



Institute  
and Faculty  
of Actuaries

# Actuarial Software and Calculations – Professional Responsibilities

A note for pension scheme trustees and sponsors



January 2015

# Contents

1. Précis	1
2. What to expect of your actuary	3
3. Application of the principles within the Actuaries' Code	5
4. Any comments?	7
Appendix 1 - illustrative scenarios	8
Appendix 2 - practical help	11
Appendix 3 - factors to consider	14

## 1. Précis

The Institute and Faculty of Actuaries (IFoA) has issued this Note, “Actuarial Software and Calculations-Professional Responsibilities” (ASCPR), for the benefit of trustees and pension scheme sponsors.

The IFoA has issued the précis to this Note as a separate publication, and has also produced a Question and Answer document for actuaries. These three documents on professional responsibilities for actuarial software and calculations

are collectively referred to as the ASCPR guidance.<sup>1</sup> The ASCPR guidance is produced in response to the growth in the use of third party software and the reliance on support teams for producing actuarial calculations.

<sup>1</sup> The ASCPR guidance does not constitute legal advice, nor does it necessarily provide an actuary with a defence to allegations of misconduct. While the IFoA has taken care to ensure this is accurate, it will not accept any legal liability in relation to its contents.

The ASCPR guidance explains the professional responsibility of actuaries<sup>2</sup> when they provide advice or actuarial information which relies on data or calculations provided by:

- trustees or scheme sponsors;
- computer models or software programs;
- a third party to whom the work is outsourced or
- internal support teams.

## **Professional judgement**

Actuaries must:

- follow the Actuaries' Code. They must comply with the principles within the Code when providing their professional services.
- take professional responsibility for their advice and recommendations.
- use their professional judgement when using or relying on third party information, whether from a computer model or another actuary. The amount of checking required is a matter for their judgement exercised in the context of the purpose and scope of their advice.

## **Contractual responsibility**

It is not for the IFoA to regulate the agreement you reach with your actuary in relation to commercial and legal responsibility for the advice and calculations.

## **Scheme Actuary**

There are special considerations for Scheme Actuaries. They must assume a level of professional responsibility commensurate with that role.

## **Scenarios to illustrate guidance**

This Note provides, in Section 3, examples of how the principles within the Actuaries' Code may have an impact on actuaries when they are relying on third party and computer models and support team calculations. It is illustrated with five scenarios in Appendix 1. Appendix 2 includes questions and answers in relation to the application of this guidance. Appendix 3 contains a list of factors for trustees to take into account when considering the approach to be taken for your scheme.

---

<sup>2</sup> Within the ASCPR guidance, the term "actuary" is used to refer to an actuary who is a member of the IFoA.

# 2. What to expect of your actuary

Your actuary will wish to support the role played by trustees in ensuring public confidence in pension schemes. Actuaries are held by the IFoA to high standards of professional conduct.

**Actuaries must observe the five principles set out in the Actuaries' Code:**

## **Integrity**

Actuaries “will act honestly and with the highest standards of integrity.”

## **Competence and care**

Actuaries are required to “take care that the advice and services they deliver are appropriate to the instructions and needs of the client, including the legal and other rules which govern the matter, having due regard to others .....whose interests are affected by the work of the member”. They will also “agree with the client the scope and nature of any appointment or instruction”.

## **Impartiality**

Actuaries “will not allow bias or conflict of interest ..... to override their professional judgement”. Actuaries “will ensure that their ability to provide objective advice to their clients is not, and cannot be reasonably seen to be, compromised”.

## **Compliance**

Actuaries “will comply with all relevant legal, regulatory and professional requirements [and] take reasonable steps to ensure they are not placed in a position where they are unable to comply....”

## **Communication**

Actuaries “will, in communicating their findings, show clearly that they take responsibility for them.”

The Actuaries' Code, along with other professional standards and information on the regulation of actuaries, may be found at [www.actuaries.org.uk/regulation/pages/regulation](http://www.actuaries.org.uk/regulation/pages/regulation)

Actuaries have a professional responsibility to speak up if they believe that a course of action is unlawful, unethical or improper and, where legal protections exist, report such behaviour to regulators or other relevant authorities.

Any actuary who is influenced to use inappropriate data, assumptions and models could be subject to disciplinary proceedings.



# 3. Application of the principles within the Actuaries' Code

## A clear brief

It is essential that you and your actuary fully understand the reason for requesting the advice and calculations to ensure that they are fit for purpose.

## Professional judgement

Modelling the financial characteristics of a pension scheme is by its nature complex. Amongst the core skills of an actuary are abilities to analyse the data and define and select assumptions and models for the calculation of actuarial information relevant to any advice, whilst ensuring that they are fit for a particular purpose.

