

Subject ST7

CMP Upgrade 2017/18

CMP Upgrade

This CMP Upgrade lists the changes to the Syllabus objectives, Core Reading and the ActEd material since last year that might realistically affect your chance of success in the exam. It is produced so that you can manually amend your 2017 CMP to make it suitable for study for the 2018 exams. It includes replacement pages and additional pages where appropriate. Alternatively, you can buy a full set of up-to-date Course Notes / CMP at a significantly reduced price if you have previously bought the full-price Course Notes / CMP in this subject. Please see our 2018 *Student Brochure* for more details.

This CMP Upgrade contains:

- all significant changes to the Syllabus objectives and Core Reading
- additional changes to the ActEd Course Notes, Question and Answer Bank and Series X Assignments that will make them suitable for study for the 2018 exams.

1 Changes to the Syllabus objectives and Core Reading

1.1 Syllabus objectives

There have been no changes to the Syllabus objectives.

1.2 Core Reading

This section contains all the *non-trivial* changes to the Core Reading.

Chapter 7

Page 7

The second sentence on this page now reads:

“At the start of 2017 there were 105 syndicates at Lloyd’s.”

Chapter 16

Page 23

The paragraph beginning **“This over-estimation or under-estimation of reserves ...”** has been deleted.

Chapter 17

Pages 17 to 22

Section 4 has been re-written due to changes in the IFoA’s professional guidance. Please use replacement pages 17 to 22 provided at the end of this Upgrade.

Chapter 19

Page 6

The following text has been added into Section 1.6:

“*Operating environment*”

The model should also take account of what is happening internally within the company and its potential influence on future cash flows. For example the potential impact of high staff turnover on ability to meet regulatory deadlines or the loss of an underwriting team on the ability to meet a business plan.

There should also be some consideration of potential changes in legislation and their impact, for example the potential impact of a change in the Ogden discount rate on future claims payments.”

Page 26

The fourth bullet point now reads:

- **“Catastrophe claims (natural and man-made), often with assumptions around class of business splits.”**

Page 34

The third point in the list has been changed to:

“3) underwriting years”

A fifth point has been added to the list:

“5) different types of losses, eg between attritional losses and large losses”

Chapter 20

Page 25

The following text has been added after the first sentence of Section 4:

“Liquidity risk is sometimes included in either market risk or operational risk rather than as a standalone risk group in some models.”

Page 29

The first bullet point now reads:

- **“correlation between reinsurers / intermediaries, particularly where counterparties are related (for example, subsidiaries of the same parent group or syndicates at Lloyd’s)”**

Page 33

The last two paragraphs of Core Reading now read:

“We may use stochastic techniques in assessing the capital impact of operational risk. While we may be limited to determine the parameters, we can still model it stochastically using simulations of operational risk losses. It will usually be modelled as frequency / severity but can be modelled using probability distributions either for the risks combined or for individual operational risk types.

Operational risks are usually considered separately by sub-risk groups and assessed by personnel with the skills to appraise such risks.”

Page 35

The following text has been added after the first sentence of Section 7:

“This may be included in operational risk rather than as a standalone group in some models.”

Page 37

The following text has been added after the second sentence of Section 8:

“These risks are included within operational risk in some models.”

2 Changes to the ActEd Course Notes

This section contains additional *significant* changes to the ActEd Course Notes. However, if you wish to have all the changes to the ActEd Course Notes, you will need to buy a full set of the up-to-date version (which you can do at a significantly reduced price if you have previously bought the full-price Course Notes / CMP in this subject).

Chapter 6

Page 6

In the first paragraph, the following sentence has been deleted:

“For example, in the UK, the solvency margin requirement is close to 16%.”

Chapter 7

Page 23

The first paragraph of ActEd text and the five bullet points that follow it have been replaced with:

“Institute and Faculty of Actuaries (IFoA) members practising in the UK need to comply with the Technical Actuarial Standards (TASs) that are issued by the Financial Reporting Council.”

Also on page 23, Question 7.10 has been deleted.

Page 30

Solution 7.10 has been deleted.

Chapter 8

Page 31

The third paragraph now reads:

“In calculating UPR, an allowance might be made for initial expenses. The calculation of the UPR is discussed in Chapter 14, Triangulation methods.”

