanation of what purposes the model is designed for and how it meets those purposes.
- justification for the assumptions used to provide actuarial information from the model

We believe that the principle in paragraph 6.28 should be extended to include a requirement to document the data source, how the data is extracted, the date of extract and the controls in place. This may sit more naturally within the Data TAS, rather than the Modelling TAS.

We have no comments on the principle in paragraph 6.33.

14. Are there any types of model that cannot be implemented in such a way that they exhibit reproducibility?

Some bespoke developments may not be able to control random seeds and therefore not be reproducible. We are not aware of this issue for proprietary software.

There may also be problems in allowing reproducibility across versions of models, as the random seed process may have changed. We would expect the effect to be immaterial and for any material differences to trigger further investigation.

15. Should the modelling TAS include a principle concerning back testing?

Whilst we agree that the concept of back testing may be desirable in a number of cases, we do not think it should be made a requirement.

a) Are there any models for which back testing is impossible?

There may be a number of situations where back testing is difficult if not impossible. For example on models covering new and innovative products or where the data may not actually be available in the format that the model would need.

b) Are there any practical difficulties that might arise if back testing were to be a requirement?

Back testing is really a way of validating that events that did happen would be predictable within a model, for example within a catastrophe model we can look back over, say, 30 years experience and identify if the frequency and magnitude of events that did happen were within the range of modelled outcomes. But there will also be events that the model would predict should happen over that timescale that will not have been observed due to random fluctuations. That does not invalidate the model in itself.

There are some situations where back testing would not be appropriate:

- if the data or the use for which the model is designed has only been in existence for a short time, there may not be sufficient information available for back testing to be effective;
- where the model is designed to mimic a future environment that it is known will be different in some respects from those in the past, for example, due to legislative changes.

16. Would it be desirable and practical for users of external models to document the judgements they make, the checks that they perform and other relevant matters, and include explanations of the inputs, outputs and limitations in the same way as they would for models that they themselves have developed? Respondents who believe that this would not be practical should suggest alternative ways in which the objective set out in paragraph 2.9 could be met by users of external models.

Whilst it would be desirable for users of external models to treat them as if they were developed by the user themselves, one needs to consider the reasons why an external model is used.

Generally these are for one of two reasons:

- The model requires some level of expert knowledge that the user of the model does not have, for example catastrophe models
- The use of external proprietary software speeds up the development process and allows the cost of generic developments to be shared across all of the licensees. This would typically include life and non life actuarial modelling software packages.

The provider of the external model should provide appropriate documentation to the modeller in terms of model structure, functional considerations and judgements that the modeller can reasonably make. They should then be able to document the checks they have undertaken, the judgements made subject to that prior documentation and, in theory, the information provided should contain the same level of detail as an internal model.

However, in neither case is the modeller likely to have sufficient knowledge, or time, to delve into the heart of the software and understand exactly how it is functioning, or how the data is used. In some cases, there will be licensing restrictions that adversely impact a user's ability to undertake the level of checks that they would be able to make in a bespoke model they have created themselves.

Modellers, and users of the information, therefore need to gain comfort in the external model in the same way as a reviewer of a bespoke model would do so, by understanding and challenging the information provided.

17. Do respondents agree that requirements for robustness and reasonableness would not be enforceable and could have undesirable consequences?

We do not think that the requirements for robustness and reasonableness will be enforceable and could have undesirable consequences.

For example in paragraph 6.50 of the consultation paper, reference is made to a 1 in 200 year extreme scenario event and whether the fact that in 1974 the UK equity market fell by 55% invalidates an assumption of 40% for a 1 in 200 year event today. Given the press speculation and adverse market conditions over the last year, one would assume that the equity markets are in a more adverse position today than in 1974. However the FTSE has only fallen by 38% from its high over the last year¹.

In considering reasonableness of assumptions, one needs to take into account structural changes that could impact the validity of the past in estimating the future. For example, the overall level of interest rates in Poland has decreased since the country joined the EU.