It is likely that more than one model could be appropriate for a client's particular purpose. Two different actuaries may have differing views of what is appropriate, as might two different trustees of similar schemes. You can expect your actuary to discuss these issues with you. The choice of model is a matter for the individual actuary, and it will depend on the circumstances of the advice, the methods used by the individual actuary and the level of reliance.

The actuary will need to take into account the purpose of the project, instructions by the client and role performed by the actuary.

## Professional care

The level of checking required by an actuary will depend on the circumstances. For example, actuaries certifying figures in their capacity as Scheme Actuaries will carry out more extensive checks than actuaries who are asked to calculate approximate figures for illustration only. Your actuary must make clear to you the extent to which you can rely on the information provided.

You can expect actuaries to carry out due diligence each time they are asked to certify or take professional responsibility for a figure. They must check assumptions, models and relevant data sources to ensure they are fit for purpose and up to date. This is the case even if the software, third party or support team has previously produced accurate figures.

Trustees and scheme sponsors should consider the potential risks when relying on advice that may be based on incorrect or unchecked data.

Actuaries must consider whether advice from other professionals and other specialists is necessary to assure the suitability or quality of their work. This might be particularly relevant where the actuary provides input to one component of a larger project.

### **Impartiality**

The actuary's independence must not be, or be seen to be, compromised. A risk of bias, or at least of perceived bias, may arise when a Scheme Actuary uses software configured by a scheme sponsor. In these circumstances the Scheme Actuary may decide that, to take professional responsibility for the figures, additional models should be run to check the results.

### **Legal and technical compliance**

Actuaries must comply with all applicable actuarial standards. For example, in the UK, the Financial Reporting Council publishes technical actuarial standards, which actuaries should comply with or explain their reasons for not doing so.

All parties will need to ensure that they comply with applicable data protection legislation, such as the Data Protection Act 1998.

### **Clear communication**

The actuary should agree with you where the professional responsibility lies for the data, assumptions, models and the resulting advice and therefore the level of reliance that can be placed on the advice.

The actuary must make sure the client is aware of potential conflicts and that these are managed satisfactorily.

The actuary and the scheme sponsor must discuss what arrangements, if any, need to be put in place to preserve the confidentiality of each party's information.

# 4. Any comments?

The content of this Note will be kept under review and for that reason we would be pleased to receive any comments you may wish to offer on it. Any comments may be directed to:

**Actuarial Software and Calculations –  
Professional Responsibilities**

Institute and Faculty of Actuaries  
Level 2 Exchange Crescent  
7 Conference Square  
Edinburgh  
EH3 8RA

or

[regulation@actuaries.org.uk](mailto:regulation@actuaries.org.uk)





# Appendix 1

## Illustrative scenarios

Some examples of situations which could be faced by you and your actuary are given below, together with possible approaches that might be followed in order for the actuary to assume professional responsibility in these situations.

**Note that the steps are only examples and may not be necessary or appropriate in all similar situations.**

### Scenario 1:

#### **Scheme Actuary carrying out an approximate, illustrative update for the trustee.**

Trustees have asked their Scheme Actuary to provide a very approximate indication of the latest valuation result for their scheme. The agreed scope of this project makes it clear that the main purpose is to identify the impact of recent investment changes on the results, accepting that the detailed impact of member movements is not within the scope of the project on grounds of cost. The results will be confidential to the trustees and will not be shared with any third party.

The Scheme Actuary already makes a software model available to the trustees which provides an indicative value of liabilities updated to reflect changing market conditions.

However this information is provided under a software licence rather than under professional terms of engagement and the trustees have specifically requested professional review of a particular result from this software to provide additional reassurance.

The Scheme Actuary reviews the data, assumptions and model underlying the software and concludes that it is appropriate in the light of the agreed scope and purpose. The Scheme Actuary then carries out independent checks on the calculated results and provides a report to the client, providing the information requested and the background to the findings. Given the purpose, and the agreed approximate nature of the desired result, the checks the actuary carries out are of a limited nature, commensurate with the agreed scope and budget for the project.

## Scenario 2:

### Use of third party software in certifying statutory figures.

A scheme sponsor has purchased a software product which provides periodic updates on the funding position and reported accounting position for its various pension schemes. In the light of this purchase it has asked the trustees of each scheme to require that their actuary adopts the software for triennial valuations for each scheme.

The software is licensed to the sponsor and the licencing terms make clear that the software provider has no direct commercial or professional responsibility to either the trustees or the actuary of each scheme.