Chapter 13**Page 16**

The whole of this page has been deleted.

Page 23

Solutions 13.10 and 13.11 have been deleted.

Chapter 15**Page 5**

In the paragraph after Question 15.3, the reference to TAS R has been changed to TAS 100.

Chapter 16**Page 31**

In the second table on this page, the link factor residual for accident year 2011, development year 1 should be -0.010, not -0.020.

Chapter 17**Page 11**

In the Exam Tip, the reference to TAS R is now obsolete and has been deleted.

Pages 17 to 22

Section 4 has been re-written due to changes in the IFoA's professional guidance. Please use replacement pages 17 to 22 provided at the end of this Upgrade.

Chapter 22

Page 11

In Section 2.6, the second paragraph of ActEd text now reads:

“TAS 100 discusses the importance of communicating uncertainty.”

Also on page 11, Question 22.6 has been deleted.

Page 20

Solution 22.6 has been deleted.

3 **Changes to the Q&A Bank**

This section outlines the *non-trivial* changes that have been made to the Q&A Bank. However, if you wish to have all the changes to the Q&A Bank, you will need to buy a replacement CMP (which you can do at a significantly reduced price if you have previously bought the full-price CMP in this subject).

Q&A Bank 3

Solution 3.17

The third line of the solution now reads:

“Over the policy year, if the risk increases from 0 to say 2 units by the end of the policy year, then the total risk over the year is 1 unit.”

Q&A Bank 4

Question 4.5

Question 4.5 and its solution have been deleted.

Solution 4.16

The third bullet point now reads:

- “... eg TAS 100 states that “communications shall indicate the nature and extent of any material uncertainty in the actuarial information they contain.” [1]”

Q&A Bank 6

Solution 6.19

The penultimate line of the table has been corrected. It now reads:

+ Investments	see Note 1	24.8	see Note 3	39.2
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In Note 3, the calculation of monthly Expenses has been corrected. It now reads:

“Monthly expenses $-(1.008^5 - 1)/(0.008/1.008) \times 1.008^7 - 5 = (0.4)$ ”

4 **Changes to the X Assignments**

This section outlines the changes that have been made to the X Assignments.

If you wish to have all the changes to the X Assignments, you will need to buy a replacement CMP (which you can do at a significantly reduced price if you have previously bought the full-price CMP in this subject).

However, if you wish to have your assignments marked by ActEd this session then you can order the current assignments free of charge if you have purchased them in the same subject the previous year (*ie* sessions leading to the 2017 exams), and have purchased marking for the 2018 session.

Assignment questions

There have been no changes to the assignment questions.

Assignment solutions

Solution X1.3

The following two disadvantages have been added:

“A maximum premium could result in more high-risk policyholders taking out cover (as it would cap their premium). [½]

A minimum premium may be unaffordable for some policyholders. [½]”

Solution X5.2

The following points have been added to the solution:

“*Percentile method* [½]

The percentile method allocates the aggregate diversified capital requirement down to the sub-portfolios with reference to a lower percentile than was used to determine the overall requirement, or with reference to various percentile-defined layers. [1]

This prevents over-allocation to catastrophe-type business. [½]

The Shapley method allocates capital with reference to an average of the marginal capital requirements, assuming that the class under consideration is added to the overall portfolio first, second, third and so on. [1]

This can be used for a small number of classes, but in practice it quickly becomes onerous when more classes are modelled. [½]

Solution X5.3

The following point has been added to the solution for part (ii):

- “territories in which business is written [½]”

Solution X5.5

In part (i), the following point has been added after the paragraph that starts “During the system failure period, ...”

“Similar issues may also affect business that is due to be renewed, meaning that policyholders lapse and take their business elsewhere instead. [½]”

Solution X5.7

The sentence that starts “In order to predict volumes ...” now reads:

“In order to predict volumes of business, it may be necessary to consult with sales managers and business planners. [½]”

The following point has been added:

“Volumes may also be affected by internal changes within the insurer, eg loss of underwriting staff could impact the ability to meet planned premium income targets. [½]”

Solution X5.9

The reference to TAS R has been changed to TAS 100.

