Board for Actuarial Standards

Towards a Conceptual Framework: Consultation Paper

November 2007

THE BOARD FOR ACTUARIAL STANDARDS

TOWARDS A CONCEPTUAL FRAMEWORK: CONSULTATION PAPER

NOVEMBER 2007

FOREWORD BY THE CHAIRMAN

When the Board for Actuarial Standards (the BAS) began work on a project to develop a Conceptual Framework to underpin the standard-setting process, the Board and I recognised that it would be an interesting and challenging exercise – not only for the BAS and its staff, but also for those who took part in the project, whether as members of one of our working groups or as respondents to the consultation that we had embarked upon. And so it is proving.

This is the first time that an actuarial body has attempted to construct such a Conceptual Framework and the work is inevitably attracting interest from a wide community, from inside the profession and from elsewhere.

A considerable amount of work has been done by colleagues and by the volunteers I mentioned above. In particular, the BAS has been greatly assisted by three working groups, the Value Working Group, Risk Working Group and Stakeholder Interests Working Group. The reports of each of these groups can be found on the BAS website (www.frc.org.uk/bas).

The members of the Board and the Working Groups are listed in Appendix B to this paper and those who responded to our previous consultation paper are listed in Appendix C. The Board has also been assisted by Simon Carne, a consultant retained to advise us as we developed the project in the period leading up to the publication of this paper.

As leader of this project, I am not only grateful for their input, but I have also been fascinated by the diversity of views expressed. This diversity inevitably creates more work for those of us who have the responsibility for ensuring that opinions are listened to and taken into account as the project moves forward. But I think the Board have proved to be good listeners.

Some of the ideas in this consultation are new, in terms of both the framework and the conceptual content. The Board welcomes your views. They are important.

Paul Seymour
November 2007

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1 INTRODUCTION & SUMMARY

INTRODUCTION

1.1 In 2006, the Board for Actuarial Standards (the BAS) indicated that it was commencing work on the development of a Conceptual Framework for actuarial standards. In April 2007, the BAS published a Preliminary Consultation Paper, inviting comments on some preliminary issues and indicating that a further consultation paper would be issued in Autumn 2007, addressing a range of further issues. This document is that further consultation paper.

AUDIENCE AND AIMS OF THIS DOCUMENT

1.2 This document has been written for anyone who is likely to be affected by standards published by the BAS. The intended audience includes actuaries, the entities that actuaries advise, the regulators of, and stakeholders in, those entities and those for whom those entities provide services (typically, financial services). This last group – those for whom those entities provide (financial) services – are described in this paper as *beneficiaries*, reflecting the fact that the entities most often referred to are pension schemes and insurance companies. But this term should be interpreted widely: for example, it includes corporate customers of general insurance companies.

1.3 The responses to this consultation will inform the drafting of the Framework. An exposure draft of the full Conceptual Framework will be published in Spring 2008, so that comments can be received before the Framework is finalised and published in Summer 2008. The purpose of this paper is to gain feedback, in advance of final drafting, on a range of issues which will have an important bearing on the Conceptual Framework.

1.4 This paper is not, therefore, the Framework itself, nor a draft of it. This paper takes forward the consultation commenced in April.

RESPONSES TO THE PRELIMINARY CONSULTATION PAPER

1.5 The Board received a number of responses to the Preliminary Consultation Paper, for which it is very grateful. A list of the respondents to that paper is set out in Appendix C.

1.6 Before writing this paper, the BAS studied very carefully the responses to the Preliminary Consultation Paper. This paper is, therefore, the successor document and represents the entirety of the proposals on which the BAS is now seeking comment and on which the BAS envisages (subject to this consultation) it will base the Conceptual Framework.

SUMMARY

1.7 For the reasons set out in full in this paper, the BAS proposes that:

- The aim of the Conceptual Framework will be to set out a framework for technical actuarial standards (see section 2).

- The scope of BAS standards should cover all actuarial work which an entity is required to commission (by regulation or by virtue of a legal obligation to a beneficiary), together with any specific further areas that the BAS identifies. The geographic scope will be limited to work done in relation to the UK operations of entities. Other work falls outside the scope (see section 3).

- Standards will address actuarial work product, as well as the responsibilities of actuaries; standards will be principle-based, rather than rule-based, so as to avoid a "tick-box" mentality. Some standards will be generic across the range of actuarial work that falls within scope and some will be specific to a particular area of work (see section 4).

- The application of standards will depend on the circumstances in which the work was commissioned. For some work, standards will be compulsory, subject only to a *reasonability override*, while for other work standards will be subject either to a *Comply or Explain* rule or to a requirement to state whether the standard has been followed.

  For work which falls outside the scope of BAS standards, a commissioning entity may make it a contractual term that the actuarial work must comply with (selected) standards. There should also be no obstacle to an entity, a firm or an individual who is not an actuary asserting (if true) that information complies with BAS standards (see section 5).

- There are many differences between the calculations used by life insurance actuaries, general insurance actuaries and pensions actuaries that arise from the different objectives of the calculations and from the different regulatory regimes.

  The focus by pension scheme actuaries on *planning* as a major tool of financial management, while insurance actuaries focus on *valuations*, is a consequence of the different regulatory regimes. It would not be appropriate for the Conceptual Framework to attempt to force a convergence between the different calculations, unless or until the different objectives and the different regulations converge (see section 6).

- When probabilistic estimates are included in actuarial information, the information needs to be presented with great care if the information and its reliability are to be understood properly. Not all matters of uncertainty are susceptible to probabilistic analysis (see section 7).

- Building on the analysis and the conclusions set out in this paper, the Conceptual Framework will include a number of principles. Some will be overarching principles relating to actuarial work within the scope of standards and some will be specific to quantification issues. There should also be a generic reporting standard (see section 8).

RESPONSES TO THIS CONSULTATION PAPER

1.8 Details of how to respond to this paper are set out in Section 9, *Invitation to Comment*. Comments should reach the FRC by **31 January 2008**.

2 THE NATURE OF THE CONCEPTUAL FRAMEWORK

INTRODUCTION

2.1 In keeping with the proposals in the Morris Review,[1] the aim of the BAS's Framework Project is to produce a Conceptual Framework for standards. The focus on actuarial *standards*, rather than actuarial *reports* or actuarial *work*, is an important one and needs to be understood in order to set this consultation paper in its proper context.

2.2 The natural starting point for the BAS was to look at the accounting model, which has a conceptual framework for financial reports, *not* a framework for standards. This might suggest that the BAS should aim to produce a corresponding framework for actuarial reports.

2.3 But this analogy breaks down as soon as it is tested. To see why, one needs to understand that a *financial report* is not the same as an *accountancy report*. An *accountancy report* is any report produced by an accountant. Accountancy reports, as a general class, are not the subject of standards.

2.4 The term *financial report*, as used in the accounting conceptual framework,[2] is a specific type of report, regardless of who produces it. It is a financial statement required to give a true and fair view of the reporting entity's financial performance and financial position. A *financial report* is readily recognised by anyone working in business as a document containing a profit and loss account, a balance sheet and other such information.

2.5 In the actuarial world, there is no direct equivalent of the *financial report* and no direct equivalent of the *true and fair* objective from which one could reverse-engineer a definition of an actuarial equivalent to the *financial report*.

2.6 The range of actuarial work is discussed in Section 3 of this paper. Examples of actuarial work required by regulation range from a report on the calculation of reserves or provisions for a liability, to advice on funding principles (of a pension scheme) or risk capital required (by a life insurer). The BAS considers these examples alone to be sufficient evidence that there is no generic report or generic work product around which to base a conceptual framework, as distinct from a framework for standards.

2.7 The analysis in Section 3 of this paper, together with the results of this consultation, will determine the scope of work for which the BAS should develop actuarial standards.

STATUS AND PURPOSE OF THE CONCEPTUAL FRAMEWORK

2.8 The FRC[3] has set a strategic goal for actuarial practice that:

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[1] The Morris Review of the Actuarial Profession, paragraph 6.11

[2] The Statement of Principles for Financial Reporting, paragraph 6 of the Introduction

[3] The Financial Reporting Council is the UK's independent regulator responsible for promoting confidence in corporate reporting and governance. The BAS is an operating body of the FRC.

> Users of actuarial information can place a high degree of reliance on the information's relevance, transparency of assumptions, completeness and comprehensibility.[4]

BAS standards are a key component in the achievement of this goal.

2.9 The Conceptual Framework is being developed because knowledge of the principles and concepts to be adopted in BAS standards, and which will therefore underlie actuarial information, should assist those involved with actuarial work within the scope of BAS standards, whether as practitioners, as users who commission such work, or as third parties whose (financial) circumstances are potentially affected by the work. The principles should also assist practitioners and/or users faced with unforeseen issues to anticipate the likely direction of future standards which address those issues.

2.10 The Conceptual Framework will not be a standard, nor will it have the status of a standard. The Conceptual Framework will give coherence and consistency to BAS standards. The Conceptual Framework does not, of itself, create or impose any requirements on actuarial work. It is only when material appears in a BAS standard that it becomes a requirement. (Section 5 of this paper addresses the status and enforceability of BAS standards.)

TECHNICAL vs ETHICAL STANDARDS

2.11 The Conceptual Framework will apply to technical standards. Ethical standards are a separate matter. The Actuarial Profession has the initial responsibility for setting ethical standards, with the POB[5] having oversight of this process. The BAS has a reserve role to set ethical standards if asked to do so by the POB or if it otherwise considers this appropriate. But it is not the role of the BAS to set down the objectives, or the characteristics, of ethical standards before the Profession develops the individual standards (see, for example, Morris paragraphs 6.12-6.13).

2.12 The BAS is aware that there is not always a clear dividing line between what is ethical and what is technical. Prior to the Morris Review, the Actuarial Profession drew no such distinction and often combined both aspects in one standard. There was no reason, at the time, not to do so. The BAS and the Profession are aware that those of the Profession's standards which were adopted by the BAS at its inception contain some ethical material which will need to be removed from BAS standards (to reappear, if appropriate, in the Profession's own ethical standards). This exercise will take place in due course. But, so far as the Conceptual Framework is concerned, the boundaries between technical and ethical should not cause a problem.

For the reasons set out in this section, the BAS has concluded that the aim of the Conceptual Framework is to set out a framework for technical actuarial standards.

The BAS does not consider it necessary for respondents to comment on this proposal taken on its own. The scope of the framework, ie the range of actuarial work to be covered by standards, is addressed in Section 3, which provides a more suitable opportunity for any comments on the practical implications of approaching the framework in the manner described in this section.

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[4] The FRC's *Strategic Framework*, April 2007, Strategic Outcome Four.

[5] The Professional Oversight Board, another operating body of the FRC.

3 SCOPE OF THE CONCEPTUAL FRAMEWORK

INTRODUCTION

3.1 This section of the Consultation Paper addresses issues relating to the scope of the Conceptual Framework, ie actuarial work which the Conceptual Framework applies to. The question of scope is a crucial part of the Framework for two reasons:

a) It will be a requirement that any BAS standards which are designated as *generic* (see paragraph 4.4) must be applied to work which falls within the scope of the Framework.

b) *Topic-specific* standards will be developed only in relation to work which falls within the stated scope of the Framework. (This is not to say that a topic-specific standard will be developed for each and every area of work falling within the scope of the Framework, only that topic-specific standards will be limited to areas of work within the scope.)

3.2 The existence of generic standards will provide, where it is appropriate to do so, a cohesion across the range of work falling within the scope of standards. But, as discussed in later sections of this paper, there are logical and practical limits to the extent to which the range of actuarial work can be brought within one philosophy: there will need to be an appropriate balance between generic standards and topic-specific standards.

INFORMATION vs ADVICE

3.3 The Preliminary Consultation Paper (at section 1.2) drew a distinction between *actuarial information* used in financial decision making and *actuarial advice*. The BAS sought views on whether the priority should be to focus on standards that relate to *actuarial information*.

3.4 The majority of respondents favoured this approach, based on the descriptions of *information* and *advice* in the Preliminary Consultation Paper. But a significant minority expressed a view that the distinction between the two categories was not clear and asked for examples. Some respondents went further and challenged whether a distinction really existed at all.

3.5 The BAS believes that the distinction is valid. But the BAS also believes it is important that there should be clarity in the Conceptual Framework and standards without having to give ordinary English terms a special meaning, so the BAS has developed an alternative nomenclature based on the following reasoning.

3.6 One strand of actuarial work is to provide written reports which are required by regulation, the dominant purpose of which is to protect beneficiaries of a financial product, such as insurance policyholders and pension scheme members. The recipients of this category of reports are typically *not* the beneficiaries that the report is designed to protect. The recipients are often the providers of the financial product and/or their regulators.

3.7 In this context, it is not the purpose of the reports to identify a course of action designed to further the best interests of the report's recipient (broadly,

advice). The aim is typically to provide the recipient with facts and figures which the draftsman of the regulations believed would further the goal of consumer protection and/or the avoidance of moral hazard (*information*).

3.8 This description does not provide a watertight distinction between *advice* and *information*. There is, as several respondents to the Preliminary Consultation Paper have implied, room for a semantic debate about which of the words "information" and "advice" is truly the more applicable word to use in each case. In light of that feedback, the BAS intends to use a different, and more precise, way to categorise actuarial work (see paragraph 3.9 below), which builds on the distinction described above, without depending on the words *information* and *advice*.

CATEGORISING ACTUARIAL WORK

3.9 The BAS has identified the following categories of actuarial work, each of which is explained in more detail in the paragraphs that follow:

A Work that an ***entity is required***, by regulation or by virtue of a legal obligation to a beneficiary, ***to commission from an actuary***;

B Work that an ***entity is required***, by regulation or by virtue of a legal obligation to a beneficiary, ***to commission, not necessarily from an actuary***;

C Work ***not covered by A or B*** above, ***but relating to classes of assets or liabilities*** falling ***within the scope of*** any work covered by ***A or B***

D Work ***relating to classes of assets or liabilities*** falling ***outside the scope of*** any work covered by ***A and B***

E ***Monitoring*** the work of another actuary.

3.10 The term *regulation* is used in the definition of Categories A and B with its ordinary English meaning of a rule or order issued by an appropriate authority. This is a wide definition – deliberately so – which embraces primary and secondary legislation (Acts of Parliament and Statutory Instruments) and also pronouncements by those with executive authority to make binding statements, including for example accounting standards.

3.11 In the context of actuarial work, an entity's "legal obligation to a beneficiary" is encountered frequently in a pension scheme trust deed and in an insurance policy. But there may be other, less common, examples such as a family trust or the settlement of a personal injury claim which calls for an actuary to be engaged in certain circumstances.

3.12 The term "legal obligation" in the definition of Categories A and B should be interpreted widely to embrace any legally enforceable obligation on the entity. The additional words "to a beneficiary" are crucial. A contract between an entity and an actuary does not bring the work into Categories A or B – unless a beneficiary is also party to the contract. The obligation to have the work performed must be enforceable by a beneficiary if the work is to fall within the definition.

3.13 The use of the word *commission* in Categories A and B may appear a little alien to in-house actuaries who carry out work in accordance with their day-to-day responsibilities, rather than waiting for someone to "commission" a piece of work from them. It is not the BAS's intention to create a sense of

distance between in-house actuaries and the category definitions. The BAS merely wishes to reflect the fact that the entity and those whom it employs are separate legal persons. When an in-house actuary carries out a piece of work because it is part of his or her responsibilities, the work was effectively commissioned when the individual was appointed to the role.

Category A: Work that an entity is required, by regulation or by virtue of a legal obligation to a beneficiary, to commission from an actuary

3.14 Category A covers work that an entity is required, in a given set of circumstances, to commission and which must, by virtue of the governing regulations or some other legal obligation to a beneficiary, be commissioned from an actuary. This category relates mainly to pension schemes, insurance companies, friendly societies and the like. But there are other, less well-known examples, such as pre-paid funeral plans.

3.15 The list below contains examples of work that falls into Category A, showing whether the inclusion arises by virtue of regulation or some other legal obligation:

- assessments of the liabilities and/or regulatory capital for life insurance companies *(regulation)*
- assessments of the technical provisions for pension schemes *(regulation)*
- assessments of the liabilities of a Lloyd's syndicate *(regulation)*
- assessment of the liabilities of a pre-paid funeral plan *(regulation)*
- release of surplus in a pension scheme, for example to grant benefit increases *(trust deed)*
- reviewing the terms of a long term insurance contract after inception, for example a premium rate review or a *market value reduction* in the benefits payable under a unitised contract *(contract)*.

3.16 For the avoidance of doubt, the decisive factor in the definition is that the form and content of the work are prescribed by some legal instrument, not that the requirement be unconditional. So, for example, the requirement for a pre-paid funeral plan to obtain an actuarial report applies only if the plan wishes to be exempt from certain other regulatory requirements. That is sufficient to bring the work within the definition of Category A.

3.17 It seems fairly clear that work in this category must fall within the scope of BAS standards and, therefore, within the Conceptual Framework. Producing standards for actuarial work in this area – particularly actuarial work required by regulation – is the reason why the BAS was created.