The Scheme Actuary discusses this with their client and concludes that the most cost effective way to take professional responsibility for the figures certified, and to be able to continue to offer the usual commercial protections, is for the Scheme Actuary to use instead his/her own internal models to certify the relevant Technical Provisions. The key drivers for this were as follows:

- independence (and perceived independence) from the scheme sponsor;
- the relative cost of using documented internal models against the cost of auditing the models, assumptions and data inherent in the sponsor driven model;
- a desire by the client to retain commercial protections offered by the Scheme Actuary;

- the wider range of potential users of the actuarially certified figures (e.g. Scheme Actuaries, regulators, scheme sponsors); and
- the potential need for subsequent advice to require more detailed analysis and output than the software is able to provide at reasonable cost.

## Scenario 3:

### Use of third party software in certifying statutory figures.

A scheme sponsor has purchased a software product which provides periodic updates on the funding position and reported accounting position for its various pension schemes. In the light of this purchase it has asked the trustees of each scheme to require that their actuary adopts the software for triennial valuations for each scheme.

The software is licensed to the sponsor but appropriate terms have been put in place around confidentiality. The trustee, actuary and software provider have agreed suitable budgets and service agreements to allow flexibility of programming. The Scheme Actuary and their team have been given sufficient information about the model and software and have sufficient access to and control over intermediate results, assumptions, model configuration and data. They also have access to other models to provide an independent check on the results used.

On instruction from the trustees, the Scheme Actuary confirms the models and assumptions used are appropriate and

constructs and performs a set of checks on the data in order to determine the extent to which the data is sufficiently accurate, relevant and complete for users to be able to rely on the resulting actuarial information.

The Scheme Actuary then applies checks to the intermediate results to confirm professionally that the figure to be certified has been calculated in accordance with the methods and assumptions adopted and that the results are appropriate for this purpose on this occasion.

When communicating with their client in these circumstances, the Scheme Actuary will make clear that they have not carried out an audit of the software and that they are not taking responsibility for any other output from the software either on this or any other occasion.

#### **Scenario 4:** **Internal corporate actuary.**

Company ABC Limited has appointed an actuary in an internal role under which the actuary is to prepare figures to populate IAS 19 reports and take professional responsibility for the calculations. (IAS 19 is an International Accounting Standard in relation to employee benefits). The company has access to third party software models that calculate the relevant figures. However, the data and models underlying this software were put in place by a predecessor actuary. Little documentation exists as to the data and assumptions used and how assumptions are applied in the models adopted.

The actuary puts in place internal procedures to allow appropriate levels of checks on the data, models and assumptions that contribute to the calculation of the figures. Additional management procedures are introduced to ensure users of the third party software systems are aware of the risks of using the software without professional review.

#### **Scenario 5:** **Provision of projected cashflows for investment purposes.**

Trustees to a pension scheme have asked the Scheme Actuary to provide projected cashflow information in a certain format for use by the investment consultant. The scope of the project is restricted to providing interim results of the most recent valuation and it is made clear that in providing this information, the Scheme Actuary's role is restricted to providing the calculation results and does not extend to advising whether the data, models and assumptions are fit for this particular purpose.

In this circumstance, in accordance with the scope of the work involved, the trustees have limited the Scheme Actuary's professional responsibility to the provision of results only, and have assumed responsibility for the data models and assumptions used. In providing the projected cashflows, the actuary makes this clear to the trustee and, having regard to the Actuaries' Code, points out that advice from other professionals may be necessary in order that the use of these cashflows can be put into the context of the wider project.

# Appendix 2

## Practical help

In this appendix we have set out some questions and answers in order to assist with the practical application of this guidance.

**Q. What investigations might actuaries carry out if they were to take professional responsibility for actuarial work, whether carried out themselves or by others?**

**A:** The nature of the investigations would depend on the circumstances of the situation. Relevant factors would include the extent to which the actuary specified the models and assumptions used, the instructions given by the client (ie whether it should be an estimate or a refined calculation), the purpose of the work (including the importance of the decision to be made on the basis of the analysis), and the suitability of the data available. Ultimately this will be a matter for the professional judgement of the actuary taking into account all these matters and after having discussed it with you. Actuaries are subject to the Actuaries' Code and the principles within the Code may impact upon actuaries when they are relying upon third party and computer models. In particular, they are required to take reasonable steps to ensure that they are not put in a position where they are unable to comply with the Code.

**Q. I am a trustee of a pension scheme. I would like the actuary to base advice on figures derived from proprietary software. Can the actuary refuse to do this?**

**A:** If you ask the actuary to take professional responsibility for the figures supplied, or if they are required to do so as a result of acting in a reserved role, then the actuary may need to carry out further due diligence in connection with the data, models and assumptions used and whether they are fit for the particular purpose.

