

WORKING PARTY ON ACTUARIAL REPORTING

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The terms of reference were as follows:-

1. To prepare a draft of possible notes for the guidance of actuaries who may be called upon to report on the technical reserves which a company should establish.
2. To prepare a draft of possible notes for the guidance of actuaries who may be called upon to report on the financial strength of a company.
3. To prepare drafts of specimen reports corresponding to 1 and 2 above.
4. To obtain information about the types of report which actuaries have already submitted, corresponding to 1 and 2 above.

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SECTION I

INTRODUCTION

The object of this paper is to provide a reference document for an actuary writing non-life reports. The object is to provide a comprehensive checklist of points that need to be considered when writing a report. This checklist is designed to serve two purposes. Firstly, to act as a guide for the work the actuary must carry out in order to be able to draw reasonable conclusions as to the reserve adequacy or solvency of a company, or part of a company as the case may be. Secondly, an actuary writing a report would be expected in the full report to either specifically cover the various items concerned or else satisfy himself that they are not relevant to the case in hand. Where a particular item is deemed by the actuary not to be relevant but might be thought by a third party to be relevant, it would be incumbent upon the actuary to incorporate in his report a statement as to why he did not consider a particular point to be relevant.

The paper is in five sections. Firstly, there is some material to set the scene and provide some basic principles and background as to the role of the actuary in the financial reporting of non-life companies. The second section is essentially the checklist of items that would need to be covered and has been sub-divided down into data requirements, assumptions and areas of uncertainty and also reserving methodology. This section is not in anyway intended to be a text book on claims reserving techniques, but more a checklist of items that need to be considered. The third section provides notes on how reports could actually be formulated and what needs to be included as well as some suggested drafts of parts of reports. The fourth section deals with particular aspects of solvency reporting but is in no way meant to pre-empt the solvency working party. The fifth and final section provides some background information on actuarial certification as it is being introduced in other parts of the world. However, the rest of the report needs to be considered in a UK context.

"TRUE & FAIR" VIEW OF ACCOUNTING

1. The Companies Act provides exemption for insurance companies not to have to provide "true & fair" accounts in the same sense as other industrial companies. Some insurance organisations are not governed by this exemption under the companies act and therefore do have to provide "true & fair" accounts. The most notable of these is the CIS.
2. Auditors rely on the exemptions to mean that companies can reserve in an extremely conservative way, but they are not allowed to put up deficient reserves. There is possibly some upper limit to the degree of conservatism that an auditor will allow. This seems to be a matter of varying practice amongst auditors and it would seem that it would be only in the most extreme circumstances that any pressure would be put on a company to reduce a reserve in their audited accounts. This would seem to be a concept that we should debate further. Consistency also needs to be considered.
3. "True & Fair" probably requires some degree of prudence in reserving notwithstanding the explicit capital base and reserves possibly calculated on a true expected basis, may not meet all the requirements. However, in practice, I think that most companies would get away with putting aside best estimates provided they can justify these.
4. Under Canadian GAAP, conservative reserves are allowed, however, under US GAAP, reserves are to be based on a reasonable estimate and where reserves are clearly too high they are not allowable. Reserves are not allowable even if it is conceivable that the existing reserve may prove to be low, but is unlikely to be too low.
5. When a particular reserve is unquantifiable, under "true & fair", presumably some qualification should be made to the accounts, whereas this may not be the case under UK statutory accounting. An example would be a products liability reserve on a major block of business, for which no real rating or reserving data was available.
6. The auditors approach to life assurance companies is to regard the actuary as a professional and to check his approach, as an intelligent person and not as an expert. Would this be a reasonable approach for us to expect, auditors to take to appropriately qualified general insurance actuaries?

7. DTI (formerly DOT) returns are not "true & fair" in that they are designed to ensure the solvency of a company. This implies a degree of conservatism that would not be appropriate in a "true & fair" situation. A good example of this would be in respect of catastrophe reserves or internal reinsurance reserves which are not uncommon in the UK but which are not allowed under US GAAP.

8. It is imperative in a report that an actuary makes it clear on what basis he is making estimates and where the company may use his numbers for different purposes spell out how they should be altered. It is also important to explain to whom the report is directed and if other people might have access to it under what circumstances.

DISCOUNTING

The subject of discounting of claims reserves is somewhat outside the scope of this report. It is, however, the subject of discussion now for example in the States by the accountants as to the appropriateness or otherwise of requiring companies to discount reserves. However, in the vast majority of cases in this country, it is unlikely that there would be any obligation on the actuary to consider discounting unless specifically requested to do so by his principal. In the light of the current UK practice we would normally not consider it appropriate for an actuary to impose or recommend discounted reserves except in unusual circumstances. One case where it may be appropriate for an actuary to produce discounted reserves in a financial report, would be in the case where a company was insolvent or almost insolvent on a non-discounted basis, but clearly solvent on a discounted basis. However, the main thrust of this report assumes that non-discounted reserves are to be produced although the report is applicable more or less without any adaptation to the case where the actuary is producing discounted reserves. Clearly, unless he has been specifically requested, if an actuary produces discounted reserves he should explain why.