Category B: Work that an entity is required, by regulation or by virtue of a legal obligation to a beneficiary, to commission, not necessarily from an actuary

3.18 Examples of work that often falls within Category B (work which must be performed, but not necessarily by an actuary) include:

- assessments of the liabilities of general insurance companies
- reports in connection with the transfer of an insurer's book of business.

3.19 The decision whether to include Category B within the scope of BAS standards is not so clear-cut. On the one hand, the potential benefits to be gained from the creation of actuarial standards do not vanish simply because the regulators do not compel the use of an actuary.

3.20 On the other hand, although the BAS can mandate that, if an actuary is appointed to do the work, the actuary must comply with actuarial standards, the fact that the work in question does not, by definition of the category, have to be commissioned from an actuary means that the BAS has no standing to insist that the entity acts upon the information or outputs produced by the actuary.

3.21 There could even be a risk that, if the BAS creates standards which bite on work done by actuaries, but not on work done by others, entities may, on occasion, be deterred from choosing an actuary for the work, for example if the result of following actuarial standards is expected to be adverse to the entity's own interests. This does not appear to have been the case with such standards set by the Actuarial Profession, but it is an issue that the BAS considers important to address in the context of a new Conceptual Framework.

3.22 The BAS's proposal for addressing this issue is that, in relation to work for which it is not compulsory to commission an actuary, the standards would, similarly, not be compulsory (for actuaries). Instead the standard would be designated as *Comply or Explain*. This category of standard is discussed in more detail in paragraph 5.12 below but, put simply, actuaries would be free *not* to follow the standard so long as they provide, in connection with each piece of work, *either* an alternative set of outputs based on the relevant standard, *or* their reasons for not applying the standard to the work.

3.23 But, whilst the BAS takes the view (as did the Profession before it) that Category B should, therefore, be within the scope of standard setting, that is not to say that every piece of regulatory work potentially commissioned from an actuary requires a standard. Judgment will need to be exercised on a case-by-case basis, taking into account the results of an *Impact Assessment*, in line with standard FRC practice.

3.24 There is also the possibility, discussed in paragraph 5.8 below, that the regulator of the relevant entity may require the work to comply with a BAS standard. That would be a matter for the regulator.

3.25 The BAS is not sure whether the non-regulatory part of Category B exists in practice, ie whether there are instances where actuaries are typically chosen to comply with the requirement in a legal document which calls for a report to be commissioned, but not necessarily from an actuary. The BAS would welcome feedback from respondents on the existence of any such instances.

Category C: Work not covered by A or B above, but relating to classes of assets or liabilities falling within the scope of any work covered by A or B

3.26 The key feature of work which falls into Categories C and D is that the entity has the work performed at its own discretion, to meet a need that it determines for itself and with terms of reference which the entity is free to choose.

3.27 The difference between Category C and Category D is that Category C is work within the realms of insurance, pensions and any other industries that

use actuaries to comply with regulations or other legal obligations. Hence the reference to Categories A and B in the definition.

3.28 The distinction between Categories C and D does not matter if both categories are included within the scope of BAS standards or both excluded from scope. The distinction matters only if one category is placed within scope and one category is excluded. Examples of Category C work include:

- any advice or commentary on pricing and/or profit-testing of insurance contracts that falls *outside* the formal actuarial monitoring of premium adequacy required by FSA regulations
- asset allocation
- appraisal values for life insurance mergers and acquisitions
- pension scheme assessments for mergers and acquisitions activity relating to the sponsoring employer
- any advice or commentary on a pension scheme's funding strategy that falls *outside* the formal (triennial) valuation required by regulation and/or the trust deed
- risk management.

3.29 This work has far wider range and diversity than the work covered by existing standards. To bring this category of work, as a whole, into the scope of actuarial standards would be a very significant increase in regulation. The sheer scale of the expansion is not, of itself, a justification for not going ahead, especially if the expansion can be justified. But, at this stage, coming so soon after the Morris Review, which did not propose such a change, the BAS believes that the inclusion of Category C, as a whole, could only be justified if there was substantial new evidence that regulation on this scale was now required.

3.30 Furthermore, given the criteria for inclusion in Category C, the BAS would expect Category C work typically to be planned and executed in a way best designed to further the interests of the report's recipient (which may be a representative of the beneficiaries, but could be someone else). The BAS believes, in keeping with the FRC's regulatory philosophy, that such circumstances are not normally matters in which it is suitable for the BAS to intervene.

3.31 This is not to say that the BAS rules out the possibility that individual areas of work within Category C might become the subject of standards as and when appropriate. Moreover, an entity commissioning Category C work is, of course, at liberty to make it a contractual term that the actuary must comply with one or more BAS standards of the entity's choosing. A contractual term of that nature would be particularly appropriate in cases where, contrary to the generality described in the previous paragraph, an entity commissions a report from an actuary with the aim of assisting some party *other* than the commissioning entity.

3.32 The proposal to omit Category C from the scope of the standards (save for any specified individual areas of work) does not mean that work within this category is free from any scrutiny or comeback in the event of its inadequacy. *Any* work by an actuary that falls below the standards of (amongst other things) competence and professional judgement reasonably expected of an

actuary leaves the actuary liable to a charge of *misconduct*, punishable through disciplinary channels. BAS standards are only one factor in determining whether there has been misconduct. The issue for the Conceptual Framework is to determine which matters can and should be set down in technical standards in advance of the work being done (or commissioned).

Category D: Work relating to classes of assets or liabilities falling outside the scope of any work covered by A and B

3.33 Category D covers work outside the realms of insurance, pensions etc. There are many actuaries who have moved away from the traditional fields of insurance, pensions and similar entities and this is something which is seen as beneficial to the profession as a whole (see, for example, the Morris Review at paragraphs 1.70-1.71).

3.34 Examples of work done by actuaries outside the traditional fields have included:

- calculating the provision required to meet the cost of a customer loyalty program (eg air miles)
- advice on the decommissioning provision for a nuclear power plant
- pricing models for utility companies.

3.35 In the view of the BAS, it is not generally practical for work falling within Category D to be included within the scope of BAS standards. But the BAS does not rule out the possibility that individual areas of work within Category D might become the subject of standards as and when appropriate. As with Category C above, any work which falls below the acceptable levels of competence and professional judgement will leave the actuary liable to a charge of misconduct and any entity commissioning Category D work is at liberty to make it a contractual term that the actuary must comply with one or more BAS standards of the entity's choosing.

Category E: Monitoring the work of another actuary

3.36 Examples of Category E work include:

- compliance monitoring of pension scheme actuaries as required by the Profession
- reviewing, for an auditor, pension scheme costs in the sponsoring employer's accounts
- the work of the Reviewing Actuary in relation to life insurance.

3.37 This work falls outside the agreed scope of the BAS. The general proposition is that the BAS sets standards for original actuarial work. Any audit of that work should have regard to the BAS standards set for the work, but the BAS will not set additional standards for the audit of such work. Specifically:

- Compliance monitoring in relation to pension schemes was deliberately left with the Profession when the BAS was created (see the Profession's GN 48).
- An actuary commissioned by an auditor to review pensions information in the employing company's accounts is part of the audit function. The

actuary will need to take into consideration any standards applicable to the accounting entity's calculation of pension costs, but it is not for the BAS to write any additional standards that apply only to the auditor, or the actuary appointed by the auditor.

- The equivalent proposition is true of the role of the Reviewing Actuary in life assurance. The Reviewing Actuary will need to take into consideration any standards applicable to the work being reviewed, but it is not for the BAS to write any additional standards that apply only to the auditor, or the Reviewing Actuary.

GEOGRAPHIC SCOPE

3.38 The geographic scope of BAS standards will be limited to work done in relation to the UK operations of entities (regardless of the location, or domicile, of the person carrying out the work).

REFINING THE CATEGORY DEFINITIONS

3.39 Constructing the category definitions has been a particularly difficult challenge, because the range of work potentially undertaken by actuaries is very diverse. The BAS believes that the definitions in this consultation paper achieve their objectives, but it would welcome any feedback from respondents identifying examples of work which appear to fall within the scope of BAS standards when they should be outside or vice versa.

The scope of the Framework will identify:

- those areas of work to which generic BAS standards must be applied; and
- those areas of work for which topic-specific standards may be developed.

For the reasons set out in this section:

- the BAS has determined that Category A falls *within* the scope of BAS standards and that Category E falls *outside* the scope.
- the BAS is of the opinion, subject to consultation, that:
  - Category B should also be *within* the scope of BAS standards, with the status of *Comply or Explain*, as described in paragraphs 5.12-5.14; and
  - Categories C and D should be *outside* the scope of BAS standards, save for any specific areas that the BAS decides, in future, to include, but that there should be no obstacle to a commissioning entity making it a contractual term that the actuary must comply with standards of the entity's choosing.

The BAS would welcome respondents' views on whether they consider the five categories drawn up by the BAS provide a meaningful way to determine which areas of work should be within scope and which should not. More specifically, which, if any, of Categories B, C and D should be within the scope of the framework? The BAS would also welcome feedback and real examples (a) indicating whether the non-regulatory element of Category B exists in practice (see paragraph 3.25) and (b) illustrating any concerns that the definitions are wrongly capturing or omitting areas of work.

4 OBJECTIVES AND CHARACTERISTICS OF STANDARDS

INTRODUCTION

4.1 As foreshadowed in the Preliminary Consultation Paper, BAS standards will set out concepts, principles, rules and terminology from which those complying with standards will be able to determine the (range of) permitted techniques, methodologies and assumptions to be applied to their work.

4.2 At the highest level, all standards must contribute to the strategic aim that users of actuarial information can place a high degree of reliance on the information's relevance, transparency of assumptions, completeness and comprehensibility (see paragraph 2.8). The primary goal of BAS standards will be to benefit society at large.

4.3 Beyond that, each BAS standard will have its own specific objectives. The objective will be identified, standard by standard, and clearly stated in the standard when each one comes to be written.

SPECIFIC vs GENERIC STANDARDS

4.4 Individual standards will be *either*:

a) limited to a specific context, for example a standard relating to the *technical provisions* of pension schemes; or

b) generic to all work falling within the scope of the Conceptual Framework (ie on the basis of the proposals in Section 3 of this paper, Categories A and B and any specific areas from Categories C or D designated within scope by the BAS in future).

4.5 Section 8 of this paper sets out some thoughts on a potential Reporting Standard which would be generic to the areas of work within the scope proposed in this paper. The extent to which any additional aspects of actuarial work might be the subject of generic standards is outside the scope of the Conceptual Framework and will be discussed once the Framework is in place.

PRINCIPLE-BASED vs RULE-BASED REGULATION

4.6 In ordinary English usage, the terms *principle* and *rule* are often interchangeable. But, despite this, the term *principle-based regulation* is frequently used in contradistinction to *rule-based regulation*. In the view of the BAS, the primary point which people seek to make by contrasting those two terms is the difference between the so-called "tick-box" mentality which often accompanies a *rule-based* approach and a more thoughtful application of regulations which a *principle-based* approach seeks to engender.

4.7 On that basis, a *rule-based* approach to regulation might be characterised as one in which the regulations are designed to be complied with to the letter, whereas a *principle-based* approach is one in which the regulations are designed in a way which permits them to be applied in spirit. The BAS intends to use the terms in that way.

4.8 The BAS's intention is that standards will primarily be principle-based. The principles will be articulated at a level of detail sufficient to enable those carrying out work within the scope of a standard to have a clear understanding of what is required in order to comply with the standard. This does not, therefore, exclude specific rules, where appropriate, as a means to convey the requirements of the standard. But neither does it exclude a standard (or a part of a standard) stating only the principle(s) to be followed.

4.9 The principles underlying BAS standards will follow from the Conceptual Framework (see, in particular, Section 8 of this paper) and will be explained and justified in a way which enables the reader of a standard to follow the reasoning from the underlying concept through to the specific principles adopted. More generally, BAS standards will aim to include sufficient contextual explanation for a reader to understand the standard without being an expert in the subject. The objective, across all BAS standards, will be that standards should be intelligible not only to lay readers, but also to readers (whether lay or actuarial) who are new to the business context.

4.10 The BAS envisages that the more generic the scope of a standard the more likely it is that the standard can be completely (or predominantly) defined by principles without spelling out detailed rules. The document setting out the Scope and Authority of standards (see paragraph 5.13) will explain that compliance with a standard depends critically on applying the general principles contained in that standard, as well as following any detailed rules.

4.11 Without tying its hands over the precise format in which standards will be expressed, the BAS envisages that standards will address the exercise of judgment by actuaries in a variety of ways. For example, standards relating to the selection of an individual assumption might be expressed by way of:

a) *quantitative limits*, for example that the assumption should be set within specified numerical boundaries;

b) *qualitative prescription*, for example that the assumption should be determined by reference to a stated criterion; or

c) *qualitative aspirations*, for example that the assumption should reflect recognised and authoritative views and not merely the individual actuary's personal views (or vice versa, in circumstances where it is the case-specific judgment of the individual that is paramount).

OUTPUTS vs RESPONSIBILITIES

4.12 Some of the material in the existing actuarial standards (developed originally by the Profession and adopted by the BAS at its inception) addresses the *outputs* of actuarial work (or the *inputs* and *processes* leading to outputs). Other material addresses the *responsibilities* of actuaries.

4.13 In this context, the *outputs* of actuarial work would be, for example, the results of a calculation and the *processes* would be the calculation itself and all the elements, including assumptions and other inputs, that go to making up the calculation. The *responsibilities* of actuaries would be the duties they are under, typically (in the context of standards) as a result of regulations.

Outputs

4.14 The BAS intends that output based standards should be expressed in terms of the output itself, rather than the person carrying out the work. So, for

example, BAS standards will use language of the form "the report should include …" or "the assumptions should be derived from …", rather than "the actuary should report on …" or "the actuary should derive the assumptions from …".

4.15 At one level, this is simply a matter of writing style. It has no implications for the enforceability of the standards (see Section 5 for the authority and enforceability of BAS standards). But the approach is also consistent with the fact that, increasingly, the emphasis of prudential regulation in the actuarial field is on the users of actuarial services making decisions, rather than deferring to the actuarial adviser. The BAS considers it appropriate to reflect this change in emphasis by writing standards in a form which focuses on the work, rather than the actuary.

Responsibilities

4.16 Where responsibilities fall on the holder of a particular post or appointment, such as a Scheme Actuary, Actuarial Function Holder or skilled person (for example in relation to the transfer of a book of insurance business – see paragraph 3.18), the standards will need to focus on the post-holder and the attaching responsibilities.

COMMON FEATURES OF ACTUARIAL WORK WITHIN CATEGORIES A AND B

4.17 Actuarial work falling within the scope of Categories A and B, ie work that an entity is required to commission (whether or not from an actuary), has a number of common characteristics:

a) Protection

Typically, the regulatory element of actuarial work in Categories A or B is part of a process designed to protect beneficiaries or to ensure equity between the rights of the entity and its beneficiaries or between the competing rights of different groups of beneficiaries.

b) Judgment

The output of the work may depend on judgmental matters or it may be derivable in an objective fashion. Where judgment is required, the exercise of that judgment may fall to the actuary or it may be for the entity to make the judgments (perhaps on the advice of the actuary) and for the actuary to make a technical calculation in accordance with those judgments. So, for example, the assumptions used to calculate a pension scheme's *technical provisions* are to be decided by the trustees with the agreement of the employer and advice from the actuary, but the calculation is to be carried out by the actuary.

c) Content

When reports are required as part of work falling within Categories A and B, the governing regulations or other legal document typically stipulate what is to be the content of the report. The content might be a specific result, such as the calculation of *technical provisions*, as cited above, or a conceptual description, such as advice on the assumptions to be used. The governing document will also stipulate who are to be the addressees of the report and who, if anyone in addition, is to be sent a copy.

d) Responsibility

Sometimes, as noted in paragraph 4.16, regulations specify an ongoing responsibility to be exercised, rather than a periodic report to be written, for example the ongoing responsibility of the Actuarial Function Holder of a life company to monitor the adequacy of premiums. It is unusual for a pension scheme deed or an insurance policy contract to create an ongoing responsibility to be discharged by an actuary, but it can arise.

COMMON FEATURES OF ACTUARIAL WORK WITHIN CATEGORIES C AND D

4.18 As set out in paragraphs 3.30 and 3.35, the BAS is of the view, subject to this consultation, that Categories C and D should fall outside the scope of BAS standards save for any specific areas that the BAS decides, in future, to include.

4.19 Given that, by definition, the entity is under no obligation to commission Category C or Category D work, nor to use an actuary for the work, there are unlikely to be many (if any) common characteristics for this type of work so far as the origin of the work or its terms of reference are concerned – especially in the case of Category D (work for entities outside the traditional fields of actuarial work).

