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Ms L Pryor
The Director, Board for Actuarial Standards
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Dear Louise

**Modelling: Consultation Paper – November 2008
Lane Clark & Peacock LLP response**

We are pleased to submit our response to the above consultation document.

By way of background, Lane Clark & Peacock (“LCP”) is a leading firm of actuaries and consultants, with 87 partners and principals, and a team of more than 450 employees across Europe. The firm provides actuarial, employee benefit, investment, insurance and risk management related advice as well as pensions administration services.

In general we support the proposed principles. In particular, we were pleased to see that it is acknowledged that all models are wrong, but some are useful. The reservations we have over the implementation of the principles are covered in our response to the questions in section 8 of the consultation document. These are contained in the Appendix to this letter.

Yours sincerely

{Sent as an attachment to an e-mail on 24th February 2009 at 08:25}

Chris Green FIA
Partner

Enc: Appendix

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Modelling: Consultation Paper – November 2008
Lane Clark & Peacock LLP response to specific questions

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 have concerns about part (a) of the proposed purpose of the modelling TAS. We have discussed this further in our response to question 6.

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

We feel that this definition is reasonable. However, in certain circumstances, where no data is available, a model may still be built and run only using estimated parameters. Similarly, a model may be based only on data. If this definition is read literally then a model must contain both data and estimated parameters. This point must be made clear.

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

No.

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

We believe that the definition is reasonable.

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

Yes.

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?**

We have concerns about the proposed principle in **paragraph 4.12**. Paragraph 2.5 states that “in a perfect world the models that generate the outputs would reflect those aspects of the real world that affect the decisions that are to be made.” It goes on to say that “the phenomena that are modelled should be relevant to the decision and, in addition, no highly relevant phenomena should be omitted.”

However, while it is certainly appropriate for the phenomena that are modelled to be relevant to the decision, we feel that there are often circumstances where a model may omit a material factor and still be of use in a decision making process. A material factor may

justifiably be omitted from a model due to a lack of data to parameterise it or because of difficulty in modelling it.

Usually a model should only form part of a decision making process. Depending on the circumstances, a model may take a more or less prominent role in the decision but relying solely on the output from models is not appropriate. Given that a model should only be part of a decision making process, one which only partially captures the real world can still be of use.

For example, an insurance company may be considering writing a new line of business. A model could be valuable to explore factors such as the benefits of diversification and the impact on capital requirements. However, there are many other factors that must be considered in the decision making process. These would include the ability to recruit an underwriting and claims team, the adequacy of data systems, the strength of the brand name in the new area and the ability to gain market share.

In this case, the model is a valuable input into the decision making process, even though it does not include all materially relevant phenomena.

If it is appropriate to do so, then we do believe that all relevant phenomena should be included within a model. However, it is important to recognise that partial models, which perhaps intentionally exclude a material factor, can still be of use when making decisions. If a model excludes any relevant factors then the limitations of the model should be well communicated to the end user. The communication of limitations is covered by the modelling TAS elsewhere.

The proposed principle set out in **paragraph 4.17** is a sound one in most cases but we feel that it is important that such a principle does not limit flexibility of a model. It may be desirable for commercial reasons to build a model which captures several elements of the real world, which can then be used for more than one purpose. Care must be taken if a model is used for more than one purpose that it is fit for all purposes. However, if a certain degree of complexity in the model is not necessary for a particular purpose, it should not necessarily limit the use of the model in that circumstance.

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?

The proposal in **paragraph 5.17** seems a sensible requirement on the whole. However, the wording should be improved so that it recognises that even where data is complete, accurate and relevant it may still be necessary to apply judgement and not rely wholly on the data. Adjustments made to parameters or outputs in these circumstances should be documented together with the reasons for adopting them.

We believe that the way in which **paragraph 5.28** is worded does not apply well to all disciplines. A requirement to document the approach taken to grouping the data and the reasons for choosing this grouping is a valid and sensible requirement. However, we believe the requirement to document the effect of using grouped data rather than the ungrouped data from which it is derived will not add value or provide any meaningful insight in some circumstances.

For example, in the field of general insurance, many standard actuarial techniques for reserving are based on the analysis of aggregated information in the form of triangles. To document the reasoning behind not analysing the ungrouped policy by policy or claim by claim data does not seem to add any value.

Similarly to the proposed principle in paragraph 5.28, **paragraph 5.29** does not apply well to all disciplines. Taking again the example of general insurance reserving, it is often the case that data received by the member is already in an aggregated form. It would, therefore, not be possible to demonstrate that there is no material effect of the chosen grouping. However, the member may still be satisfied through discussions with those preparing the data that the grouping is appropriate and provides the closest possible outcome to homogenous groups that are still large enough to perform meaningful analysis on.

If members were required in such circumstances to explain the possible effects of the grouping and that a different grouping could give different outputs, this could confuse the user of the actuarial information and undermine the results of the work being done.

We believe that the principle proposed in **paragraph 5.35** is a sensible one.

We believe that the principle proposed in **paragraph 5.42** will, in many circumstances, help to make the information being used in models and the outputs from models to be better understood both by the users of the information and also other actuaries performing professional reviews. In particular, the application of this principle to the phrase “best estimate” should help to clarify what the output of a model is intended to represent.