Solution X6.2

In part (iii), the following sentence was duplicated in error:

- “use of prescribed bases to calculate premiums, asset values and liabilities to demonstrate solvency [½]”

One of these instances has been deleted so that this point is now only worth [½] and the number of marks available is now [Total 3].

5 **Other tuition services**

In addition to this CMP Upgrade you might find the following services helpful with your study.

5.1 **Study material**

We offer the following study material in Subject ST7:

- Flashcards
- MyTest
- Revision Booklets
- ASET (ActEd Solutions with Exam Technique) and Mini-ASET
- Mock Exam A
- Additional Mock Pack.

For further details on ActEd's study materials, please refer to the 2018 *Student Brochure*, which is available from the ActEd website at **www.ActEd.co.uk**.

5.2 **Tutorials**

We offer the following tutorials in Subject ST7:

- a set of Regular Tutorials (lasting three full days)
- a Block Tutorial (lasting three full days).

For further details on ActEd's tutorials, please refer to our latest *Tuition Bulletin*, which is available from the ActEd website at **www.ActEd.co.uk**.

5.3 **Marking**

You can have your attempts at any of our assignments or mock exams marked by ActEd. When marking your scripts, we aim to provide specific advice to improve your chances of success in the exam and to return your scripts as quickly as possible.

For further details on ActEd's marking services, please refer to the 2018 *Student Brochure*, which is available from the ActEd website at **www.ActEd.co.uk**.

5.4 *Feedback on the study material*

ActEd is always pleased to get feedback from students about any aspect of our study programmes. Please let us know if you have any specific comments (*eg* about certain sections of the notes or particular questions) or general suggestions about how we can improve the study material. We will incorporate as many of your suggestions as we can when we update the course material each year.

If you have any comments on this course please send them by email to **ST7@bpp.com**.

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into your Course Notes***

Other relative merits of stochastic and deterministic approaches include the following:

- **Deterministic approaches only consider a limited number of factors and one result from each.**
- **Failure is often due to the interaction of many differing factors which could not be modelled deterministically.** The stochastic model can allow for the interdependency of these key factors.
- **Analysis of the impact of atypical scenarios aids understanding of variation around expected outcomes, and assigns a distinct value to them.**

In practice, we are likely to use all or a combination of the above techniques.

This will be in part dependent upon the stability of the class of business and the credibility of the past data available.

We should select the approaches which are appropriate to the scale, complexity and importance of the analysis, taking into account the cost / benefit balance to the user.

4 ***Communicating best estimates***

The ideas discussed in this part of the Core Reading should be familiar to you from your study of Chapter 13.

It is important to be able to explain reserve estimates and ranges clearly and effectively to the various interested parties, such as senior managers, the board of directors and the regulator. We should bear in mind the use to which the recipient of the advice is likely to put it.

The information provided should enable the intended audience to understand the nature and the size of the uncertainty that is faced. The appropriate communication of this is as important as the calculations themselves.

4.1 ***Communicating best estimates***

The commonly used phrases “best estimate” or “central estimate” can mean different things to different people.

Furthermore, we should not communicate the best estimate in such a way that gives the impression that it is the only “right” answer or “point” estimate. Rather, when providing a point estimate, it is important that the actuary is able to communicate effectively the inherent uncertainty surrounding that estimate to key stakeholders.

There are a range of possible outcomes because of the uncertainties described above. Some outcomes are more likely than others. We should make clear that the best estimate is the mean of the distribution of the range of possible outcomes. The best estimate does not necessarily represent the most likely outcome, especially if (as is usual) the distribution of the range of possible outcomes is positively skewed.

A positively skewed distribution will have a tail extending out to the right (larger numbers). For this distribution, the mean is greater than the median reflecting the fact that the mean is sensitive to each score in the distribution and is subject to large shifts when the sample is small and contains extreme scores.

The best estimate is just an estimate. There can be a tendency for the best estimate to be treated as being a more reliable prediction than it is intended to be and than it really is. Any user of the information should understand that it is just an estimate, that there are other possible reasonable estimates and that the ultimate result is likely to be different to the estimate.

TAS 100 states that the nature and extent of any material uncertainty should be communicated to the user of the actuarial information.