For the reasons set out in this section:

- some standards will be generic across the range of actuarial work that falls within the scope of the Conceptual Framework (ie Categories A and B, together with any specific areas of Categories C or D that the BAS decides, in future, to include if the proposals in this paper are adopted following consultation), and some will be specific to a particular area of work;

- standards will be principle-based, rather than rule-based, in the sense used in paragraphs 4.6-4.7, ie designed to avoid a "tick-box" mentality: this does not exclude specific rules, where appropriate, as a means to convey the requirements of the standard, but compliance with standards will depend more critically on following the principles, rather than the rules;

- standards will address the actuarial work product, as well as the responsibilities of actuaries; standards for outputs will be written so as to focus on the users of actuarial services and meeting their needs as decision makers.

The BAS would welcome respondents' views on the proposals set out above, specifically the proposals:

- **to introduce (some) generic standards, in addition to topic-specific standards as is the case now;**

- **that standards will be *principle-based*, rather than *rule-based*; respondents are asked to identify any advantages and/or disadvantages that they consider may flow from this approach; and**

- **that standards will address outputs and responsibilities, as now, with output-based standards focusing on the users of actuarial services and their needs as decision makers**.

5 ENFORCEABILITY OF STANDARDS

INTRODUCTION

5.1 This section of the Consultation Paper addresses issues relating to the enforceability of standards, having regard, in particular, to the implications of the issues of scope identified in Section 3. This section explains proposed changes from the way standards originated by the Profession are currently classified.

COMPULSION vs RECOMMENDATION

5.2 When the Actuarial Profession was responsible for issuing technical standards, published under the label *Guidance Notes* (or *GNs*), some of them – approximately half – were in effect recommendations. These GNs, classified as *Recommended Practice*, were in the nature of (short) manuals of good practice with little or no compulsion attaching to them. The remainder of the GNs were effectively compulsory and classified as *Practice Standard*. A more precise description of each status is set out in paragraphs 5.19-5.20 below, but the description is not necessary for a discussion of the enforceability principles to be adopted in the Conceptual Framework.

5.3 The existence of GNs with the *Recommended Practice* classification was a mechanism by which the Profession published, as "guidance", material whose content had been carefully considered and subjected to consultation before it was issued, even though its enforceability might be little higher than a textbook of good practice.

5.4 The Profession has indicated that it intends to continue issuing helpful material with the intention that the material will provide background information and educational content, including a "balanced digest" of conflicting views on actuarial techniques. The Profession has explained on its web site that the material, to be known in future as *Information and Assistance Notes* (or *IANs*), will supplement and not contradict regulatory requirements or standards produced by the BAS.

5.5 In the context of the long term goal of the BAS to pursue continuous improvement in actuarial standards, reflecting evolving commercial practices, economic developments and expanding actuarial know-how, the professional body has a key role to play (along with other organisations) as a source of new ideas and a means for conducting and co-ordinating research. The BAS wishes to encourage that role.

5.6 The BAS is likely to carry out research of its own, in the context of its standard-setting role, and will publish the results as and when appropriate. But the BAS does not intend to develop "manuals of good practice", or the equivalent by another name. The BAS does not consider that such activity is necessary or conducive to carrying out its functions under the legislation which enabled the creation of the BAS[6] or under the Memorandum of Understanding between the Actuarial Profession and the FRC.

[6] Companies (Audit, Investigation and Community Enterprises) Act 2004, Section 16, as amended by the Companies Act 2006, Section 1274.

COMPULSION: ENTITIES vs ACTUARIES

5.7 At present, the authority of BAS standards is over actuaries – specifically, members of the Institute of Actuaries and the Faculty of Actuaries – not over the entities that commission work from actuaries. This authority derives from clauses in the Disciplinary Schemes of the Profession and of the AADB,[7] which make BAS standards a relevant factor in the determination of professional misconduct. The BAS itself has no power of investigation or punishment: this power is exercised by the Profession, overseen by the POB, and by the AADB in cases of public interest.

5.8 BAS standards are not enforceable against entities unless the entity's own regulator creates regulations imposing one or more BAS standards on their regulatees. In practice, where the entity is legally required to use an actuary and the actuary is required to adopt BAS standards, the entity's regulator has tended to make regulations applying BAS standards (or the Profession's standards, before the creation of the BAS) to the entities.

5.9 If the regulator does not extend a BAS standard to the regulated entity, the entity itself cannot be forced to comply with the standard, but any actuary who does not follow the standard may be liable to disciplinary action.

5.10 The BAS can create standards that the actuary must comply with even where the entity is not obliged, in law, to use an actuary or to adopt BAS standards itself. But imposing standards on work that does not have to be commissioned from an actuary could create a risk that entities may, on occasion, be deterred from choosing an actuary for the work, for example if the result of following actuarial standards is expected to be adverse to the entity's own interests.

5.11 This does not appear to have been the case with such standards set by the Profession, but that provides reassurance only that it has not been a problem so far. The possibility that beneficiaries might in future be disadvantaged if the framework of actuarial standards created an unintended encouragement to entities to avoid using actuaries, and thereby to sidestep BAS standards in times of difficulty, is plainly something that is important for the BAS to address at the outset of a new Conceptual Framework.

5.12 The BAS's proposal for addressing this issue is that, ***in relation to work for which it is not compulsory to commission an actuary***, the standards would, similarly, not be compulsory (for actuaries). Instead the actuary would be required to *comply or explain*. In essence, the actuary would be free *not* to follow the standard so long as the actuary identified any non-compliant work and provided with it *either*:

a) an additional set of outputs compliant with the relevant BAS standard (and identified as such); *or*

b) reasons which justify the actuary's decision not to apply the relevant BAS standard to the work.

5.13 The BAS does not propose that the additional set of outputs (option (a) above) should be required in every instance of non-compliance, because the additional calculations may be costly (and therefore a deterrent to using an

[7] The Accountancy & Actuarial Discipline Board, another operating body of the FRC.

actuary), depending on how closely the actuary's methodology tracked the methodology(ies) compatible with the standard. But the BAS does intend that the alternative option (b) should require the actuary to give proper reasons to justify the decision not to apply the standard. The rule will be formulated (in a document setting out the Scope and Authority of BAS standards) in such a way that failure to provide outputs that comply with the standard or to give *proper* reasons will potentially be an act of professional misconduct in itself.

IMPLEMENTATION OF *COMPLY OR EXPLAIN*

5.14 The *Comply or Explain* proposal described above does not entail the BAS designating some standards as *Comply or Explain* and designating others with an alternative label. The BAS intends that *all* standards would, in future, have the same status, but the practical implications will vary according to the circumstances in which the work was commissioned, rather than varying, as now, according to the nature of the work. The status would be set out in a document describing the Scope and Authority of all BAS standards, along the following lines:

- For Category A, ie any work commissioned in circumstances where the entity is legally required (by regulation or by virtue of a legal obligation to a beneficiary) to commission an actuary, the applicable standards would be compulsory, subject only to the *reasonability override* described in paragraph 5.15 below.

- For Category B, ie any work commissioned in circumstances where the entity is at liberty to commission someone other than an actuary, the applicable standards would be subject to the *Comply or Explain* rule described in paragraph 5.12 above.

- For Categories C and D, ie work that the entity is not required to commission at all, whether from an actuary or anyone else, the proposal set out in Section 3 of this consultation paper is that the work would be outside the scope of BAS standards save for any specific areas that the BAS decides, in future, to include. For any specific areas which the BAS decides to include in this way, the *Comply or Explain* rule would apply just as for Category B.

  If, contrary to the current proposal, the BAS were to decide following this consultation that the *whole* of Categories C or D should be within the scope of BAS standards, the BAS would need to decide the status of standards in relation to such work.

  One possible approach, given that, by definition, the entity is under no obligation to commission Category C and Category D work, is that BAS standards should not limit the entity's freedom to set the terms of reference for the work. Accordingly, unless the commissioning entity made it a contractual term that (selected) BAS standards be followed, the actuary would be required only to *state* which of the standards applicable to the work in question had been followed and which had not.

  Alternatively, the applicable standards could be subject to the same *Comply or Explain* rule as work falling within Category B, as described in paragraph 5.12 above.

REASONABILITY OVERRIDE

5.15 To protect against (unforeseen) circumstances in which it would be positively wrong or misleading to apply a particular standard, the actuary will be permitted to depart from the standard, but only so long as the departure is identified in the document communicating the information or outputs, accompanied by reasons which justify the actuary's decision not to apply the standard to the work. This rule (formally set out in the Scope and Authority of BAS standards mentioned in paragraph 5.13 above) will be known as the *reasonability override*. Failure to have *proper* reasons for the departure, or to include them with the work product, will potentially be an act of professional misconduct in itself.

5.16 The *reasonability override* would be most directly applicable to work in Category A, because BAS standards would be compulsory in the absence of the override. In the case of work for which BAS standards are designated *Comply or Explain*, the "explain" option already enables departure from the standard, subject to giving (proper) reasons.

ACTUARIES WORKING AS PART OF A TEAM

5.17 At present, and as noted in paragraph 5.7, the authority of BAS standards is over actuaries, not over the entities that commission work from actuaries. When one or more actuaries work as part of a team alongside non-actuaries, with the actuaries contributing only part of the work, BAS standards would not apply unless one or more of the actuaries in the team takes responsibility for the final product. Specifically:

a) Work in Category A must, by definition, be carried out by an actuary, so BAS standards must apply.

b) Work in Category B does not have to be carried out by an actuary. When the work is carried out by an actuary, he or she may be assisted by one or more non-actuaries. The status of Category B work within the scope of BAS standards (with the *Comply or Explain* status) would be undermined if introducing a non-actuary into the team enabled the work to be declared out of the scope.

   For this reason, the rule (to be set out formally in the Scope and Authority of BAS standards mentioned in paragraph 5.13 above) will be that BAS standards will apply (with the *Comply or Explain* status) only if an actuary is in overall charge of the work. For this purpose, an actuary is defined as being in "overall charge" of the work, if he or she has the authority to determine the content of the report.

c) Subject to this consultation, work in Categories C or D will be outside the scope of BAS standards, save for any specific areas that the BAS decides to include. For those areas of work within Categories C or D which the BAS determines to be within the scope of standards, the rule would be similar to that for Category B. The rule (to be set out formally in the Scope and Authority of BAS standards) will be that BAS standards will apply (with the status applicable to Categories C and D) only if an actuary is in overall charge of the work.

VOLUNTARY COMPLIANCE: ENTITIES vs ACTUARIES

5.18 So far as the BAS is concerned, even though an entity, a firm or an individual who is not an actuary may not be obliged to apply BAS standards, there

should be no obstacle to them doing so and, if they do apply the standards, asserting that the information they have produced "complies with BAS standards."[8]

STATUS OF GNs ORIGINATED BY THE PROFESSION

5.19 The status of GNs originated by the Profession and classified as *Recommended Practice* is that there is no explicit obligation to comply with such a standard. But if the actuary fails to follow such a *Recommended Practice* standard and the resulting work is of a quality which renders the actuary liable to a charge of misconduct, the failure to follow the *Recommended Practice* standard or to disclose the deviation at the relevant time might be an aggravating factor.[9]

5.20 The other classification adopted by the Profession for its GNs bears the label *Practice Standard.* This term is explained by the Profession as meaning that a material breach of a GN classified as *Practice Standard* is of itself a ground for referral under the Profession's and/or AADB's Disciplinary Schemes and amounts to strong prima facie evidence of misconduct. A finding of misconduct in such circumstances can normally be avoided only if the actuary can show that there was reasonable justification for the departure from strict compliance with the standard and that the departure had been adequately disclosed to the recipients of the report at the relevant time.[10]

For reasons set out in this section, the BAS has concluded that:

- it does not intend to develop standards that amount only to recommendations;
- all BAS standards will have the same status as each other, ie failure to comply or to explain non-compliance, with proper reasons, where non-compliance is a permitted option, will render the actuary liable to disciplinary action under the Profession's and the AADB's Disciplinary Schemes;
- the application of standards will depend on the circumstances under which the work was commissioned from the actuary:
  - for work commissioned in circumstances where the entity is legally required (by regulation or by a legal obligation to a beneficiary) to commission an actuary, standards will be compulsory, subject only to the *reasonability override* described in paragraph 5.15;
  - for work commissioned in circumstances where the entity is required to commission or perform the work, but is at liberty to have the work performed by someone other than an actuary, standards will be subject to the *Comply or Explain* rule described in paragraphs 5.12-5.14; and

[8] In light of the responses to the Preliminary Consultation Paper, this phrase replaces the previously suggested phrase "Compliant with Standard Actuarial Principles and Techniques."

[9] This description is a paraphrasing of paragraph 4.3 of the *Professional Conduct Standards* (or *PCS*), the Profession's primary statement of ethical conduct.

[10] This description is a paraphrasing of paragraph 4.2 of the *PCS*.

- for work that the entity is not required to commission, whether from an actuary or anyone else, and which the BAS specifically includes within the scope of BAS standards, the same *Comply or Explain* rule will apply; but if (contrary to the proposal in this consultation) the BAS were to decide that *all* such work should be included within the scope of BAS standards, the BAS will need to decide whether the actuary will be required only to *state* whether the applicable standards had been followed or whether alternatively the standard will be subject to the *Comply or Explain* rule.

The BAS would welcome respondents' views on any practical issues or problems that respondents consider should be addressed in order to ensure the efficient functioning of the proposal.

6 ACTUARIAL METHODS FOR QUANTIFYING LIABILITIES

INTRODUCTION

6.1 Actuarial work calls for a variety of calculations to be made. Many of the calculations have historically been described by actuaries as "values." In current practice, these values are calculated in a variety of different ways, suggesting to some observers that there is, perhaps, no common philosophy or recognised approach to the process of valuation in modern actuarial thinking.

6.2 The following paragraphs suggest that many of the differences – but not necessarily all of them – are attributable to the diversity of existing regulatory regimes and the purposes for which the values are required.

EXAMPLES OF CALCULATIONS FOR REGULATORY PURPOSES

6.3 It is instructive to identify the differences before discussing the reasons for them. The following list contains examples of some of the calculations carried out by actuaries in connection with current regulatory requirements, coupled with a brief description of the calculations. The descriptions are couched in terms designed primarily to highlight the differences between the listed calculations, rather than the similarities. A comparison is set out in paragraph 6.6 below.

6.4 ***It is not necessary for readers to be familiar with the terms highlighted in italics.*** The terms are included merely to identify the calculations for those who are familiar with the terminology. The brevity of the descriptions means, inevitably, that they entail some loss of accuracy. But this need not be a cause for concern to readers, so long as the descriptions, taken as a whole, achieve their purpose of demonstrating (at least some of) the differences across the range of actuarial calculations. For the same reason, the list is not exhaustive.

6.5 All of the calculations described below have the common feature that they are designed to derive a single monetary amount which equates to a stream of uncertain future cash flows.

Life insurance

1 *Mathematical (liability) reserves*: This calculation arises under the *regulatory peak* of the FSA's *twin peaks* regime for determining regulatory capital. The estimated cash flows are *discounted* back to the valuation date. The FSA requires the calculation to include margins for adverse deviation in estimating the amount of the future cash flows and in allowing for the potential returns on current investments and, separately, on the (re)investment of future cash flows. The margins relating to investment returns are the subject of specific FSA rules. For this calculation, the FSA does not require any provision for future terminal bonuses on with-profit business.

2 *Realistic value of liabilities*: This calculation arises under the *realistic peak* of the FSA's *twin peaks* regime. Unlike the *mathematical reserves* (above), this calculation includes no margin for adverse deviation: it is intended to be a best estimate. But this calculation does include an allowance for future

terminal bonuses (as well as annual bonuses), either explicitly in a *prospective calculation*, in which estimated cash flows are *discounted* back to the valuation date using the *gross premium method*, or implicitly in a *retrospective* calculation of *asset shares*, calculated by reference to the accumulation of premiums plus actual investment returns earned, less the various charges (eg for expenses, guarantees and the relevant insured risks) and tax.

3 *Value of liabilities in the company accounts*: For listed companies, and those having with-profit funds above a specified level, this calculation is based on the realistic value of liabilities described in 2 above. Otherwise, the calculation is a modified version of the calculation of the mathematical reserves described in 1 above.

General insurance

4 *Value of liabilities in the company accounts*: This calculation must be sufficiently prudent to cover future (incurred) claims as far as can reasonably be foreseen. The estimation of future claim amounts is typically based on an extrapolation of past experience, together with an allowance for future inflation. *Discounting* is prohibited except for categories of claims expected to be paid at least four years after the accounting date. The assumed investment return (if one is applied) is subject to specified limits.

5 *Value of liabilities in FSA returns*: This calculation is the same as the calculation in 4 above.

Defined benefit pension schemes

6 *Value of liabilities in the company accounts*: Accounting standards FRS 17 and IAS 19 specify that this calculation should adopt a discount rate that reflects the prevailing rate on (high quality) corporate bonds and that it should incorporate the best estimate of future cash flows, including full allowance for salary increases after the accounting date.

7 *Technical provisions*: This calculation arises under the Pensions Act 2004. Legislation requires that the assumptions must be prudent, but there is no requirement to include salary increases after the valuation date. The *discount rate* may reflect the investment returns on a range of asset classes, with the result that the *discount rate* may be higher or lower than the rate used in the accounting valuation.