However, there are circumstances where this may not apply so well. In the case of option pricing, the price is often referred to as the fair value. However, the true statistical definition may be closer to “the expected value under the risk neutral measure as opposed to the real world measure”. If the user of the results does not have a statistical background then this would not aid understanding of the actuarial information. Therefore, it may not be appropriate to apply this principle to all model outputs.

The proposed principle in **paragraph 5.51** says “Outputs or assumptions that are described as best, central or reasonable estimated, or other similar terms, should be derived using methods, assumptions and judgements that are independent of the purpose of the model.”

Our understanding of this proposed principle is that the member should not let any best estimate that they produce be influenced upwards or downwards by the purpose of the model. In other words the best estimate should not be biased by the purpose of the model. For example, if the member were asked to calculate their best estimate of a company’s liabilities for the purposes of solvency or for the purposes of a sale that the best estimate, if it has been given the same statistical definition, should be the same in both cases. We feel that this is a laudable principle to include in the modelling TAS and we support it.

However, we believe that the way that the principle has been worded does not adequately convey this meaning and that it directly contradicts the proposed principle set out in paragraph 3.27.

The principle in paragraph 3.27 states that “Judgement about matters concerning models should be exercised in a reasoned and justifiable manner, taking into account the purpose of the model or models in question.” However, the principle set out in paragraph 5.51 suggests that, where best estimates are concerned, they “should be derived using methods,

assumptions and judgements that are independent of the purpose of the model". It is not possible to satisfy both these principles.

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?**

We have no comment on this.

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

We agree with the BAS that such a requirement would be too difficult in practice and that this should not be made a requirement within the modelling TAS.

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

We agree with the BAS that this would be an unduly onerous requirement and in some cases that it would be impossible. Therefore, we do not think it would be appropriate for the modelling TAS to include such a requirement.

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

As discussed above in our answer to question 7, we agree with this idea in principle. However, we do not feel that that the way it is expressed in paragraph 5.51 is appropriate.

11. Do respondents have any views on:

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

We believe that biased estimates such as those concerning prudence do depend on context.

- 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?**

We do not feel that this is a practical idea. Input assumptions are sometimes determined on a prudent basis owing to lack of information and when a true best estimate simply cannot be determined. If the member felt that they could estimate the true value of the parameter in question then there may be no need to be prudent in the first place. It follows that in some cases it is not possible to strip out the prudence in the resulting estimate.

12. Do respondents have any view on the practicality or otherwise of the requiring the use of ranges in conjunction with every single point estimate

We believe that ranges are valuable in communicating uncertainty to the users of actuarial information and they should be used where ever appropriate. However, to require the use of a range in conjunction with every single point estimate is an onerous and inappropriate requirement.

It is sometimes the case that the person commissioning actuarial information is specific in their request for only a point estimate. For the profession to be governed by guidance which means that the commissioner's instructions must be disregarded does not put us in a position where we can best serve the role requested of us.

In other circumstances a range is simply inappropriate whether requested or not. For example, where a transfer value has been requested for an individual transferring their pension from one scheme to another, a range around the point estimate would not help to aid understanding. A fixed amount of money must be transferred from one scheme to the other and for this to happen a single estimate is required. Providing a range will add nothing.

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?

Subject to the comments below about reproducibility, we agree with the principle in paragraph 6.12.

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

We believe that all models can be implemented in such a way that they exhibit reproducibility where reproducibility is defined as it is in the first sentence of paragraph 6.10.

However, one factor to consider here may be that the way a model has been constructed may mean that the users are beholden to software manufacturers. For example, if the random number generator in Microsoft Excel has been used and Microsoft issues a new version of the software, the random number sequence may change making reproducibility impossible.

We would also like to add that we do not believe that having a model that is reproducible necessarily means that it is easier to determine how the output changes, if at all, with any change in the input.

Consider the example of a stochastic model where the seed is controlled by the user of the model. If an input is changed and the model is rerun with the same seed, then there may be a difference in the output. However, if the model is run on a different seed before and after the change in the input, the change in the output will not necessarily be the same in both cases. Hence, reproducibility is not the important factor when considering how the output of a model changes with a change in the input.

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

We do not believe that the modelling TAS ought to include a principle concerning back testing, at least not as a mandatory requirement. Back testing can have value but it is fraught with difficulties.

One important issue concerning back testing is how to interpret the results. It does not necessarily follow that a model which has been back tested and shown to match well against historical data has good predictive powers.

For back testing to be done properly, there must also be sufficient data to back test against. This is often not the case, for example modelling new asset classes. Furthermore, the data that a model is back tested against ought to be independent of the data that is used to parameterise the model to avoid a self fulfilling situation.

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

Yes. We believe that there are many models for which back testing is impossible, for example as mentioned above new asset classes. This is mostly owing to the lack of independent historical data in order to back test the model against.

There are also other circumstances where a model cannot be back tested. For example, in the general insurance field, a model that is intended to produce the 99.5th percentile of the outcome of the liabilities cannot be back tested since the 99.5th percentile of the distribution of the potential liabilities can never be known.

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

Since we believe that not all models can be back tested, we feel that in practice such a requirement could not be applied universally.

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.

We believe that it would 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.

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

Yes.

- 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?**

No.

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

We think that it does.

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

We agree with the BAS's thinking on this and feel that the approach taken of requiring the actuarial information to include both the needs addressed as well as the limitation is a suitably balanced approach to this issue.

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

No.