Further, it should be pointed out that in most parts of the world accounting standards expect non-discounted reserves to be set-up for the more usual lines of business.

QUALIFICATIONS OF AN ACTUARY

The qualifications of an actuary are of paramount importance. The Institute guide clearly makes the point that no actuary should undertake a task for which he is not fitted, and this would naturally apply to non-life insurance as well as any other actuarial task. However, it perhaps takes on even more importance in the non-life field than in the other areas. The non-life examination syllabus does not provide a sufficiently comprehensive professional basis for reporting on non-life claims reserves or solvency margins for any but the most straightforward of companies. Consequently it is probably appropriate to develop a code of conduct or specific experience requirements in guideline form for actuaries signing actuarial reports in the non-life field. Such a code of conduct is outside the scope of the terms of reference of this working party, though part of this report could form part of that code. It is something that perhaps Giro should consider with some degree of urgency if the UK actuarial profession is ever to achieve the professional status that organisations such as the CAS have obtained in relation to the property casualty industry there as opposed to individual actuaries obtaining personal recognition in their own companies or within the industry generally. It is important to realise that this professional standing is of more importance with the smaller companies than with the larger companies and as with most business problems, of course, 90% of the problems are derived by 10% of the business.

It may be of interest that there was a somewhat similar problem in the States where the requirement to certify reserves is membership of the American Academy and so it is possible for a Fellow of the Society of Actuaries i.e. with no non-life qualification to qualify as a loss reserve specialist. However, the American code of conduct guide, like the Institute also requires that an actuary has experience appropriate to the task in hand. However, it is interesting to note that in this specific area of loss reserve certification, the Academy provided specific guidelines as to the sort of things that actuaries should be familiar with in order to sign off on loss reserves. The list was virtually a reprint of the CAS syllabus. Due to the limited Institute syllabus, e.g. there is no detailed knowledge of coverages involved, this clearly would not suffice. Furthermore, it is of extreme importance to realise that there are many differences between different classes of business, particularly in terms of policy coverages and definitions and market practice. Thus, considerable experience in motor insurance would by no means equip an individual to analyse some of the longtail London market books of business.

In any event it is important that the actuary making the report states his qualification, it is probably not appropriate to put in any experience requirement into the report, but if there is any doubt in the actuary's mind of his ability to actually undertake the task concerned, this should be explained to his principal before accepting the assignment. This would also include cases where they may be very limited data and so it may be difficult for any one to come to firm conclusions.

A further point that needs to be considered in developing guidelines for actuaries to deem themselves to be qualified to undertake specific tasks in the non-life field is that if the subject of reserve certification ever comes up, it is clearly important that the actuary concerned should be qualified. It is also important that the profession establish itself in the eyes of the public and other professional bodies especially accountants, that they do have particular expertise in this area.

WHY ACTUARIAL REPORTING?

Throughout this paper we are discussing actuarial reporting. This has had the implicit assumption that an actuary is the person best qualified to carry out this task. In countries such as the USA, where there is a clearly defined casualty actuarial qualification, there can be no doubt as to this. There was some 'crossing of swords' with accountants over certification of reserves in the States, but the casualty actuaries eventually won the day. Clearly, the Italian actuaries have also demonstrated the right to sign reports as have the Finns and Bermudian authorities also seem to be going down the actuarial route. However, it is far from the case that the actuary is accepted as being the most appropriate person in the UK.

The vast majority of Fellows of the Institute do not have any general insurance experience. It is essential that this is recognised by the profession, if it is to gain acceptance in the general insurance area and that claims should only be made for expertise in non-life reporting by those actuaries who have general insurance experience and have knowledge appropriate of the classes of business in which they are working.

Demonstrating this knowledge is somewhat difficult. However, the main contenders are principally the accountants who also do not have any significant examination content on insurance. Until the Institute ever has a serious general insurance option consisting of several papers, the case of the actuary to certify reserves in this country must depend on his own personal experience, together with the knowledge of his overall actuarial background. The basic training in probability and variability in results are essentially different from that of an accounting approach and it is this difference that provides the actuary with an advantage over an accountant. The actuarial training does provide a reasonable feel for the insurance process, which is not obtained by an accounting background (though certain accountants may possess it) and which is essential for any specialist in this area. This is also a major advantage an actuary has over a statistician operating in the non-life area. Non-life insurance is not just about random numbers, but involves the actions of insureds, as well as random events and unless one has an intuitive grasp of how the insurance mechanism works, then one is likely to run into problems.