8 *Transfer values*: This calculation is shortly to be the subject of a statutory minimum. The government's proposals indicate that this minimum should reflect best estimates of future events, rather than the "prudence" required for *technical provisions*. The *discount rate* should reflect the expected investment returns, having regard to the scheme's investment strategy. No allowance for future salary increases is required, reflecting the fact that *transfer values* arise, by definition, after the member has left employment.

9 *Statutory solvency valuation*: This calculation also arises under the Pensions Act 2004. Regulations require a calculation of the cost of buying out the scheme benefits with an insurer. The amounts charged by insurers will depend on market forces but, in keeping with the regulatory regime applicable to buy-out insurers, investment returns are likely to be no

higher than the yields on gilts coupled with a cautious estimate of the returns on reinvestment income. As with *transfer values*, no allowance for future salary increases is required.

10 *Funding valuation (or funding plan)*: This calculation arises when deciding how much needs to be invested in a pension scheme to meet the emerging benefits. In the case of a *recovery plan* required by statute if the scheme's assets fall short of the *technical provisions*, the assumptions must be "appropriate" for the scheme, rather than prudent. A *funding valuation* is typically also a requirement under the rules of a pension scheme. It is not usual for scheme rules to specify details such as whether to allow for future salary increases or the allowance to be made for investment returns.

SIMILARITIES AND DIFFERENCES BETWEEN THE CALCULATIONS

6.6 The foregoing descriptions highlight some similarities in the calculations that actuaries carry out. The descriptions also demonstrate that, for good reasons, there are also differences between the calculations:

- *Use of discounted cash flows*: As noted in paragraph 6.5, all the calculations are designed to derive a single monetary amount which equates to a stream of uncertain future cash flows, but only some of the calculations do so by expressly estimating the cash flows and then *discounting* them to the valuation date. The exceptions to this general rule are the *retrospective calculation* of life insurance liabilities under the FSA's *realistic peak* calculation and the major portion of the general insurance liabilities for accounting and regulatory purposes.

- *Prudence vs best estimate*: The regulations expressly require prudence or margins for adverse deviation to be included in the case of the *mathematical reserves* in life companies, the *technical provisions* for pension schemes and the provisions for general insurance. But for the *realistic value* of liabilities in life companies and *transfer values* from pension schemes, the regulations expressly require best estimates, as do the accounting standards for pension costs in company accounts (FRS 17 and IAS 19).

- *Discount rate*: The regulations for the *mathematical reserves* in life companies and for general insurance provisions impose upper limits on the *discount rate*. The accounting standards for pension costs require a specific rate to be used (no higher and no lower), based on bond returns at the accounting date. The regulations for pension scheme *technical provisions* and *transfer values* permit rates higher (or lower) than bond returns to be used, expressly permitting expected out-performance of equities over bonds to be allowed for.

- *Future salary increases*, *inflation and bonuses*: In life insurance calculations, no allowance is required for future terminal bonuses in the calculation of the *mathematical reserves*, but it is expressly required (either explicitly or implicitly) in the *realistic liability calculations* and *accounting values*.

  For pension schemes, future salary increases must be fully taken into account for the purposes of the *accounting value*, excluded for the purposes of (the statutory minimum for) *transfer values*, but are a matter for the decision makers of each scheme to decide for the purposes of the *technical provisions* and *funding values*.

6.7 For the reasons illustrated by the example calculations listed in paragraph 6.5 and the analysis in paragraph 6.6, the BAS has concluded that:

- there are many differences between the calculations used by life insurance actuaries, general insurance actuaries and pensions actuaries that arise from the different regulatory regimes; and
- it would be inappropriate for the Conceptual Framework to force (or attempt to force) a convergence between the different regulatory calculations, unless or until the regulations for the three fields converge.

VALUATION METHODS

6.8 Historically, actuaries (particularly in the field of pensions) have often used the term "valuation method" in a way that does not match the ordinary English use of the word. In normal parlance, two different "methods" of valuation would be intended to produce similar results. For example, when an unquoted business is valued for sale, it might be valued using *p/e ratios* and by *discounting estimated future cash flows*. The valuer uses two methods so that they can each act as a cross-check against the other. If the two results differ widely, the valuer will look for an explanation in order to narrow the gap.

[It is not necessary for readers to be familiar with the terms highlighted in italics in the paragraph above. The terms are included merely to identify the calculations for those who are familiar with the terminology.]

6.9 But the actuarial standard known as GN 26, *Pension Fund Terminology*, which the BAS adopted from the Profession, defines a number of different calculation "methods". It is clear from reading the definitions that these methods are not designed to reach the same, or similar, results: they are deliberately intended to be different. A more accurate label for these calculations would be *measures*, not *methods*.

6.10 For example, the *Current Unit Method* is a *measure* of the liabilities which covers past service, based on *current* salaries,[11] whilst the *Projected Unit Method* is a measure which covers those liabilities *plus* an allowance for projected future salaries at retirement. As a result, given the same data and the same assumptions, the *Projected Unit* calculation will produce a higher figure than the *Current Unit* calculation.[12] Properly stated, the *Current Unit* and *Projected Unit* calculations are different *measures* of liability, rather than different *methods* of calculating the same liability. The equivalent point applies to the other "methods" set out in GN 26.[13]

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[11] To avoid unnecessary complexity, the definition of the *Current Unit Method* adopted here is the definition from the first version of GN 26, published in 1996. The definition was modified in 1997 to reflect changes in legislation which altered the minimum benefits payable to members who leave service before retirement. But this change does not alter the conclusion stated above.

[12] It is possible to make a *Projected Unit* calculation using one set of assumptions and a *Current Unit* calculation using more conservative assumptions, with the result that the calculations converge. But, if the same level of conservatism (or optimism) is applied to the two calculations, the result under the *Current Unit* calculation is necessarily less than under the *Projected Unit* calculation unless the assumed increase in salaries falls short of the assumed increase in deferred pensions.

[13] The Pensions Act 2004 has followed the GN 26 nomenclature and refers also to "methods" rather than "measures" (which it requires the trustees, in agreement with the sponsoring employer, to determine).

VALUATION vs PLANNING

6.11 The calculations listed above all have a particular feature in common: they derive a single monetary amount which, at the effective date of the calculation ("the valuation date"), equates to a stream of cash flows payable on other dates.

6.12 The underlying real-world principle by which a single monetary amount can be linked or equated to a stream of cash flows is the economic activity of *investment* (and *disinvestment*) in which a sum of money is exchanged on a given date for a series of cash flows at later dates (and vice versa). In financial terminology, the calculation which converts (a stream of) cash flows at one or more date(s) to an equivalent figure at another (earlier) date is known as *discounting* (a term which appears in the examples above, but has not been explained until here).

6.13 Readers familiar with mathematical terminology will recognise *discounting* as an *operator* applied to a series of cash flows and to the dates associated with those cash flows to arrive at a single sum of money associated with another date. Mathematically speaking, the date to which the cash flows are discounted can be earlier than, later than, or during the time span of the other cash flows, although it is usual to talk about *accumulation*, rather than *discounting*, when the specified date is after the cash flows.

6.14 The examples above have the following further features in common:

a) in each of the examples, the cash flows are liabilities of the entity referred to in the headings (ie the life or general insurance company or the pension scheme); and

b) each calculation is performed in circumstances where the goal is to arrive at a result which will be applied to a transaction or in a formal document such as accounts or a regulatory return.

6.15 There is a second class of calculations which has a subtly different real-world interpretation and may, therefore, require different inputs, even though the mathematics is identical. In this second type of calculation:

a) the aim is to calculate the amount of the assets that the entity needs to hold in order to pay off the liabilities as and when they fall due; and

b) the calculation is performed in circumstances where the goal is to arrive at a provisional amount for *planning or target-setting purposes*, not a result which will be adopted in a transaction or in a formal document such as accounts or a regulatory return.

6.16 This second type of calculation applies, for example, to:

- funding assessments for pension schemes

- developing a bonus distribution strategy in a with-profit life fund (or, in traditional actuarial terminology, a control method for the release of surplus)

- reviewing the adequacy of general insurance premiums.

6.17 In purely *mathematical* terms, as noted in paragraph 6.15 above, there is no difference between this second class of calculations and the first class, which applies, for example, to:

- liability values for regulatory returns
- accounting values for statutory accounts
- transfer or surrender values paid to individuals
- appraisal values for the purchase or sale of a business.

6.18 The end result of the process in the first class of calculations is the adoption of an amount for the purposes of a transaction or a formal document. In ordinary English, this process is known as a *valuation.* In the second class of calculations, the end result is a provisional amount for the purposes of *planning*, *budgeting* or *target-setting*. Outside the actuarial environment, the processes of planning, targeting and budgeting are not typically known as *valuations*. Several commentators have, over a period of years, criticised the unusual way that actuaries have used the word.[14]

6.19 It may well be too late for the BAS to change the day-to-day use of the word "valuation" in the actuarial context, not least because it appears in many pension scheme trust deeds and other legal documents which cannot realistically be changed. But the BAS will endeavour to avoid using the term *valuation* where *planning*, *budgeting* or *target-setting* or some other term is more appropriate.

6.20 The distinction between *valuation* and *planning* is more than just a matter of semantics. The process of *planning* typically calls for different assumptions from a *valuation*. The following example illustrates this in some detail, reflecting the importance which the BAS attaches to a clear understanding of the point by those involved in setting actuarial assumptions for *planning* purposes. Other readers can continue reading at paragraph 6.21 without any loss of continuity.

EXAMPLE

Consider an entity that has a liability to pay 100 in ten years time. The entity wishes to set funds aside to meet the liability and is considering six investment strategies (below) for the funds. The entity now wishes to have an actuary calculate how much money should be set aside under each strategy. The six investment strategies are:

A purchasing a ***matching asset*** (ie a zero coupon bond)

B putting the money on deposit in an account which ***guarantees a rate of return of 3% pa*** (the guarantee applies to the reinvestment of interest earned as well as to the capital)

C putting the money in a ***safety deposit box***

D investing in ***equities***

E investing in ***non-matching bonds***

F putting the money on deposit in an instant access account ***offering a variable rate of return*** in line with other accounts on the market.

[14] The first was probably Professor John Kay, an eminent economist, addressing the Institute of Actuaries' discussion of *The Comparative Value of Pensions*, in October 1981.

The entity stresses to the actuary that it fully recognises that the strategies have significantly different levels of risk and that, if the fund is left untouched, some of the strategies will produce funds in ten years time that may be more than, or less than, the liability of 100. The question to the actuary is to calculate a ***central estimate*** of the amount which needs to be placed in the funds at the start of the ten years. The entity explains, for the avoidance of any doubt, that it uses "central estimate" to mean an amount that is just as likely to exceed 100 in ten years' time as it is to fall short.

Given this scenario, the following seven statements can be made, all of which are objectively true, save for statement 6, which depends for its validity on research:

1 The amount required under strategy A (purchasing a zero coupon risk free bond of ten years' duration) can be found by looking up the price of such a bond. If the asset does not exist in the open market, it can be constructed from bond-based derivatives. At current rates, the price of such a bond would be approximately 60. As the matching asset, the bond is guaranteed to meet the liability, so the calculation leads to a certain amount. In other words, there is only one answer, rather than a range from which to pick the central estimate.

2 The price calculated under statement 1 above is also the "market value" of the liability. From the perspective of the issuer of the bond, it is a liability identical in nature to the entity's.

3 The amount required under strategy B (a deposit account paying a guaranteed return of 3% pa) can be calculated using a simple formula, which gives an answer of 74. Because the return on the fund is guaranteed (including the return on reinvested interest), the calculation leads, once again, to a single, certain amount.

4 The amount required under strategy C (a safety deposit box) is 100 and the figure of 100 is, once again, a certain amount.

5 Strategies D, E and F (equities, non-matching bonds and a deposit account with an uncertain rate of return) are not capable of generating a certain answer. The rate of return on each of these assets is uncertain. (Pedantically, the uncertainty in relation to the non-matching bonds attaches to the return on reinvesting the bond coupons and the capital amount, if it is invested short, or the price at which the bond can be sold if it is invested long.)

   In order to make the required calculation, the actuary will have to consider a range of possible returns and exercise judgment about the various probabilities in order to derive the central estimate.

6 Based on extensive research, it is well-known and widely accepted that investors expect equities to outperform bonds (and deposit accounts) over the long term. The term "equity risk premium" is used to refer to the expected out-performance of equities over a risk-free investment.

7 If the actuary reflects this expected equity out-performance in the calculations, it follows mathematically that the amount required under investment strategy D (equities) is less than the amount required under strategies E and F (non-matching bonds and a deposit account with an uncertain rate of return).

At this point in the analysis, views currently differ within the financial community:

8a) ***On one view of the world***, it is appropriate to take account of the expected out-performance and so the amount calculated as the central estimate under strategy D will be less than under strategies E and F (as implied by statement 7 above).

The calculation of the figure in D depends on how large one believes the equity risk premium to be, but it will be materially different from the results under strategies E and F for any generally accepted estimate of the equity risk premium.

8b) ***The opposing view of the world*** says that it is wrong to allow for the expected out-performance. This view is typically expressed using wording which warns against "taking credit in advance" for the expected out-performance, so as to highlight the fact that the expected out-performance has not materialised yet.

On this view, the calculations in D, E and F must all be made adopting the same investment expectations as in A (the matching asset strategy), leading to the same result for D, E and F as was found in A. In other words, ***this view of the world produces identical answers for four out of the six strategies***, the exceptions being B (a fixed rate deposit account, for which the answer is 74) and C (a safety deposit box, for which the answer is 100).

Note also that, by virtue of statement 2 above, in this view of the world, the answer that applies to four of the strategies is the market value.

The approach implied by the view in 8(b), ie not taking any credit for the expected out-performance, plainly incorporates a measure of prudence. If the entity had asked the actuary for a *cautious* estimate, this would be one possible level of caution. But the example expressly says that the entity did *not* ask for a cautious estimate. The entity asked for the actuary's *central* estimate. That being so, we need to think carefully about the applicability of the "expected out-performance" that view (b) seeks to ignore.

As a matter of language (not judgment), the "expected out-performance" referred to in 8(b) is simply a shorthand for "the extent to which the central estimate of the performance of equities exceeds the central estimate of the performance of the matching asset." Put like that, it should be apparent that, as a matter of logic, one cannot calculate the *central estimate* of the outturn under an equity investment strategy if one ignores the central estimate of expected equity performance.

To put the point the other way around, the view expressed in 8(b) is a well-founded and defensible view of the world, but it is a view that is relevant to actuarial calculations in which the question to be answered calls for a degree of *conservatism* – specifically, a degree of conservatism compatible with not anticipating the equity risk premium until it has actually been earned.

An example of an even more cautious calculation is one in which one takes no credit in advance for *any* investment returns until they have been earned. In other words, an answer of 100. Most actuaries would regard this as over-cautious, but even this result is not *guaranteed* to be cautious enough to cope with extreme downturns in the equity market.

Of course, these are not the only two possible degrees of caution. There is a continuous range of caution from only fractionally more cautious than the central estimate through to extremes of caution in which allowance is made for the assets to be all but wiped out.

6.21 The example above illustrates that, if the goal of the actuary's calculation is to arrive at a cautious estimate of the amount needed to fund a liability, one way to allow for this is to disregard some – or even all – of the expected return on the investments. A well-recognised degree of caution is to allow for

the return on the risk-free asset, but no higher than that. But this is not a guarantee, unless the funds are actually held in the risk-free asset.

6.22 This particular level of caution is often expressed as though it were an objective truth that "the value of a liability does not depend on the way it is funded." But this statement is true only if the "value" in question is "market value." If any of the other values mentioned elsewhere in this paper are to be calculated (eg solvency value, accounting value, transfer value etc), the statement may not be true depending on which of the alternative values is called for.

6.23 Specifically, as the example above demonstrates, the assertion is definitely *not* true if the amount to be calculated is a planning estimate of the amount needed to fund the liability, for example the *central estimate*. Changing the assets from bonds to equities, for example, will definitely change the *central estimate* of the amount needed.

6.24 In conclusion, and for the reasons set out in paragraphs 6.11-6.23, the BAS is of the opinion that:

- the distinction between *valuation* and *planning* is more than just a matter of semantics: the aim of a *valuation* is to crystallise an amount which can be applied to a transaction or recorded in a formal document, whereas the aim of *planning* is to arrive at a provisional amount for *budgeting* or *target-setting purposes*; and

- *planning* may well (and typically does) call for different assumptions from a *valuation*.

6.25 Furthermore, for the reasons set out in the example directly above paragraph 6.21, the BAS is also of the opinion that:

- whether or not an entity's assets will be sufficient to meet the entity's liabilities depends, as a matter of logic, on how the assets are invested and how the investments perform; and

- if some or all of the assets are invested in equities, a calculation of the *central estimate* of the amount needed to meet the liabilities cannot, as a matter of logic, be made while ignoring the central estimate of expected equity performance.

FINANCIAL MANAGEMENT IN INSURANCE AND PENSIONS

6.26 Pensions and life insurance have much in common. They both involve arrangements to make payments contingent on the survivorship of the recipient. Actuaries operating in each of these spheres apparently approach their work with two radically different mindsets. But, on closer examination, it may not be the mindsets that are different so much as the underlying regulatory regimes.