You should discuss with your actuary how they expect to obtain the data they need to carry out the services you require. In some cases, it may be practical to use such software but you should ensure you are clear as to where the professional responsibility lies for the calculation of any figures and the resulting advice. Depending on the purpose and the circumstances of the case, it may be possible for the actuary to work from figures you supply to them, perhaps via a software product. However, in this case, they may treat that as data and may not be prepared

to take professional responsibility for the figures supplied. It is recognised that some trustees and sponsors have arrangements in place with third party software providers which mean that the supplied figures have been provided by a team of individuals, which may include an actuary. If you have such arrangements in place, you should discuss the terms with your actuary so they can make a judgement as to the extent of the scrutiny and checking to be applied to the figures and, particularly when taking responsibility for the figures, the reasonableness of the assumptions and the controls and tests applied to the models adopted. You should consider the potential risks for trustees when relying on advice that in turn is based on incorrect or unchecked data (or actuarial information which has not been professionally reviewed).

**Q. My actuary has checked that the amount of the technical provisions calculated by proprietary software is close to the figure certified at the last valuation. Can I expect them to use the software for their future certifications of technical provisions?**

**A:** Again, discuss this with your actuary, but you can expect that the actuary would need to carry out due diligence on each and every occasion that they are asked to certify a figure. The nature and extent of the due diligence will depend on the circumstances but for example, the actuary may feel that to take professional responsibility for the figures prepared by the proprietary software, further checks

may be required on the data, models and assumptions used. In some cases, the actuary may use alternative models to check a result to mitigate model risk. They may require additional data from you in order to do this.

Calculations in relation to pension schemes can be complex and models which are fit for one purpose in conditions prevailing at one date may not always be suitable for another purpose or as at another date.

**Q. The actuary has indicated that even if we operate proprietary software, they will run dual models in order to check the results. Is this really necessary?**

**A:** This will depend on the circumstances, and in particular the purpose of the exercise and who is taking professional responsibility for any figures and follow on advice. The higher the degree of responsibility assumed, the more thorough the checking that is likely to be needed. Each individual actuary will form a view on this and two different actuaries may adopt two different approaches, both of which may be valid.

**Q. Who is responsible if the data and assumptions input to software, or the underlying model used, turn out not to be fit for my purpose or the numbers turn out to be wrong?**

**A:** This will depend on the agreements between the various parties involved and the nature of the project, particularly whether the actuary is acting in a reserved role. The actuary (and/or

the scope of your instructions) should make clear the extent to which they are assuming professional responsibility.

If the actuary is acting in a reserved role, then they must take professional responsibility for their findings. This is likely to mean that they need to carry out further checks on the data, models, calculations and assumptions and may require the ability to amend the models, assumptions and data so that the results are fit for a particular purpose.

The commercial and legal reliance offered by actuaries and their firms is not a matter for the IFoA to regulate. However client agreements can usefully highlight statutory and professional responsibilities as well as clients' additional service requirements

The reliance can be complex, and it would be a matter of good governance to ensure that you are aware of the circumstances where professional responsibility is assumed and, if so, by whom.

**Q. The sponsoring employer has configured proprietary software so that all parties can have access to common shared management information. What issues should trustees consider?**

**A:** Your actuary will normally have a professional duty to keep your information confidential. You should discuss with the actuary and the employer what arrangements, if any, need to be put in place to preserve the confidentiality of, or share, each party's information.

You should consider with your actuary whether the particular software will be able to provide the necessary analysis for the purposes for which you and the actuary intend to use it. Your actuary is also likely to want to know how it is configured so that the actuary can assess whether it is fit for purpose.

You will also need to consider who is responsible for maintaining and setting any models and who takes professional responsibility for any changes in the model, assumptions or data.

You should also consider what alternative arrangements need to be made for the provision of figures, data and analysis that are not produced by the software.

Actuaries have to comply with the Actuaries' Code, particularly in respect of conflicts of interest, impartiality and independence. This may have some impact on the extent to which you and the actuary are prepared to share software output with the employer.

**Q. Does the situation differ if, instead of using third party software, figures are produced by other actuaries/ support staff within the actuary's own organisation?**

The professional responsibilities of an actuary are the same no matter how calculations are produced. The process by which an individual actuary satisfies themselves on these matters may be different depending on how calculations are performed.

# Appendix 3

## Factors to consider

It is essential that you and your actuary agree the scope and purpose of the actuarial advice. In this appendix, we list some factors that you and your actuary may wish to consider in relation to the approach to be taken on each occasion for your scheme.