In order to enhance the profession's standing in the general insurance field, it is essential that members who intend to practice in this area, demonstrate themselves knowledgeable, not only in respect of actuarial matters, but also the basics of policy

wordings, why different wordings are used, differences in coverage, principles in the design of policies. Why for example, claims made policies are used in certain circumstances as opposed to occurrence based policies with the relative advantages of each. None of these things are covered in the UK actuarial literature or examination syllabus and this is a severe disadvantage in the profession establishing itself in the non-life field in this country.

FEASIBILITY OF ACTUARIAL CERTIFICATION IN THE UK

Given the recent tightening of the proportional treaty market, and the vulnerability of reinsurers to inadequate claims reserving on such business, it might be thought that a lead could be given by them towards requiring some form of actuarial certificate or reporting at the time of writing a treaty. Clearly until recently this was, impractical as otherwise the business would have been placed elsewhere, but there must be a number of companies at this point in time who are wondering how the current renewal season is going to treat them, and one solution to that could be an actuarial assessment of their reserve situation. This is reasonably commonplace for example in the medical malpractice market.

It seems to the sub-committee writing this report, that there is an implicit assumption by the profession that actuarial certification is not practicable in the UK at the current time due to the dearth of experienced personnel to carry out such work. The following sets out to demonstrate that this is in fact a fallacy and that actuarial certification could be introduced in the very near future, subject of course to the profession being able to demonstrate its capabilities to the public at large and the acceptance of other professions, notably accountants, that certain actuaries are more qualified than virtually all accountants. This would seem to be a very much more serious objection to the introduction of actuarial certification than the manpower question.

There are some 600 companies authorised by the Department of Trade to carry on non-life insurance in the UK, of whom some 340 are BIA companies. Attendance at Giro meetings in recent years has hovered around the 70 mark, while mere attendance at a Giro meeting does not demonstrate capability in determining non-life claims reserves, it gives some idea of the interested numbers. In addition to the actuaries attending Giro, in a number of companies there are a number of statisticians and other similar professionally qualified people who are carrying out essentially the same work as a casualty actuary. In our view, and indeed the practice in the USA on the introduction of certification would be to 'grandfather' such people to certify the reserves for such companies. They will be responsible for signing certificates in exactly the same way as an actuary would in their own name. However, such people would only have the capability to sign such certificates in respect of the company in which they are working, and then only provided they have been carrying out such work for a minimum period of time, say the last three years. This approach might eliminate some 250-300 companies including companies within the same group. This might leave some 300-350 companies, who would mainly be dependent on consultants and any outside

advice that employed actuaries might be in a position to give. The major part of the problem is of course that most companies have a December year end and that, therefore, much of the work would be involved in the first few months of the year. This could be overcome to some extent by allowing the certification process to be carried out at times other than the year end, but it is probable that most companies would find that unsatisfactory as if they realised if they are going to have a certificate then they are not going to wish to finalise the results without having had a prior approval of the actuary signing the reserves.

However, of the remaining 300 companies, in fact a large number of these are writing either very small amounts of business where the work involved would be negligible or writing very simple straightforward short-tail accounts. Here the workload would not be substantial. An actuary could sign certificates fairly rapidly, once the companies are aware of the data requirements. With a number of companies it may also not be appropriate to require annual certification but, only say, certification every third year as used to be the case with life companies, though this is fraught with dangers given that a general insurance company can deteriorate rapidly. This would almost certainly eliminate a further 150-200 companies. For the remaining 100 or so companies, there is likely to be a very considerable overlap due to the way the London market system works. A large amount of underwriting is done by a few underwriting agency companies, who write large quota shares for many different people. Consequently, looking at one particular company and its particular shares on an agency would in fact cover significant blocks of business of other companies. Indeed it is probable that the more complicated the business from the analysis point of view, the more likely it is that there are several companies that have significant lines of the agencies' business, and where the agency business is probably the major area that any actuary would investigate. Thus, although 100 companies may seem a formidable number in reality it is possibly only some 25 blocks of business. Certainly, it has been at least one member of this working party's experience that this overlap can be significant. Furthermore, in most of these cases, the certification is only going to be one of adequacy and it will not be necessary to produce a precise estimate of reserves and for a significant number of the companies, as they will be sufficiently conservative that only a limited amount of work needs to be done to provide the appropriate certification.

Another approach to reduce the workload would be to eliminate all companies with a percentage of say 65% property business.