6.27 Historically, legislators and policymakers have deemed that life insurance companies should not become insolvent. Regulation has been created which require life insurers to operate in a manner which is demonstrably solvent, with safety margins built in on top – all designed to reduce the risk of insolvency to a level which society (or the regulator on society's behalf) deems acceptable. If the safety margins are breached, the regulators take action. In extreme cases, the life insurer will be forced to stop writing business, along with various other consequences. The safety margins vary

over time, but the basic principle that safety margins exist and should not be breached has been in place for many decades.

6.28 The position for pension solvency is fundamentally different. The story is changing over time and the current position has been in place only since the coming into force of the Pensions Act 2004. But as matters stand at the moment, and in the past, there has never been a solvency level or safety margin below which schemes were not permitted to fall and still be allowed to remain in existence. The current legislation defines "solvency" at a level that very few schemes meet or aspire to (the *buy-out* cost – see paragraph 6.5, example 9). The legislation allows schemes to continue to operate well below that level. A lower, scheme-specific target level of funding is set (equal to the *technical provisions*), but schemes are permitted to continue operating even with assets less than the *technical provisions*, so long as there is a *recovery plan* to eliminate the shortfall over time. The *recovery plan* must be acceptable to the statutory regulator who (in keeping with the legislation) will typically allow several years to make good a deficit.

6.29 It is not necessary, for this analysis, to go into each of the historical milestones prior to the current position, save to say that the starting point, some 50 years ago, was that schemes were permitted unlimited deficits, with no requirement to eliminate them. The policy objective in the early days of pension schemes was solely to put an *upper* bound on the amounts being put into pension schemes, because the government was concerned that the tax privileges of pension schemes should not be abused. (That is still the case, but not the dominant financial issue in the way that it has been at various times in the past.)

6.30 The story from then until now has been one of progressive implementation of minimum funding levels, in an upward direction, with the result that today's legislation is the toughest there has been so far. The legislation has never yet gone so far as to make the existence of a deficit a scheme-stopping moment in the way that legislation has for insurance.

6.31 This distinction has been crucial in the financial management of life insurance and pension schemes. So long as life insurance managers are necessarily preoccupied with not allowing the assets to fall below a target level (essentially, solvency plus a safety margin), whilst the managers of pension schemes are free to let the assets fluctuate above and below the target level, or (as in the past) are not set any target level at all, the management of these two financial entities is bound to be different. If there weren't two different management mindsets, then one or other piece of legislation would (apparently) be being ignored. And, if there weren't different actuarial techniques reflecting the different management mindsets, actuaries would (apparently) have failed to address the legislative regimes. Neither of these has happened.

6.32 Pensions regulation, with its tolerance of funding shortfalls, directs scheme trustees, employers and their actuaries towards calculations in the general nature of a funding *plan*. For current regulatory purposes, the questions put to actuaries, and their answers, must be more cautious than a central estimate, because the Act calls for prudence. But the regulator's Codes of Practice make it clear that the required level of prudence does not rule out

assumptions which incorporate a measure of equity risk premium.[15] In terms of the two views described in Statements 8(a) and 8(b) of the Example above, some allowance for the expected out-performance of equities over the risk-free asset is permitted by the regulator – meaning that the view of the world described in Statement 8(b) is not required for regulatory solvency in pensions, even though that view, or something close to it, is required in life insurance.

6.33 For the reasons set out in paragraphs 6.26-6.32, the BAS is of the view that

- the apparently different mindsets of actuaries working in insurance and pensions arise from the different regulatory regimes – specifically, the requirement for solvency in one regime and the tolerance of funding shortfalls in the other; and accordingly that

- the focus by pension scheme actuaries on *targeting* as a major tool of financial management, while insurance actuaries focus on *valuation*, is a consequence of, and in keeping with, those regulatory regimes.

For the reasons set out in paragraphs 6.5-6.6, the BAS has concluded that:

- there are many differences between the calculations used by life insurance actuaries, general insurance actuaries and pensions actuaries that arise from the different regulatory regimes; and

- it would be inappropriate for the Conceptual Framework to force (or attempt to force) a convergence between the different regulatory calculations, unless or until the regulations for the three fields converge.

For the reasons set out in paragraphs 6.11-6.23, the BAS is of the opinion that:

- the distinction between *valuation* and *planning* is more than just a matter of semantics: the aim of a *valuation* is to crystallise an amount which can be applied to a transaction or recorded in a formal document, whereas the aim of a *plan* is to arrive at a provisional amount for *budgeting* or *target-setting purposes*; and

- a *planning* exercise may well (and typically does) call for different assumptions from a *valuation*.

Furthermore, for the reasons set out in the example below paragraph 6.20, the BAS is also of the opinion that:

- whether or not an entity's assets will be sufficient to meet the entity's liabilities depends, as a matter of logic, on how the assets are invested and how the investments perform; and

- if some or all of the assets are invested in equities, a calculation of the *central estimate* of the amount needed to meet the liabilities cannot, as a matter of logic, be made while ignoring the central estimate of expected equity performance.

[15] As defined in the example which some readers may have elected not to read, the term "equity risk premium" refers to the expected out-performance of equities over a risk-free investment.

For the reasons set out in paragraphs 6.26-6.32, the BAS is of the view that

- the apparently different mindsets of actuaries working in insurance and pensions arise from the different regulatory regimes – specifically, the requirement for solvency in one regime and the tolerance of funding shortfalls in the other; and accordingly that

- the focus by pension scheme actuaries on *targeting* as a major tool of financial management, while insurance actuaries focus on *valuation*, is a consequence of, and in keeping with, those regulatory regimes.

The BAS regards this section of the Consultation Paper as setting out matters of current and historical fact, together with logical analysis based on those facts, rather than matters of judgment or policy. The BAS would welcome respondents' feedback on the material set out in this section if respondents believe any of it to be ill-founded, but asks respondents to take note that the implications for the Conceptual Framework of this material follow in Section 8, which therefore provides a more effective opportunity for making comments.

7 RISK AND UNCERTAINTY

THE NATURE OF RISK AND UNCERTAINTY

7.1 In ordinary English usage, the term *risk* typically refers to the possibility of an adverse or unfavourable outcome. But in finance and economics, *risk* usually refers to both favourable and unfavourable outcomes, with the adjectives *upside* and *downside* used to distinguish one from the other.

7.2 Some economists and actuaries go further and draw a distinction between *risk* and *uncertainty*, using the following (or similar) classifications:[16]

1 *A priori (or mathematically derivable) probabilities*: these include, for example, the chances of a particular outcome from tossing an unbiased coin, or selecting particular cards from a pack of playing cards. These results can be calculated without needing to observe coin-tossing or card-dealing.

2 *Statistical (or empirically derivable) probabilities*: these cover outcomes for which the probabilities can be derived from observing past experience and drawing statistical inferences. Obvious examples include human features, such as the chance that a randomly selected male will be above a certain height or have eyes of a particular colour.

3 *Estimates for which there is no basis on which to assign probabilities*: these cover outcomes for which there is no past experience or for which past experience is not a plausible guide to the future. So, for example, the chance of finding life on Mars has no prior statistics to guide us. The chance that a new invention will need to be recalled from sale on safety grounds could be estimated by collecting statistics from past inventions, but if the product is unprecedented (the first mobile phone, for example) statistics from previous inventions would not provide a meaningful guide.

7.3 The third category (no basis on which to assign probabilities) is sometimes called *uncertainty* to distinguish it from the first two categories (mathematically and empirically derived probabilities) which are called *risks*. This distinction between *risk* (quantifiable) and *uncertainty* (unquantifiable) tends to appear more in academic literature than in day-to-day business terminology. The significance of the distinction, and the implications of failing to draw the distinction, are discussed in paragraphs 7.24-7.37.

7.4 It is easy to identify outcomes that fall within the first category (those with a mathematically derivable probability), but they rarely occur in actuarial work or in business generally, so they have only limited relevance.

7.5 Distinguishing between the second and third categories can be much more difficult. For example, when a lawyer tells a client that there is a 40% chance of winning a case, it is clearly not an opinion based on extensive collection and analysis of data but is it, nevertheless, an empirically derived probability (albeit an approximate one) based on years of trial experience, or is it a wholly subjective estimate with no underlying basis in probability at all and perhaps not fit to be quantified?

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[16] The origin of this classification is usually attributed to *Risk, Uncertainty, and Profit*, by Frank H Knight, published in 1921.

7.6 In the actuarial world, mortality probabilities could, for many years, be said to fall into the second category (plausibly derived from empirical evidence). But that didn't extend to times of World War or potential medical epidemics, such as AIDS (which became an epidemic in some countries) or vCJD (which has failed, so far, to reach epidemic proportions).

7.7 Even without epidemics to throw the statistics into disarray, there is now real uncertainty about the future course of human longevity in our society. Whether future longevity outcomes have actually jumped from the second category (statistically quantifiable) to the third (unquantifiable estimates) is a debatable point, but it is at least a possibility – a possibility that becomes more plausible the younger the age group under consideration (see also paragraph 7.21).

SCENARIO GENERATORS

7.8 Paragraph 6.12 of this paper described briefly the *discounting* calculation by which a stream of cash flows payable on various dates is equated to a single monetary amount on a specified date ("the valuation date").

7.9 Before the emergence of computers as day-to-day tools in business and finance, the calculation described above would typically be carried out once using one set of assumptions for the variables that were uncertain, for example the expected rate of return on investments. In the case of life insurance and pensions, a beneficiary's life span would be a crucial determinant of when, or for how long, the beneficiary received payment(s).

7.10 With the advent of computers, an alternative approach became readily available. Instead of making a single set of assumptions, it became feasible to run multiple calculations of future possible scenarios. By running many scenarios (usually thousands) it is possible to generate a distribution of outcomes which shows both a range of (reasonable) possibilities and, within that range, the frequency with which specific outcomes arise. The software – known as a *scenario generator* – can show how likely certain outcomes are, identifying, for example, the *central estimate* and any other specific points in the range, such as the *upper quartile* (the outcome which exceeds all but one quarter of possible outcomes).

7.11 This type of calculation, based on multiple scenario generation, is known as *stochastic*. The alternative, a single calculation based on a single set of assumptions, is known as *deterministic*.

7.12 It is sometimes thought that the use of scenario generators somehow removes the reliance on assumptions, ie that the scenario generators create every conceivable future outcome and thereby produce a judgment-free range of outcomes and probabilities. That is not correct. To be of use, the scenario generators adopt equations or relationships which the creator of the *scenario generator* believes underpins the environment being modelled, for example the economy or the determinants of future mortality, as discussed immediately below. Some scenario generators are built with the flexibility to allow users to select which relationships to adopt.

Economic scenario generators

7.13 *Economic scenario generators* are the scenario generators most frequently used in actuarial work. They can be used in one of two ways. One use is to calculate the *market consistent value* of a liability, ie the amount at which a

liability for which there is no market might hypothetically be traded if a market in the liability did exist. The second use of economic scenario generators is for financial *planning*.

7.14 The assumptions underpinning an economic scenario generator must be adjusted (or *calibrated*) to reflect the application to which the scenario generator is put. When economic scenario generators are used in (market consistent) *valuations*, the models are first calibrated so as to recreate market prices for traded products, before being used to value un-traded products. This means that the accuracy of the calibrations can be tested against the market. But when economic scenario generators are calibrated for use as a financial *planning* tool, ie for managing risks in the context of unknown future outcomes, the correctness of the calibrations cannot be tested, as such.

7.15 In the world of pensions and insurance, these two applications are known as *market consistent* (or *risk neutral*) and *real world*. In the language of Section 6 of this paper, perhaps the term *planning* would be preferable to *real world* – not only to suit the distinction drawn in this paper, but because the industry's own terminology seems to suggest that market consistent valuations do not reflect the real world, an impression which is very far from one which the creators of economic scenario generators wish to convey.

7.16 As noted in paragraph 6.20, and demonstrated in the example beneath that paragraph, *planning* and *valuation* potentially require different assumptions from each other. As noted above, the same is true for the *planning* and (market consistent) *valuation* applications to which economic scenario generators are put. Paradoxically, it seems to be recognised by all actuaries, without any dispute, that different calibrations (ie assumptions) are required for the two applications of economic scenario generators. But in the context of *deterministic* models, the same proposition has been hotly disputed by those who have promoted the view of the world described in statement 8(b) of the example beneath paragraph 6.20.

7.17 One particularly critical factor for economic scenario generators when used for *real world/planning* applications is the extent to which the model includes an assumption that the equity market exhibits *mean reversion*, ie that valuation indicators (for example, the price/earnings ratio) tend to return over time to a long-run average. An economic scenario generator which includes the assumption of mean reversion is more likely to predict a recovery after a major stock market collapse (and vice versa) than one which doesn't include a mean reversion assumption. The economic scenario generators in popular use generally give users a choice whether (and to what extent) to apply an assumption of mean reversion, but some models do not allow for mean reversion at all.

7.18 A number of firms, including several of the actuarial consulting firms, have built economic scenario generators for actuarial purposes. In conversation with the BAS, some of the creators of economic scenario generators on the market have suggested that, when used for *planning* (or *real world*) purposes, the models have the potential to produce results that are significantly different from each other, most especially when the economy is away from normal. (One can always debate what is "normal". But, in this context, by way of example, the stock market collapse in 2002-03 had been projected by many leading actuarial firms with a probability of less than 3% at the end of 1999. The actual collapse doesn't mean that the probability was wrongly assessed, but it does indicate that the collapse was "abnormal" so far as the model was concerned.)

Longevity scenario generators

7.19 Economic scenarios are not, of course, the only uncertainty inherent in *valuation* and *planning*. A criticism of pension actuaries identified by the Value Working Group[17] is that actuaries' probability distributions in relation to pension liabilities usually encompass only some of the uncertainties, most notably the uncertainty relating to the investment return, but not all the uncertainties. For example, the uncertainty surrounding longevity increases is not usually addressed.

7.20 The potentially key difference between economic scenario generators and longevity scenario generators lies in the relationships that underpin the models. Until only a few years ago, it was widely believed that past longevity statistics, together with an extrapolation of improvement trends, generally provided a sound basis for projecting future longevity (subject to the intermittent uncertainties created by diseases such as AIDS and vCJD – see paragraph 7.6).

7.21 But evidence from more recent years shows that there has been an underlying improvement across the population as a whole and across specific cohorts of the population (most notably for people born around the 1930s). There is no real certainty about the reasons for this improvement or the scale of future improvements. The improvements could even go into reverse. One view that has been expressed is that there is no way "actuaries – or anyone else – [can] know whether the population will dine itself to death or exercise its right to life?"[18]

7.22 The BAS is currently conducting a review of the mortality assumptions used in actuarial calculations. There are models in existence which some actuaries describe, to a greater or lesser extent, as mortality scenario generators. But the BAS has been told that they produce materially different results from each other.

7.23 The key questions at this point are (1) whether there is sufficient information from which to develop the mortality equivalent of the relationships which drive economic models and (2) whether the resulting projections will be sufficiently narrow that mortality projections can be made with the level of confidence that prevailed in past times. The insurance and pensions markets (not to mention the new pensions buy-out companies) have sufficient financial capital and sufficient incentive to solve these problems if they are soluble, but they have not done so yet.

UNDERSTANDING PROBABILITIES

7.24 As the discussion above shows, actuaries make considerable use of probabilities in their work. Increasingly, there is a demand for actuaries to make the probabilities more transparent, a demand which many actuaries have sought to satisfy. But there is a real question mark over the comprehensibility of the probabilities that users are presented with.

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[17] The Value Working Group was established by the BAS "to consider the concept and the competing philosophies of value." More details about the Value Working Group and its work product are available on the BAS pages of the FRC website.

[18] *This Mortal Coil is No Easy Thing to Measure*, Financial Times, 29 February 2004, written by Tom Ross, a member of the BAS, writing in his then capacity as President of the Faculty of Actuaries.

7.25 This is not at all a matter of the user's intelligence – most immediate users of actuarial reports (insurance company directors and pension scheme managers and trustees) are a self-selecting group of intelligent individuals, willing to devote time and energy to grapple with the complexities – it is, in the view of the BAS, largely a matter of probabilistic information being presented in a way that has been prone to confuse users.

7.26 Consider the following examples of probabilities:

- It is well-known that, when actuaries refer to a mortality probability of 1%, they mean that, from a population sample of 100 people, it is expected that one person, chosen at random, will fail to survive over the time period in question.

- But when actuaries refer to a probability of 1% in relation to an economic outturn (for example, a collapse in equity prices), they do not mean the equity investments of one randomly chosen pension scheme or life company out of 100. In this context, a probability of 1% means one *economic scenario* out of 100 such scenarios. If that one scenario in a hundred comes about, *all* pension schemes and life companies with equity investments in their portfolio will be affected.

- What meaning should one attach to a probability of 1% associated with future mortality estimates? It would presumably mean, once again, one *scenario* out of 100, not one person, one pension scheme or one life company out of 100. But what is a "scenario" in this context? Presumably the different scenarios imply varying degrees of medical advances, societal changes and/or life-style choices. In the absence of any historical statistics to guide the actuary – because we now know that past experience in mortality is not currently a guide to the future – where would the underlying probabilities come from?