We should also highlight the key assumptions made. There will often be a number of critical assumptions that the best estimate and/or reserve ranges are most sensitive to. The reliability of the result will depend on the appropriateness of these assumptions. The user needs to be aware of what these assumptions are and the sensitivity the result has to these.

TAS 100 states that communications shall state the material assumptions and describe their rationale.

We should comment on the main restrictions (or shortcomings) in the analysis. These could include incomplete data, restrictions in the scope of the work or lack of information provided on company policies.

For example TAS 100 states that communications shall:

- include explanations of any significant limitations of the models used and the implications of those limitations
- describe any material uncertainty in the data and the approach taken to deal with that uncertainty.

It may be that the actuary wants to present an overall measure of uncertainty for the company, *eg* by combining the results from the individual classes of business. In this case some adjustment may be made to the figures to reflect the benefits of diversification.

4.2 *Communicating uncertainty*

For many purposes, it will be appropriate to give an estimate of the uncertainty surrounding the best estimate by giving a margin or range. A range of reserve estimates can help key stakeholders understand the uncertainty inherent in the business. In this case it will also be necessary to define the meaning of the margin or range and communicate it carefully.

For example, when selecting a reserving basis where we make key judgements that have a material impact on the estimates, we should communicate these key judgements when giving the estimates.

TAS 100 states that material judgements shall be communicated to users so that they are able to make informed decisions.

We should state clearly the extent to which the margin or range is intended to reflect the various sources of uncertainty.

Question 17.9

Can you remember the four sources of uncertainty in a reserving model?

The terms used to describe the sources of uncertainty can mean different things to different people. When describing a reserving basis we should define these terms carefully and communicate them in a way that is appropriate to the audience.

The purpose for which the reserving exercise is being carried out has a direct effect on the importance of the uncertainty surrounding the reserving process and estimates. This in turn may affect the reserving basis selected for the purpose in question.

The UK's Technical Actuarial Standard (TAS 100) requires any communications to indicate the nature and extent of any material uncertainty in the information contained in the report.

In this context, the uncertainty may concern the results of calculations, the assumptions on which the information in the communication is based or other aspects.

Note that on the assumption that the phrase “best estimate” means the actuary's best view of the mean or expected value of the eventual outcome (possibly excluding certain remote contingencies), then we can think of a range described as “a range of reasonable best estimates” as a range that illustrates the parameter uncertainty and model error alone.

Note that since actuarial judgement is involved to a greater or lesser extent in all of the methods of quantifying uncertainty, different actuaries examining the same tranche of business would produce somewhat different illustrations of uncertainty.

In recent years, actuaries have increased their focus on communicating uncertainty. Misunderstandings can sometimes occur because our stakeholders, who may have less technical training in the details of uncertainty, are not as familiar with some of the concepts as actuaries. Actuaries need to be careful to communicate uncertainty in a way which is intuitively comprehensible to non-actuaries. Stakeholders have expressed a strong preference for being told the range of potential outcomes. This is an intuitively straightforward concept and is directly relevant when we track the actual out-turn (outcome) of claim costs.

Question 17.10

Without referring back to your notes, write down three types of ranges that might be used by actuaries.

The quantification of uncertainty requires us to communicate both size and likelihood of the reserving requirements. The size is normally quoted explicitly, whereas the likelihood is normally communicated in two ways.

We can communicate uncertainty in two ways: using words (a qualitative illustration) **or numbers** (a quantitative illustration **often expressed in percentiles**). In practice, it is likely to be a combination of these two approaches.

The use of percentiles is a way of communicating uncertainty not a way of estimating the uncertainty. For example, the actuary may have exercised judgement to examine alternative sets of assumptions when estimating uncertainty but this can still be communicated using percentiles.

The method we choose depends on the technical knowledge of the audience, but we note that any valuations of percentiles may imply more certainty of the distribution than is warranted. It is worth stressing that a percentile is often a percentile within a particular model and is not immune to residual model error (or indeed parameter error).

Example

An example of adopting the percentile approach when communicating to the audience would be to say:

“... this equates to the 90th percentile, meaning that in my judgement there is a 90% chance that the outcome will lie below this value and a 10% chance that it will lie above.”

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into your Course Notes***