### 1. Purpose, scope and budgets.

What is the purpose of the exercise and the agreed scope of the project? In particular, what is the appropriate level of accuracy, what budget is available for this exercise and what are the short and longer term cost implications of following a particular approach? Are there choices to be made in respect of the level of simplicity, robustness and flexibility on this occasion and will these have an impact on future costs?

### 2. Statutory or reserved roles, and the range of potential users of the advice.

Actuaries must consider who their advice and/or services are being provided to (their clients). Is the actuary acting in a reserved role? If so, this might imply a wider range of possible users – for example trustees, the scheme sponsor, scheme members and the Pensions Regulator. Will the users include those not included in setting the scope and budgets? Should the purpose and scope of the advice be clear on the face of the document so

that any limitations can be understood by the wider range of possible users? Restricting the scope of the actuary's role through a commercial agreement may not be appropriate or possible in such cases.

### 3. Actual and perceived impartiality.

Will the use of a particular model, set of assumptions and data set be, and appear to be, free from bias or influence by others, particularly when using a model configured by a third party (the scheme sponsor, for example).

### 4. Conflicts of interest and confidentiality.

This might be of particular concern when a Scheme Actuary considers the use of models configured by a scheme sponsor; results may need to be kept confidential from the scheme sponsor. Also, the actuary may wish to carry out analysis beyond that which ultimately is published in order to check the results and the sensitivities to various assumptions and this may require further separation within any software used.

**5. Professional standards.**

Can the actuary satisfy professional standards, particularly those in relation to data, modelling and assumption setting?

**6. Documentation.**

Where models chosen and configured by others are considered, are they documented in sufficient detail for the actuary to be confident that they understand what they are and how the models evolve over time and as economic, demographic and legal circumstances change? Is the actuary sure that the model interacts appropriately with the actuary's own models?

**7. Model risk.**

What other models and tools are already available to the actuary to mitigate and monitor model risk? What is the potential model risk of being asked to adopt one software product for all aspects of advice? Would further models need to be configured to act as a check on the single model, what would be the cost of this and who would bear this cost?

**8. Undertakings.**

What additional undertakings would Scheme Actuaries need from the trustee in accordance with the terms of their appointment in order to carry out the work and what would be the cost of providing these? For example Scheme Actuaries may require undertakings from the trustee in relation to the

data used in any model supplied to them, and/or changes in this model or assumptions, and service level agreements.

**9. Control.**

If being asked to use a piece of preconfigured software, what freedom does the actuary have in amending the configuration or adopting the use of other models? Does the actuary and/or the actuary's team have sufficient training for how the software works, what would be the cost of receiving relevant training and who would bear this cost?

**10. Responsibility taken by others.**

Is another party taking responsibility for a part of the process? Is it clear as to who is responsible for what?

**11. Whistleblowing.**

Actuaries have a professional responsibility under the Actuaries' Code to speak up if they believe that a course of action is unlawful, unethical or improper and, where legal protections exist, report such behaviour to regulators or other relevant authorities.

**12. Management procedures.**

What management processes and controls are in place in relation to any changes to the configuration of any software, including the insertion of fresh data, and how is this communicated to the relevant parties?



**13. Commercial agreements and reliances.**

What are the commercial agreements in place between all relevant parties? What commercial and/or professional responsibility does each party – the sponsor, the trustee, the Scheme Actuary, the Scheme Actuary’s employer/firm, the software provider, the investment consultant, the investment manager etc – have to each other? Are they understood by all parties for the particular project? Would they remain appropriate for other projects? Is it clear how the use of third party software or other third party results affect the commercial liability to the client both from the individual actuary and the actuary’s firm?

**14. Functionality.**

Does a piece of software provide all results, interim results and data analytics that will, or may, be required either for this particular exercise or for potential future projects? What would be the cost and timescales to configure alternative models should the proposed software be no longer be fit for purpose? Are any potential additional costs and timescales understood by all parties?

**15. Model changes.**

If further analysis or programming is required in respect of a piece of software, perhaps because the results are not as expected and further due diligence is required before the actuary can take professional responsibility, who would bear the cost of this and can it be delivered in a satisfactory timescale? Does there need to be service level agreements between the software provider, the client and the actuary to cover these issues?

**16. Data protection.**

What is the position regarding the Data Protection Act and who takes on the role of data controller? Are data processing tasks being delegated to a party not appointed to do so by the data controller?





Institute  
and Faculty  
of Actuaries

[www.actuaries.org.uk](http://www.actuaries.org.uk)

© 2015 Institute and Faculty of Actuaries