7.27 Distinguishing between individuals (or individual entities) and scenarios addresses only part of the communication issue, as the following further examples illustrate:

- *Doctors:* When a doctor says an operation has a 90% chance of curing the patient and a 10% chance of killing him, does every patient go into theatre with the same 90:10 odds, or do the chances depend on the severity of the disease, or perhaps the quality of the doctor? Can the severity of the disease be identified in advance, or does it remain hidden from view? Can the skill of the doctor be known in advance, or do the doctors who are perceived (rightly or wrongly) as the best get the most difficult patients and, therefore, have poor statistics?

  In short, just because the statistics indicate a 10% probability of death across all operations of the type in question, it does not follow that the probability of death for an individual patient is actually 10%.

- *Lawyers:* Returning to the example in paragraph 7.5 of a lawyer who tells a client that there is a 40% chance of winning a particular case, what does that mean? Is the lawyer saying that, if the same case was run through 100 trials, the client would win 40 of them? Does the lawyer mean that 40% of judges (or juries in a criminal trial) will go one way and 60% will go the other? And is that dependent on the choice of advocate? Or do the probabilities depend on how likely the witnesses are to be believed?

So, is this 40 advocates in 100, 40 judges/juries in 100 – or perhaps 40 scenarios in 100, where each scenario involves re-running the trial to see how often the advocates, witnesses, judges and/or juries combine to reach each particular outcome, comparable to re-playing a football match between the same clubs 100 times to see how the results varied.

- *The Prosecutor's Fallacy*: When a DNA sample is found at a crime scene and it matches a particular person's DNA, one often hears statistical evidence to the effect that the DNA match is one in a million (say). This statement is then often mis-repeated or misinterpreted as "the chance of anyone else having this DNA match is one in a million." In other words, the statistical inference is made that there is only a one in a million chance that the defendant is innocent.

  In a population of 60 million people (which is approximately the UK's population), a DNA sample having a match of one in a million is likely to be found in 60 people, of whom 59 are (presumably) innocent. If the DNA sample is the *only* evidence available – perhaps because the suspect was found by matching the sample to a database – the probability of the suspect's *innocence* is 59/60^{ths} (ie more than 98%).

  This particular mistake was identified 20 years ago[19] and convictions have been overturned on account of the misleading presentation of evidence. But the mistaken statistical inference has continued in the presentations made by prosecutors using non-DNA statistics.

  The BAS regards it as unlikely that an actuary or other statistician would commit such a statistical fallacy. The critical point is that *users* of actuarial work may read a correct statistical statement and draw the wrong inference from it.

7.28 In everyday usage, probabilities are applied in two different ways:

a) The first is where a probability is applied to a large population, for example to estimate the likely number of car accidents over a given period.

b) The second is where a probability is applied only to a particular member of the population, for example to make a statement about the likelihood that an individual child will grow to be taller than six foot tall.

7.29 If the probabilities being applied are reliable, there is a strong chance that the estimate in the first application will be close to the actual outturn. The larger the population being looked at, the more likely it is that the estimate will prove to be accurate. So, for example, if an unbiased coin is tossed repeatedly, the greater the number of tosses, the more likely it is that the results will be split 50:50 between heads and tails.

7.30 But, in the second case, the given member of the population can have only one outcome. A particular child will either grow taller than 6 feet or not.

7.31 Actuarial work makes use of probabilities applied in both ways described above. The first way (applying probabilities to a large population), is used

[19] Famously described in an article, *Interpretation of Statistical Evidence in Criminal Trials: The Prosecutor's Fallacy and the Defense Attorney's Fallacy*, by William C. Thompson and Edward L. Schumann, 1987.

heavily, for example in estimating the number of payments to be made to beneficiaries at different future dates. (The amounts paid to beneficiaries may also be estimated probabilistically, but that is not always the case, for example if the benefit is a fixed sum of money specified in a trust or contract.)

7.32 The second way of applying probabilities (to a particular member of the population) arises when planning for the future, but not in a *valuation*. For example, the probability that a pension scheme sponsor will become insolvent is not a factor that should be applied in a calculation to estimate the *value* that can be assigned to the stream of future contributions. Insolvency of the scheme sponsor is a specific scenario that may need to be tested to determine how the pension scheme will fare if future contributions are terminated (see *stress-testing* in paragraphs 8.21 and 8.48).

7.33 The scenario of a stock market crash is one that can also be examined. By using a *stochastic* process (see paragraph 7.11 above), the range of potential outcomes can be examined from market boom to market collapse, assigning probabilities to the outcomes. As recent history has shown in the field of pensions, a scenario cannot safely be dismissed merely because it has a low probability of occurrence. For example, there may be only a 5% chance, say, of a sharp fall in the stock market in a particular year. But even though this means that in 19 years out of 20, such a fall is estimated not to occur, the consequences in a year that it does occur can be catastrophic.

7.34 When probabilities are applied in the second way, more complex questions arise about the ability to check whether a probability was assessed reliably or not. If the probability of rain on a particular date was derived from information which included specific evidence collected in the days immediately prior to the date in question, the exercise cannot be replicated. The best that one can do is test the weather forecasting *system* by trying it out on a large number of dates and seeing how reliable the system is.

7.35 Likewise for stock market crashes: a run of 30 years without a crash – or two successive years with a crash – does not invalidate a probability estimate of once in 20 years.

7.36 These examples demonstrate the importance of explaining:

a) what a particular probability relates to (individuals, surgical operations, scenarios, etc);

b) whether the probability is based on an objective analysis or on subjective estimates;

c) the nature of any data on which the probability is based, for example past evidence of actual events, and how directly comparable the past events are to the events now under consideration; and

d) the correct inferences that may be drawn from a probabilistic statement.

7.37 The purpose of the foregoing remarks is not to suggest that the difficulties in presenting probabilities are so great that actuaries and the BAS should not try to overcome them. Advances follow from pushing at the boundaries. But the challenges are significant and care may be needed to distinguish between:

a) the level of complexity that actuaries can present to users; this must be an individual judgment tailored to the individual users and their statistical proficiency; and

b) the complexity of the analysis that actuaries can carry out for themselves and/or present to technically proficient financial regulators so that those regulators *themselves* can review the results.

Actuarial work makes considerable use of probabilities, but:

- for the reasons set out in paragraphs 7.1-7.7 above, the BAS has concluded that not all matters of uncertainty are susceptible to probabilistic analysis;

- in particular, for the reasons set out in paragraphs 7.6-7.7 and paragraphs 7.19-7.23, the BAS is looking into whether future mortality rates are, currently, capable of probabilistic analysis (the BAS is currently engaged in further extensive practical research on this topic outside the scope of the Framework Project[20]);

- as discussed in paragraphs 7.8-7.18, *stochastic* models (using *scenario generators*) provide a mechanism for those circumstances where probabilistic analysis is possible; the results of a *stochastic* calculation can vary – potentially significantly – according to the *assumptions* applied in the scenario generator; some assumptions are implicit in the software, rather than capable of selection by the user; and

- for the reasons set out in paragraphs 7.24-7.37, the BAS is of the view that, when probabilistic estimates are included in information presented to users of actuarial information, the information – and the interpretation which can be placed upon the information – needs to be presented with great care if it is to be understood properly.

The BAS regards this section of the Consultation Paper as setting out matters of current and historical fact, together with logical analysis based on those facts, rather than matters of judgment or policy. The BAS would welcome respondents' feedback on the material set out in this section if respondents believe any of it to be ill-founded, but asks respondents to take note that the implications for the Conceptual Framework of this material follow in Section 8, which therefore provides a more effective opportunity for making comments on matters of policy.

[20] This work on mortality is ongoing and will continue in parallel with this consultation. Up-to-date details of the work can be found on the BAS's website, for example in the monthly Activity Reports.

8 APPLYING THE CONCEPTS TO STANDARDS

INTRODUCTION

8.1 Sections 6 and 7 of this paper discussed various technical issues surrounding matters of quantification and risk. The Conceptual Framework will need to bring these issues together in a manner that is consistent with the objectives and characteristics of BAS standards (see Section 4 for proposals regarding the objectives and characteristics). The BAS's current thinking is that the Conceptual Framework will adopt the ideas set out below.

GENERAL PRINCIPLES

8.2 The following general principles will apply to the Conceptual Framework:

1 *Liabilities:* The Conceptual Framework (and the standards that follow) will recognise different approaches to valuation and planning for different contexts. This is because the range of actuarial calculations is too diverse to fit within one single approach. The reasons underlying this conclusion are discussed more fully in Section 6 of this paper.

The proposal to recognise a range of valuation approaches does not place actuarial work in a special position. Multiple valuation approaches and philosophies exist in other disciplines also. Economics, accountancy and finance between them recognise, for example, *value in use*, *value in exchange*, *book value*, *fair value*, *net realisable value* and several other measures.

2 *Assets*: The general principle will be that *existing* assets are to be taken at *market value* (or an estimate of the likely *value in exchange* in the absence of a market), unless otherwise required by the entity's regulator or by a BAS standard or otherwise stated and justified in the report on the actuarial work.

In those cases where it is part of the actuarial calculation to take into account assets which are not due to come into existence until some future date (for example future premiums to an insurance company or future contributions to a pension scheme), the calculation of the assets should follow the *quantification principles* set out below in paragraphs 8.3-8.30.

Where there are assets which are not owned by the entity, but which have been contingently assigned to the entity (for example in the context of regulations under the Pensions Act 2004), these contingent assets would normally be valued in the same way as *existing assets*, not *future assets*. The valuation principle here is by reference to existence, not ownership.

3 *Risk*: The Conceptual Framework (and the standards that follow) will set out principles on how to inform management about risk, what to inform them of and, potentially, when or how often to inform them. It is outside the scope of the BAS to set standards for managing risk. Management of risk is for managers of the entity.

4 *Work addressed by other regulators*: The FSA and TPR have issued a number of statements relevant to actuarial valuations and to risk. Sometimes these

statements specify the calculation methodology or assumptions (or a range of permitted methodologies or assumptions). But on other occasions, the regulators' statements might simply say that the entity is to follow BAS standards and/or recognised actuarial practice.[21]

Where required, BAS standards will set out how to implement the rules contained in those statements. Some standards will be specific to a particular field of work and some will be generic to all actuarial work within the scope of the framework (ie Categories A and B plus any specific areas of Categories C and D designated by BAS as being within scope – see paragraph 3.9 for the Category definitions).

CONCEPTS AND PRINCIPLES RELATING TO ACTUARIAL QUANTIFICATION

8.3 The calculations that arise in actuarial work comprise, and are defined by, the following ingredients:

- the *nature and objective* of the calculation;
- the *data* provided;
- the *assumptions* made;
- the *cash flows* allowed for; and
- the *risks* taken into consideration.

8.4 Each of these ingredients is described in more detail in the paragraphs below.

Nature and objective

8.5 For calculations which fall within Categories A or B, the nature or the objective of the calculations is likely to be specified in the regulations or in the legal instrument which gave rise to the work in the first place. (Failure to identify, in the governing legal document, the nature or the scope of the calculation may render the work too vague to perform.)

8.6 For calculations which fall within Category C or D *and* within the scope of BAS standards (limited to specific classes of work which the BAS has determined should fall within the scope of standards), the definition or description used by the BAS to identify the class of work will include the nature or objective of the calculations.

8.7 There may be more than one *methodology* which can be used to achieve a given objective. For example, the FSA permits the *realistic value of liabilities* of a life insurance company to be calculated using either a *prospective calculation*, in which estimated cash flows are *discounted* back to the valuation date, or a *retrospective calculation* (see paragraph 6.5(2) above).

8.8 There may also be more than one calculation *measure* which can be used to achieve a given objective. For example, TPR permits the calculation of the *technical provisions* of a pension scheme to use a variety of different measures, including the *current unit* and *projected unit* measures as defined in the current actuarial standard known as GN 26.

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[21] The current wording in the FSA Handbook refers to standards set by the Institute of Actuaries and the Faculty of Actuaries and to "generally accepted actuarial practice."

Data

8.9 In an ideal world, the data underpinning actuarial work (for example, the employment histories of pension scheme members) will always be available in precisely the form needed for the intended calculations and will be complete and accurate. In practice, that is not always the case. Sometimes, it may be necessary to form a view whether the data is suitable for the proposed calculations and, on occasion, to adjust the quantification methodology to allow for limitations in the available data.

8.10 Alternatively, or in addition, a margin may need to be incorporated within the quantification process, within the results, or within the *range* of possible results to avoid a misleading presentation of the entity's financial position.

Assumptions

8.11 As alluded to elsewhere in this paper, particularly in Sections 6 and 7, actuarial calculations almost invariably depend on one or more assumptions about the course of future events. Commonly encountered examples relate to the longevity of beneficiaries, the return earned on investments, price or salary inflation and several other economic and demographic factors.

8.12 For some calculations, the entity's own regulator may impose specific constraints or limits on the permitted range of assumptions. These constraints may be expressed qualitatively, for example a requirement for *prudence*, or quantitatively, for example a *best estimate*. Alternatively, the constraints may be expressed according to a specific rule or formula. For example, in the calculation of the *mathematical (liability) reserves* for life insurance (see paragraph 6.5(1) above), the FSA has set a specific formula for the maximum permitted figure for the assumption relating to investment returns.

Cash flows

8.13 The cash flows adopted in actuarial calculations are typically derived from a combination of underlying facts and assumptions about those facts. So, for example, the cash flows paid out to beneficiaries of a pension scheme depend on a combination of the scheme rules, factual data regarding the scheme membership and assumptions regarding the future course of events relating to those beneficiaries.

8.14 But there are circumstances in which the cash flows cannot be determined by facts and assumptions alone. For example, where a pension scheme or an insurer has a longstanding practice of paying benefits in excess of the contractual minimum, the decision whether to estimate the cash flows by reference to the contractual minimum or the established practice is one which depends on the objectives of the calculation, not facts or assumptions.

8.15 In such circumstances, the entity's regulator may impose a principle to be applied in estimating the cash flows. For example, the FSA's *Treating Customers Fairly* principle in life assurance regulation applies not only to the benefits ultimately paid to beneficiaries, but also to the allowance made for future cash flows when calculating the *realistic value of liabilities* (see paragraph 6.5(2)).

8.16 Conventionally, actuaries do not disclose the cash flows. Actuaries tend to disclose only their *discounted* value, ie the (reduced) amount, at the valuation date, which equates to the future cash flows, after allowing for investment returns at the assumed rate. There is no technical reason why the liability

cash flows could not be disclosed separately from any discounting (see paragraphs 8.37-8.41).

Risks

8.17 The entities with which actuarial work is concerned typically face a range of risks. But not all of the risks that an entity is faced with are reflected in actuarial work. For example, the failure to win new business is a key risk for many insurers, just as it is for most businesses. But the impact that the loss of new business has on the actuarial calculations falling within the scope of BAS standards is limited to the effect on the expense reserves.

8.18 The major risks associated with actuarial work falling within Categories A and B are generally economic or demographic in nature, so far as life insurance and pensions are concerned, and *catastrophe* claims in the case of general insurance. It is likely that the same would be true for any specific classes of Category C work for which the BAS determines that standards should be written, but the Conceptual Framework will not rule out the possibility that classes of work brought within scope might be susceptible to other types of risk.

8.19 For some calculations, the entity's regulator may identify a number of risks, or risk categories, which must be taken into consideration. For example, the Lloyd's rules for valuing syndicate liabilities specify a number of risks and risk scenarios that must be taken into consideration.

Link between the risks and the assumptions

8.20 By definition, every risk relates to something which cannot be known with certainty. So, for every (material) risk which might affect the outcome of the actuarial calculation, there must be an assumption to address that risk. Sometimes the link may be obvious and direct. For example, the risk associated with motor claims is addressed directly by way of a probabilistic assumption relating to that risk.

8.21 But sometimes the link between the risk and the assumption is more obscure or indirect. For example, in a *deterministic* calculation (explained in paragraph 7.11), the risk of a stock-market crash is effectively ignored if, as is invariably the case, the discount rate is a positive rate of interest. A *stochastic* calculation process (also explained in paragraph 7.11) can allow for the probability of a market crash. Alternatively, individual scenarios can be tested by making a specific assumption that the market will crash (see *stress testing* in paragraph 8.48(c)).

8.22 Some risks may be capable of mitigation, or even elimination, through management action. For example, the risk associated with interest rate fluctuations can, in theory, be eliminated by holding assets which exactly "match" the liabilities (in the sense that the income and capital redemption monies from the assets exactly match, by date and by amount, the liability payments to beneficiaries). In practice, the liability payments to beneficiaries are almost invariably based on assumptions (for example, mortality) which may not be fulfilled, so the scope for interest rates to move adversely is not entirely eliminated.