We also support the comments in relation to robustness and note the examples in the BAS' own consultation document.

18. Do respondents have any comments on the proposals concerning the limitations of models that are presented in section 7, especially those in paragraphs 7.29 and 7.41?

We support the first sentence of the principle in paragraph 7.29. However we have some concerns with the second sentence as it could imply that one needs to identify all the assumptions that have been made and document why they are immaterial or otherwise inappropriate. There needs to be recognition within the principle that there is a difference between assumptions that are effectively structural, such as which asset model is used to build the model, and the level of parameterisation that is appropriate for the specific realisation. In the former situation, it would be reasonable to expect that tests on key decision options will have been undertaken and documented as part of the specification. It would, on the other hand, be preferable to detail why the sensitivity tests chosen are felt to be appropriate where the assumptions relate to parameterisation.

We are also concerned by the principle set out in paragraph 7.41. Whilst we believe that any output from a model should include a description of the purpose, or purposes, for which it is suitable, this is different to explaining why the model addresses the needs of the user. For example, the model may not provide the user with what they actually want. We would therefore suggest that this principle is refined to ensure that the information includes an explanation of the purpose for which it is suitable. We agree with the requirement that it should include the material limitations and their implications, although this could be qualitative rather than quantitative.

19. Does the discussion in paragraphs 7.7 to 7.24 include all the major sources of limitations in models?

The only areas we would add to the discussion are:

- There is a risk that the question asked by the user of actuarial information may not be properly understood by the provider of the model or model output, with the result that the information provided does not answer the question that the user wanted. This risk is exacerbated if the user relies on the actuary's knowledge and assumes that the information provided is suitable. There is therefore not only a risk of a communication gap, but also that the information provided is not suitable for the purpose.

¹ FTSE at 19 February 2009 was 3944.41. The high was in May 2008 at 6376.5

- Where external models are used, the actuary may not be aware of exactly how the model works and finds that changing parameters, or coding, does not have the impact that was expected. This could be partially solved by ensuring improved quality of user manuals provided by the developers (internal or external) of the model.

20. Do respondents have any comments on the advantages and disadvantages of the options set out in paragraphs 7.38 to 7.42?

We support the BAS view that the 3rd option, as set out in paragraph 7.41, although as stated in our response to Q18, we would propose some modification of the wording.

21. Should the modelling TAS identify specific types of limitation that should be explained in actuarial information?

We do not believe the Modelling TAS should be explicit in specifying types of limitation. There is a risk that these limitations are seen as more important or a complete set from which a subset should be picked. We would also have concerns that resulting statements of limitations might be too generic and so of negligible value. Limitations in models are specific to the model and the purpose and we would expect the documentation to be prepared to ensure that all relevant material limitations are covered.

22. Are there any matters not covered in this consultation paper that should be addressed in the BAS's modelling TAS?

There are a number of additional points that we suggest should be considered:

- An actuary who is responsible for developing or otherwise modifying a model should have a minimum level of demonstrable competence in generic modelling skills and in the use of the particular software. Across our profession there are vastly differing levels of knowledge, skill and experience and, whilst the actuarial exam CA2 covers good model documentation and controls, it does not cover modelling techniques.
- The consultation paper does not explicitly cover the question of general communication, which is often a source of misunderstanding of what the User's requirements are and of what the model implementation or specific realisation has actually provided. As an example, whilst users of actuarial information may ask for a model to project a 1 in 200 year event, they do not necessarily believe that such an event will actually happen. In these circumstances actuarial information can be seen as not providing value to the problem at hand.
- We feel that there is increased risk when actuaries respond to an isolated question from a user of actuarial information. The provider of the response should ensure that they also consider the context within which the question has been asked. This will ensure that the user of the response is provided with information that is relevant to decisions being considered, rather than a very specific answer to the literal question posed. This would better enable the user to have a clear understanding of the information provided and whether it meets the original purpose for which it was requested. The provider should also consider how to present the information so that it is clear and that uncertainty is highlighted. This may be more appropriately covered in the Reporting TAS.