8.23 Where mitigating actions have been taken by management, it may be appropriate for the actuarial calculation to reflect that action. For example, the "matching" investment strategy referred to in the previous paragraph

would have implications for the assumption relating to investment returns. But where such mitigating action is reversible (for example by changing the investment strategy) and if no allowance has been made in the calculations for the possibility of such a reversal, there is an implicit assumption in the calculation that the mitigating actions will be kept in place.

BAS STANDARDS RELATING TO THE CALCULATIONS WITHIN THE SCOPE OF THE CONCEPTUAL FRAMEWORK

8.24 Where appropriate, BAS standards may specify for the calculation of *liabilities* and of *future assets* (see paragraph 8.2(2) above):

a) one or more permitted *methods* or *measures* for the purposes of a particular class of calculation and a particular calculation objective;

b) tests to be carried out on the *data* and/or adjustments to be made to compensate for uncertainty in, and appropriateness of, the data;

c) limits on the range of the *assumptions* to be used in particular classes of calculation; where the entity's own regulator has set a requirement for prudence or for a best estimate, or some other such criterion, BAS standards may specify how the criterion is to be applied in that particular context (see also paragraphs 8.26-8.30 below);

d) principles to be applied when *estimating cash flows* in circumstances where facts and assumptions are not sufficient, on their own, to enable the cash flows to be estimated;

e) types or classes of *risk* which must be taken into account for the purposes of actuarial calculations and also the extent to which steps taken to mitigate the risks may be allowed for; and

f) the *mechanism* (or *link*) by which certain types of risk are taken into account by using specified types of assumptions.

8.25 In all cases listed above, a limit will be stipulated in standards only if the limit is deemed appropriate by the BAS and the limit does not conflict with the governing legal document (ie the regulations or other legal instrument between the entity and the beneficiaries).

8.26 In the case of (c) above (limits on the range of assumptions), it is likely that, initially at least, any limits will be expressed in terms of a formula or yardstick by which the assumption range automatically alters with changing circumstances, rather than expressing the limits in absolute numerical amounts. So, for example, a maximum assumed rate of return on investments equal to, say, the yield on (a class of) corporate bonds is a limit which varies in line with the prevailing markets, whereas a limit of, say, 5% pa does not.

8.27 But the Conceptual Framework will not preclude the BAS from imposing limits expressed in numerical terms where this is the more practicable route. This might arise where either:

a) the BAS takes the view that a demographic or economic factor changes only slowly and that there is no formula or yardstick which is appropriate, or preferable to a numerical range, for constructing the limits; the *reasonability override* described in paragraph 5.15 will serve as a protection against a sudden and unexpected change rendering numerical limits inappropriate more quickly than the BAS can issue a revised standard; or

b) there are subject-specific committees appointed to advise the BAS, from time to time and for certain pre-determined classes of assumptions, on a range within which the assumptions should be set for the purposes of specified actuarial calculations.

8.28 There are no immediate plans for setting up committees of the type described in sub-paragraph (b) above, but the BAS envisages that such committees may be created in due course, subject to consultation on the matter prior to the committees' creation.

8.29 Where other regulators have set criteria such as *prudence* or a *best estimate* etc, BAS standards may specify additional criteria. It is not, of course, the role of the BAS to (re)interpret regulations set by others – and certainly not to (re)interpret regulations made by Parliament – but the BAS considers that it would be a proper exercise of its functions to specify how prudence is to be achieved in a given context (for example the calculation of a pension scheme's *technical provisions*).

8.30 It would be a matter for the entity's own regulator to decide whether or not to accept the BAS's specification so far as the entity was concerned. But, in practice, the BAS would not publish such a specification without first establishing that the entity's regulator would endorse it.

ACTUARIAL REPORTS WITHIN SCOPE OF THE CONCEPTUAL FRAMEWORK

8.31 The BAS proposes to develop a generic Reporting Standard (in line with the proposals in paragraph 2.55 of the Morris Review) which will specify material which should be included in reports on actuarial calculations within the scope of the Conceptual Framework. The Reporting Standard will set the minimum requirements for inclusion in such a report. The standard will not restrict, in any way, the inclusion of additional material which report writers deem appropriate.

8.32 The Reporting Standard will recognise that regulations and other governing documents may use one particular term (eg valuation) when another (eg planning) is better suited to the particular calculation, but standards will encourage or require reports to include an explanation of the true nature of the calculation as part of the accompanying communication (unless, if ever, prohibited by regulation from doing that).

8.33 The Reporting Standard will require actuarial reports that fall within the scope of BAS standards to disclose, where applicable, the factors described in paragraphs 8.34-8.55 below. The standard will have the status of *Compulsory* or *Comply or Explain* etc, according to category within which the underlying work falls (see paragraph 3.9). If none of the factors are applicable – for example, because the report does not address any calculations relating to cash flows – the Reporting Standard will not apply and there will be no need for the report to refer to the standard or to state that is has not been applied.

Calculations

8.34 The following aspects of the actuarial calculations should be disclosed:

a) the *nature and objective* of the calculations, identifying any particular *measures* adopted to specify the nature or objective (see paragraph 6.10 for examples of measures used to specify a particular objective in the context of a pension scheme's *technical provisions*); and

b) the *methodologies* used to achieve the calculation objective and, where applicable, the specific *measure* adopted.

Data

8.35 The report should include a description of the data provided and, where there is any uncertainty over the accuracy of the data provided, a description of the uncertainty and an explanation of the measures taken to avoid the uncertainty in the data causing a misleading presentation of the entity's financial position.

Assumptions

8.36 The following aspects of the assumptions should be disclosed:

a) All material *assumptions*, whether implicit or explicit and whether qualitative or quantitative; this requirement will apply to assumptions used in the context of *stochastic* calculations (ie any assumptions incorporated within the *scenario generation* process) as much as to *deterministic* calculations.

b) A *justification* for the assumptions adopted, distinguishing fact from judgment (and distinguishing objective and subjective judgment). For example, the decision to adopt a particular set of assumptions regarding the future mortality of an insurance company's beneficiaries might be based on a combination of:

- past experience for the company in question (fact);
- a belief, based on the company's underwriting policy, that the company's higher-than-average (or lower-than-average) past experience is likely to be maintained in future (objective judgment); and
- an estimate of future mortality improvements, based on the actuary's own beliefs about the future course of mortality, rather than following industry norms (subjective judgment).

c) If assumptions are described as a *best estimate* or *central estimate*, the meaning of the term, as used in the particular report, should be explained. The report should make it clear whether the estimate applies to the *assumptions* or to the *outcome*[22] (unless there is no difference, or no material difference).

Cash flows

8.37 The total *undiscounted* amount of the projected cash flows, and the time period over which the cash flows are projected to be paid, should be disclosed in addition to any discounted figures incorporated in the results of the calculation. For the avoidance of any doubt, the cash flows referred to here are the cash flows relating to the trust, contract, or other legal instrument with the beneficiaries (eg claims, expenses and future premiums in a life

[22] For example, it is a mathematical effect of discounting that the mean assumptions do not give rise to the mean outcome. By way of a simple example, if £100 is discounted for 20 years at 3% pa, 4% pa and 5% pa, the outcomes are £55.37, £45.64 and £37.69, respectively. The mean outcome is, therefore, £46.23, but the outcome derived from the mean assumption (4% pa) is £45.64. More complex scenarios can lead to more significant differences.

insurance contract), not the cash flows from the *existing assets* (investments) of the entity.

8.38 For example, a report to pension scheme trustees might include a statement along the following lines:

> "Based on the assumptions described [elsewhere] in this report, the liabilities of the scheme are estimated to be £100m payable over a period of 80 years following the valuation date."

8.39 The Reporting Standard will not restrict where, in the report, such a statement should be made. Report writers may find it convenient to juxtapose such a statement with a statement of the *discounted* value of the cash flows, with the result that the presentation might be:

> "Based on the assumptions described [elsewhere] in the report, the liabilities of the scheme are estimated to be £100m payable over a period of 80 years following the valuation date. Taking into account the assumed rate of return on the scheme's investments, the value of the assets required today in order to meet the liabilities as and when they fall due is estimated to be £15m."

8.40 The second sentence in that example uses language appropriate to a funding plan. If the calculation being reported on were the calculation of the scheme's *technical provisions*, the sentence might be:

> "… Taking into account the investment return assumption, the amount of the technical provisions at the valuation date is calculated as £15m."

8.41 In the case of a *stochastic* valuation, where the cash flows themselves vary with each run, for example in the case of options or guarantees under a life insurance policy, the report should disclose the *expected value* of the undiscounted cash flows.

Risks

8.42 The key risks faced by the entity should be disclosed, setting out:

a) the *nature* or *origin* of the risk (eg investment returns, mortality or, in general insurance, other factors which could affect claim amounts);

b) an explanation of the *link* between the *risks* and the *assumptions* made in relation to the risks (see paragraph 8.43);

c) whether the *frequency* or the *cost* of the risk is *measurable*; for example, the cost of a hurricane might be capable of estimation, but the frequency (in the UK) is not; and

d) whether actions taken by management can be said, objectively, to have *mitigated* or even eliminated the risk (see paragraph 8.44 below); and

e) the *relative importance* of the risk in relation to the other risks faced by the entity, the *relative degree of concern* the entity should have for various scenarios and the entity's *capacity* or *appetite* to bear the risks (see paragraph 8.45).

8.43 The BAS considers that one of the keys to good reporting of actuarial work is to address the *implications* of the information in the report (see also paragraph 8.55 below). The explanation of the link between the risks and the

assumptions (see sub-paragraph (b) above) is one mechanism by which the implications can be addressed.

8.44 As discussed in paragraphs 8.22-8.23, some risks may be capable of mitigation, or even elimination, through management action. Sometimes this is a matter of subjective judgment. In such cases, the Reporting Standard will not require the report to express such an opinion, because the investigation required to assess the likely effects of the mitigating action may go beyond the scope of the work commissioned. But where a course of management action has been put in place and can be said, objectively, to mitigate or even eliminate the risk, this fact should be included in the report.

8.45 The *relative importance* of a risk, the *degree of concern* the entity should have for various scenarios and the entity's *capacity* or *appetite* to bear the risks are interrelated. These matters should typically be taken together.

8.46 Some of the items listed in paragraph 8.42 above arise, by definition, each time a calculation is reported on to an entity, for example the risks taken into consideration in the calculations and the link between the risks and the assumptions made. The items in (a) and (b) would appear to fall into that category, because they are directly linked with the assumptions made, and should be included in each report on a calculation.

8.47 But the remaining items, (c) to (e), are perhaps not intrinsic to each and every calculation, for example they would not be relevant to a calculation of *transfer values* for members leaving a pension scheme. The Reporting Standard would not, therefore, expect those items to be included in the report every time a calculation is reported on. But the matter should be addressed and communicated to the entity periodically. The frequency of reporting is a matter which may need further research before the Reporting Standard is published. But one approach which naturally presents itself is for the Reporting Standard to identify certain specific pieces of work for which items (c) to (e) must be included, for example a report on a pension scheme's *technical provisions* or a report on an insurer's *liability reserves* for the purposes of its FSA returns.

Outcomes

8.48 The report should disclose the following:

a) the results of the calculation, differentiating between:

- *values*: identifying, more particularly, which values are a *market value*; a *regulatory value* or a *contractual value*; an *accounting value*; a *value in use*; or some other value; the items in this list are not mutually exclusive; some outcomes may be capable of more than one description, for example an accounting value, which is also the market value; and

- the outcome of a *planning*, *targeting or budgeting* process: explaining whether the process is one of *asset liability modelling* (ie assessing the sufficiency of the existing assets); a *funding strategy* (ie suggesting the rate of input of new assets); the *release of surplus* (ie discretionary increase in liabilities); or some other planning process;

b) where the report addresses a quantification that has been carried out previously for the entity – usually one year or three years previously – the report should include a comparison of the outcomes on this occasion with the outcomes on the previous occasion;

the comparison should be supported by a reconciliation of the current results with the previous results; such a reconciliation might be in the form of an analysis showing how the surplus or deficit revealed by the previous valuation, together with events since that valuation and any differences in the methods or assumptions at the two valuation dates, have led to the surplus or deficit revealed by the current valuation;

the detail of the reconciliation should be proportionate to the benefit the user would be expected to obtain from the information and may be limited by what it is practical to do, especially if the previous calculations were made by an actuary from a different firm;

c) the *uncertainty* of the results: there are a number of ways which might be used to express the uncertainty of the results, for example by reference to a *range* (eg from the Mth percentile to the Nth in the range of potential outcomes); the numerical consequences of *changes in assumptions*; *stress testing*, ie testing the outcome of extreme scenarios; the severity of potential losses and/or *value at risk* (*VaR*), ie the maximum loss that can occur over a given time period at a given confidence (ie probability) level; the method(s) used to express the uncertainty and the amount of detail communicated in the report should be proportionate to the scope of the work being reported on; and

d) for any report which estimates the value of liabilities, by whatever means, an assessment of the *probability* that the assets held by the entity at the valuation date will be sufficient to meet those liabilities, explaining which risks have been taken into account in assessing the probability (see paragraphs 8.49-8.51 directly below).

8.49 As noted in Section 7, not every risk is capable of being assessed probabilistically. Accordingly, the probability assessment described in sub-paragraph (d) above must necessarily be limited to those risks for which a probability distribution has been derived and the report should state which those risks are.

8.50 Moreover, the calculation (of the likelihood that the assets will be sufficient) can be performed only in relation to liabilities for which assets can be identified as hypothecated to those liabilities. The requirement would not apply, for example, to the calculation of a pension scheme's *transfer values* or an insurance company's *surrender values*.

8.51 The disclosures set out in sub-paragraph (d) above may require additional work beyond the scope required to produce actuarial reports for the purposes of the governing legal document (for example regulations requiring the calculation of a pension scheme's *technical provisions*). In accordance with standard FRC practice, standards will not be published until an *Impact Assessment* has been carried out, including a test of the likely cost of the work measured against the benefits expected to be gained from having the additional work carried out.

Communicating probabilities in reports

8.52 When using probabilities in a report, the report should explain:

a) whether a particular probability relates to beneficiaries, entities, scenarios, or some other class (as described more fully in paragraph 7.26);

b) the nature of any statistics on which the probability is based, distinguishing:

- *past evidence* of actual events, for example mortality experience;
- research into *expected future developments*, for example the impact of medical and societal change on future mortality improvements;
- how directly *comparable* the past events are to the events now under consideration, for example the application of general population statistics to an individual scheme;

[For the avoidance of doubt, sub-paragraph (b) does not call for detailed statistical evidence for each of the bullet points. It requires an explanation of the *nature* of the evidence and that the explanation distinguishes the three components listed in the bullet points.]

c) whether the analysis is objectively derived or subjectively estimated; and

d) the inferences that the report writer intends to be drawn from the probabilistic statement(s).

8.53 The BAS does not consider it would be practicable for the Reporting Standard to impose requirements on the language to be used when communicating probabilities, but report writers will be expected to distinguish between:

a) the level of complexity that can be presented to those who commissioned the actuarial work in question and to anyone else to whom the report is expected (at the time of writing) to be shown; this must be an individual judgement tailored to the individual readers and their statistical proficiency; and

b) the complexity of the analysis that can be carried out in actuarial work and/or presented to technically proficient individuals within the decision-making group, or to others such as the auditors or financial regulators.

Quality of communications

8.54 The Reporting Standard will note that the quality of reporting is important, particularly since actuarial reports have hitherto gained a reputation for being difficult to understand. A high-quality explanation of the matters listed above (ie the *calculations* and the *outcomes*) is important.

8.55 As noted above, the BAS considers that one of the keys to good reporting of complex matters, such as actuarial work, is to address the *implications* of the results. The Reporting Standard will encourage writers of actuarial reports to pay particular attention to this aspect of communication, but the Reporting Standard will not attempt to set measurable criteria by which the *quality* of an actuarial report can be assessed. The Reporting Standard will make it clear, for the avoidance of any doubt, that so long as the requirements for including specific material have been met, the standard will be deemed to have been complied with.

SPECIFIC REPORTING STANDARDS

8.56 The proposal above to have a generic Reporting Standard is unlikely to be the BAS's final word on reporting. Where appropriate, the BAS would expect to write *topic-specific* reporting standards which impose additional reporting criteria in addition to the generic requirements described above.

For the reasons set out in this section, the BAS proposes:

- the *general principles* set out in paragraph 8.2;
- the *quantification principles* set out in paragraphs 8.3-8.30;
- a *generic reporting standard* as set out in paragraphs 8.31-8.55.

The BAS would welcome respondents' views on all of these proposals.

The BAS would particularly welcome respondents' views on the proposal in paragraph 8.48(d) for actuarial quantification of liabilities to include an assessment of the probability that the assets held by the entity at the valuation date will be sufficient to meet those liabilities, with a particular focus on:

- **any practical problems in assessing the probabilities which the proposal calls for; and**
- **any limitations on the usefulness of the information if one or more of the probabilities has to be omitted from the assessment.**

9 INVITATION TO COMMENT

QUESTIONS

9.1 The BAS invites the views of those stakeholders and other parties interested in actuarial practice who wish to comment on the content of this document. In particular the BAS would welcome views on the following issues:

1 Following the terminology of Section 3, the BAS has determined that Category A should fall *within* the scope of BAS standards and that Category E should fall *outside*. In that context:

a) Do respondents consider the five categories drawn up by the BAS (defined in paragraph 3.9) provide a meaningful way to determine which areas of work should be within scope and which should not?

b) Which, if any, of Categories B, C and D do respondents consider should be within the scope of the framework?

c) The BAS would also welcome feedback, and real examples, indicating whether the non-regulatory element of Category B exists in practice or illustrating any concerns that the definitions are wrongly capturing or omitting areas of work.

2 The BAS has set out proposals regarding the objectives and characteristics of standards in Section 4. Do respondents agree with them, specifically the proposals:

a) to introduce some generic standards, to provide coherence and consistency across areas of work, in addition to topic-specific standards as is the case now;

b) that standards be principle-based, rather than rule-based; respondents are asked to identify any advantages or disadvantages that they consider may flow from this approach; and

c) that standards address outputs and responsibilities, as now, with output-based standards focusing on the users of actuarial services and their needs as decision makers?

3 Do respondents foresee any practical issues or problems that they consider should be addressed in relation to the enforceability of standards, as set out in Section 5, in order to ensure the efficient functioning of the enforceability proposals?

4 Do respondents agree with the proposals in section 8 for:

a) the *general* principles set out in paragraph 8.2;

b) the *quantification* principles set out in paragraphs 8.3-8.30;

c) the *generic reporting standard* set out in paragraphs 8.31-8.55?

d) the proposal set out in paragraph 8.48(d) for actuarial quantification of liabilities to include an assessment of the probability that the assets held by the entity at the valuation date will be sufficient to meet those liabilities; respondents are asked to focus, in particular, on:

- any practical problems in assessing the probabilities which the proposal calls for; and
- any limitations on the usefulness of the information if one or more of the probabilities has to be omitted from the assessment.

9.2 In addition to the specific questions listed above, the BAS invites respondents' views on any other issues that may impact on the Conceptual Framework. To ensure that the significance of their point is fully appreciated by the BAS, respondents are encouraged to indicate how their comments affect the proposed Framework.

9.3 In particular, as noted earlier in this paper, the BAS regards Sections 6 and 7 of the Consultation Paper as setting out matters of current and historical fact, together with logical analysis based on those facts, rather than matters of judgment or policy. The BAS would welcome respondents' feedback on the material set out in those sections if respondents believe any of it to be ill-founded, but asks respondents to take note that the implications for the Conceptual Framework of this material follow in Section 8, which therefore provides a more effective opportunity for making comments.

RESPONSES

9.4 For ease of handling, we prefer comments to be sent electronically to **basnovember07@frc.org.uk**.

Comments may also be sent in hard copy form to:

The Director
Board for Actuarial Standards
5th Floor, Aldwych House
71-91 Aldwych
London
WC2B 4HN

9.5 Comments should reach the FRC by **31 January 2008**.

9.6 All responses will be regarded as being on the public record unless confidentiality is expressly requested by the respondent. If you are sending a confidential response by e-mail, please include the word "confidential" in the subject line of your e-mail.

A ABBREVIATIONS AND GLOSSARY

A number of technical terms, or terms which may be unfamiliar to some readers, are used in this paper. In general, the terms are explained when they arise in the paper. For additional reference purposes, the terms are listed below, together with an explanation of the meaning ascribed to them *in this paper*. **The BAS does not intend this glossary to serve as a reference source for interpreting other documents.**

Organisations	
AADB	The Accountancy & Actuarial Discipline Board
Actuarial Profession (or the Profession)	The collective term for the Institute of Actuaries and the Faculty of Actuaries
BAS	The Board for Actuarial Standards
FRC	The Financial Reporting Council, the UK's independent regulator responsible for promoting confidence in corporate reporting and governance. The AADB, BAS and POB are operating bodies of the FRC
FSA	The Financial Services Authority
POB	The Professional Oversight Board
TPR	The Pensions Regulator

Ordinary English terms used with a particular meaning in this document	
beneficiaries	Refers mainly to members of pension schemes and holders of an insurance policy, but also to any individual or organisation entitled to receive benefits from an entity which commissions actuarial work (see paragraph 3.11)
Comply or Explain	Proposed status for actuarial standards when applied to work which may be commissioned from non-actuaries (see, especially, Section 5)
calibration	In the context of this paper, the term used to describe the setting of assumptions and other graduations applied to a *scenario generator* (see actuarial terms below)
catastrophe	A term used in general insurance to describe an individual incident (such as a hurricane) which leads to exceptionally large claims
existing assets	Term used to distinguish between assets in existence and those, such as future premiums, or future contributions (*future assets*)
future assets	Assets such as future premiums to an insurance company or future contributions to a pension scheme, as opposed to assets that already exist (*existing assets*)
impact assessment	A term used in the context of regulation to describe the assessment of the costs and benefits of proposed regulations

Ordinary English terms used with a particular meaning in this document (ctd)	
planning	Term used in this paper to highlight the difference between the process to arrive at a provisional estimate (*planning*) as distinct from crystallising an amount to be applied in a transaction or recorded in a formal document (*valuation*)
prudence	Term used to distinguish assumptions intended to yield a conservative result (*prudence*) from assumptions which are neither conservative nor optimistic (*central estimate*)
reasonability override	Proposed feature of BAS standards which may permit a standard not to be applied (see, especially, Section 5)

Terms from finance and economics	
discounting	In financial terminology, the calculation which converts a stream of cash flows at one or more dates to an equivalent figure at another (usually earlier) date
fair value	An accounting term for *value in exchange*
mean reversion	In the context of financial markets, the propensity for valuation indicators (for example, the price/earnings ratio) to tend to return over time to a long-run average
net realisable value	An accounting term for the value obtained on the sale of an asset
risk	Favourable or unfavourable outcomes, see Section 7
risk neutral	In the context of this paper, an alternative name for the *market consistent calibration* of an economic scenario generator
stress testing	Testing the outcome of an actuarial process under extreme scenarios
uncertainty	Another term for *risk*, but sometimes used to connote outcomes which cannot be assessed probabilistically
valuation	The process used to determine a *value*, not to be confused with *planning* (see above)
value	An amount assigned to an asset or liability in a particular context (see *value in exchange* and *value in use* below)
Value at Risk (VaR)	The maximum loss that can occur over a given time period at a given probability level
value in exchange	The realisable value of an item if sold by a willing seller to a willing buyer
value in use	The value derived from the continued ownership of an asset or liability

Terms from the insurance and pensions industry	
asset shares	Insurance term used to describe the result of apportioning to each policyholder the assets held in a with-profit fund

Terms from the insurance and pensions industry (ctd)	
buy-out	In the pensions and insurance context, the term used to describe the transfer of pension liabilities from a pension scheme to an insurer
funding valuation	The process for ascertaining an appropriate level of contributions to pay into a pension scheme – more accurately described as a funding plan
market value reduction	Reduction in benefits payable under a unitised insurance contract
mathematical reserves	One particular measure of life insurance liabilities required, by the FSA, to be assessed by the insurer
realistic peak	A measure of a life insurance company's liabilities plus required capital margins (see also *regulatory peak* below)
realistic value of liabilities	One particular measure of life insurance liabilities sometimes required, by the FSA, to be assessed by an insurer
recovery plan	In the context of pensions, a financial arrangement for increasing the assets of a scheme so that they exceed the value of the *technical provisions* (see below)
regulatory peak	A measure of a life insurance company's liabilities plus required capital margins (see also *realistic peak* above)
statutory solvency valuation	One particular measure of pension scheme liabilities required, by regulation, to be assessed by schemes
surrender value	Amount payable to policyholders of a life insurance policy on voluntarily terminating the policy early
technical provisions	One particular measure of pension scheme liabilities required, by regulation, to be assessed by a scheme
transfer value	Amount payable from one pension scheme to another when a member transfers their rights between schemes
treating customers fairly	Term used in insurance regulation to describe the insurer's duty to pay due regard to the interests of its customers and to treat them fairly
twin peaks	Term used by the FSA to refer to two alternative calculations of life insurance liabilities

Actuarial and mathematical terms	
asset liability modelling	Projecting assets and liabilities under a range of different possible economic scenarios to evaluate alternative strategies
best estimate	There is no agreed definition of the term: one popular use is the *mean* (or average) of the distribution of outcomes
central estimate	In a range of possible outcomes, the outcome which is just as likely to be exceeded as undershot

Actuarial and mathematical terms (ctd)

current unit method	A measure (not a method) of defined benefit pension scheme liabilities which reflects the benefits payable to members as if they left service on the valuation date (see paragraphs 6.9-6.10)
deterministic calculation	A calculation using a single set of assumptions
expected value	(Loosely) the average amount of the outcomes in a random trial when an event is repeated many times over
gross premium method	An actuarial valuation method for determining the discounted value of life insurance liabilities
Guidance Notes	The name used for standards originally issued by the Actuarial Profession prior to the inception of the BAS
market consistent value	The value of an asset or liability calculated, in the absence of an observable market for the item, in a manner intended to estimate the price that would be paid in an exchange between a willing buyer and a willing seller
matching assets	A portfolio of assets constructed such that that cash flows from the assets exactly replicate, by date and by amount, the cash flows of a (matching) liability
mean	(Loosely) the mathematical term for the *average* value in a range of values
median	(Loosely) when a series of outcomes is arranged from lowest to highest, the median is the middle one
projected unit method	A *measure* (not a method) of defined benefit pension scheme liabilities which includes an allowance for expected future salary increases
prospective calculation	The calculation of the discounted value of future (net) cash flows under a portfolio of life assurance contracts
real world	In the context of this paper, an alternative label for the calibration of an economic *scenario generator* when used for *planning* purposes
retrospective calculation	The calculation of a value of a portfolio of life assurance contracts by accumulating past cash flows
scenario generator	A piece of software which generates a random series of alternative future scenarios
stochastic calculation	A calculation using multiple scenarios, as distinct from a *deterministic* calculation using a single set of assumptions

B MEMBERS OF THE BOARD AND WORKING GROUPS

THE BOARD FOR ACTUARIAL STANDARDS

Members

Paul Seymour (A)	Chair
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"A" denotes a Fellow of the Institute of Actuaries or the Faculty of Actuaries

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Members	Title
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Manoj Bhaskar (II)	Manager, Traded Credit & Market Risk, HSBC
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Tim Gordon (A)	Principal, Gordon Consulting
Rob Green (A)	Director, Deloitte & Touche
Steven Haberman (A)	BAS Member. Professor of Actuarial Science and Deputy Dean of Cass Business School, City University
Paul Ingram (I)	Global Head of Traded Credit and Market Risk, HSBC
Andrew Lennard (O)	Research Director, Accounting Standards Board
Chris Lewin (A)	Chairman, RAMP Working Party
Jonathan Macdonald (A)	Director, PwC
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Jerome Nollet (L)	BAS Member. Corporate finance advisor in risk and capital management
Derek Pike (A)	Project Director, BAS
Tilly Ross (A) (I)	Group Head of Pensions, National Grid plc
Ben Rowe (A)	Chief Actuary, FSA
Crispin Southgate	Consultant to asset managers and corporates on pension plan investment
Steve Townsend (A) (II)	Group Insurance and Market Risk Director, Lloyds TSB
Steve Wearne	Head of Strategy, Regulation and International Division, Food Standards Agency

A Fellow of the Institute of Actuaries or the Faculty of Actuaries
L Group Leader
O Observer from the FRC
I Stage I only
II Stage II only

STAKEHOLDER INTERESTS WORKING GROUP

Members	Title
Rosemary Beaver	Head of International Compliance, Lloyd's (and Chair of the Insurance Institute International Committee)
Jocelyn Blackwell	Director, Capita Hartshead
Steve Balmont	Director, Law Debenture
Roger Carroll	PR Consultant, Bell-Pottinger
Norma Cohen	Financial Times
Hilary Daniels	POB Member. Formerly Chief Executive, West Norfolk PCT
Christopher Daws	BAS Member. Consultant to, formerly Financial and Deputy Secretary, Church Commissioners
Fiona Draper	Independent pensions consultant/trustee
Dianne Hayter (L)	BAS Member. Board member, National Consumer Council
Melanie Johnson	ABI Consumer Impact
Trevor Larman	Independent Trustee, Golden Charter
Julian Lowe	BAS Member. General Insurance Actuarial Director, Aviva plc
Anne Maher	POB Member. Formerly Chief Executive of the Pensions Board for Ireland
David Metz	Financial Services Consumer Panel
Peter Murray	Trustee, retired pensions manager, Railway Pensions Scheme
Patricia Peter	Head of Corporate Governance and Employment, Policy Unit, Institute of Directors
Penny Shepherd MBE	Chief Executive, UK Social Investment Forum
Anna Sofat	IFA, AJS Wealth Management Ltd
Doug Taylor	Which?
Roger Turner	Executive Officer, Occupational Pensioners Alliance

L Group Leader

VALUE WORKING GROUP

Members	Title
Bill Abbott	International Actuarial Association
Mike Arnold (A)	BAS Member. Principal and Head of Life Practice, Milliman
Guy Ashton	Managing Director, Head of European Company Research, Deutsche Bank
Nigel Bankhead (A)	Director, BAS
John Bannon (A)	Group Director, Liverpool Victoria
Stewart Calder (A)	Head of Life Actuarial and Actuarial Function Holder, AXA
Lawrence Churchill (L)	BAS Member. Chairman, Pension Protection Fund
Ruth Goldman	Head of Pensions, Linklaters
Nigel Green	Previously Director of Financial Control, Nestlé
Pat Hakong	Head of Accounting Policy, Lloyds Finance & Risk Management
Chris Hitchen (A)	Chief Executive, Railways Pension Trustee Company Ltd
Malcolm Kemp (A)	Executive Director Quantitative Research, Threadneedle Investments
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Peter Tompkins (A)	Partner, PwC
James Tuley (A)	Chief Actuary, FSA
Phil Turner (A)	European Partner, Mercer Human Resource Consulting
Martin Weale	BAS Member. Director, National Institute of Economic and Social Research.
Martin White (A)	Actuary, Resolute Management Services Ltd

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L Group Leader
O Observer from the FRC

C LIST OF RESPONDENTS TO THE PRELIMINARY CONSULTATION PAPER

W M Abbott

ACMCA Ltd

The Actuarial Profession

The Actuarial Profession's Disciplinary Board

Aon Consulting

The Association of Consulting Actuaries

The Chartered Institute of Public Finance and Accountancy

Deloitte

Ernst & Young

Foresight Trustees

Jeremy Goford

Government Actuary's Department

Hewitt

Hymans Robertson

The Institute of Chartered Accountants in England and Wales

KPMG

Lane, Clark & Peacock

Mercer Human Resource Consulting

The Pensions Regulator

PricewaterhouseCoopers

Punter Southall Limited

Clifford Sharp

The Society of Pension Consultants

Standard Life

Paul Thornton

Watson Wyatt Worldwide

D A BRIEF HISTORY OF THE BOARD FOR ACTUARIAL STANDARDS

D1 In March 2004, the Government asked Sir Derek Morris to undertake a wide-ranging review of the actuarial profession. The Review took place against a background of the criticisms of the actuarial profession made by Lord Penrose in his inquiry into the Equitable Life. Lord Penrose had been asked by the Government in 2001 to enquire into the circumstances leading to the situation of the Equitable Life Assurance Society and to identify any lessons to be learnt for the conduct, administration and regulation of life assurance business. The Morris Review was published in March 2005.

D2 The Review concluded that the Profession's approach to standard-setting had failed to ensure a coherent, consistent and comprehensive set of standards. The Review set out a modus operandi for a new standard-setting body, created as an operating body within the Financial Reporting Council, with a recommended early step being to set out an appropriate conceptual framework, which would include the explicit objectives and characteristics of technical standards, broadly equivalent to the Profession's existing Guidance Notes.

D3 As part of the proposal, the Actuarial Profession would continue to set ethical standards subject to oversight by the POB. If the POB had concerns about the quality of the Profession's ethical standards or if the BAS believed it appropriate, the BAS should have reserve powers to issue ethical standards.

D4 The new Board agreed its Aims and Objectives. They incorporate the need to ensure that technical standards are coherent, consistent and comprehensive. In accordance with the Morris Review recommendation, the objectives include the development of a conceptual framework to guide the setting of relevant standards. The framework should set out the explicit objectives and characteristics of such standards. Another objective is consideration of the need for a generic standard for the communication of actuarial advice.

D5 The Aims and Objectives also set out the guidelines the BAS will use in carrying out its work. Working on the basis that well informed users are the best regulators, the guidelines include a commitment to be consultative, involving preparers and users of corporate and actuarial reports, the wider public and other regulatory organisations in its decision-making and allowing adequate time for consultation. They also include a commitment to be transparent and efficient and to ensure that appropriate publicity is given to the work of the BAS.

D6 More recently, in April 2007, the FRC published its *Strategic Framework* which included, as the strategic goal relating to actuarial practice, that: "Users of actuarial information can rely on its relevance, reliability, transparency of assumptions, completeness and comprehensibility."

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