A significant number of such companies would, in any event, already be receiving advice from an actuary and so the number of totally new companies where there would

be substantial amounts of work involved may only total some 50-75. This number could be absorbed by existing consultants and employed actuaries, who are in a position to give outside advice. Consultants would no doubt gear themselves up to some extent to ensure that they provide a satisfactory service. It is of interest to know that when certification requirements were introduced in the US, it was felt by some that there would be a bonanza for the consultants and there would be difficulty in obtaining the necessary certificates in time due to manpower problems. However, this has not proved to be the case and the experience of at least the largest US casualty consulting firm means that it has not made a material difference to its workload.

It is assumed in the above analysis that as with most types of insurance regulation, Lloyds would be treated separately and would not require certification as such. If each Lloyds syndicate were to be included separately then the manpower problems would be considerable. It would probably not be reasonable to expect any individual to certify Lloyds as a whole, if only because of the problems of dealing with the belated call of extra capital from names. However, given its recent well publicised difficulties and the new approach being taken, the day of the 'Lloyds panel actuary' may not be as many light years away as might originally have been thought two or three years ago.

SECTION II

INADEQUACY OF DATA

Inadequacy of data is possibly the most serious problem facing the actuary in this country at the current time. Hopefully, this will change as more companies become aware of the need for some form of actuarial analysis. Also, of course, the cheaper electronic computing becomes, the easier it is to obtain a comprehensive database in a form that an actuary can interrogate. However, there will always be cases where there is an inadequate database, if only because companies will insist upon writing new lines of business! Consequently, in many cases the actuary would need to supplement the company database by outside sources of data. These might consist of other accounts that he has had experience of. This is a case where the consultant has a major advantage subject to problems of confidentiality. DOT returns can sometimes provide extra information but the very broad brush approach that is adopted there does mean that these are of limited value in all but the most blatant data shortages. Often reinsurers can provide help, having seen a wide number of accounts and have very often been supplied with primary data. Outside bodies will sometimes produce data such as Best's or RAA. Sometimes experience of a similar class of business in a different country may provide guidelines to another country though considerable care is needed in this area. In any event where an actuary has to rely on some outside data to supplement the company data he should point this out in the report and also attempt to demonstrate its validity or where he cannot do this, try to envisage the impact of deviations from the actual data that he is using.

DATA REQUIREMENTS FOR A PRIMARY WRITING OFFICE

The Institute literature provides in some detail the database requirements for a company writing the more common lines of business such as motor, domestic fire, etc. In most cases the actuary would require information on the basis supplied. In particular in most cases he would require claims numbers, claims payments and case estimates. This might be regarded, normally as a minimum data requirement, though in certain circumstances one may be able to form opinions just with payment or incurred claims data, though any actuary would need to be satisfied that his development triangles were going to remain stable.

Where only inadequate data is available, or only DOT Returns data, then the actuary must make a professional judgement as to whether that is sufficient for him to draw any reasonable conclusions, or whether he should appropriately qualify his report. In many cases it would be appropriate in the report to draw attention to the data inadequacies. Very often, unless the report is definitely of a one-off nature, this will lead to better data being supplied in future years. This is particularly likely to be true if the actuary can draw attention as to why the data supplied is inadequate and what the possible consequences might be of his not receiving the data in the format he would prefer. The following section is designed to illustrate an ideal situation. Clearly, the more ideal the data, the more precise the estimates can be. However, this is not to say that reasonable conclusions cannot be drawn with less than the full amount of data but the actuary must point out any limitations.

TECHNICAL CLAIM RESERVES

The section on Reserving Methodology identifies the five separate components of the total claims reserve. IBNR and reopened claim provisions can only be made by statistical techniques and the appropriate data should be collected over a period of years to build the models and identify trends.

The provision for known outstanding claims has traditionally been established on an individual case estimate basis by the judgement of a claims official. The advantages and disadvantages of this approach are well documented but any actuarial assessment of the adequacy of the reserves requires the creation of an historical data base of claims information as specified in the Appendix.

The number of claims case estimated will depend upon the age of the claim, the class of business and the type of risk. Ideally a separate estimate should be raised on the claim for each of the type of claim payment codes involved. A serious claim code might be established at the outset, according to specified criteria, and these claims would be more closely monitored throughout their development.

An important aspect of the actuarial assessment of the provisions is the ability to assess the effect of changes in the valuation basis. With traditional claims estimating it is difficult to know the assumptions adopted by the individual estimator as any central direction can only be very generalised. Time saved by sample estimating could be used to collect more information on each estimate raised. Replacing the conventional estimate figure by:

- a. the estimator's best view of the likely outturn of the claim if the claim was to settle immediately under current judicial practice.
- b. estimated, money-weighted, mean outstanding term to settlement

leaves the actuary and the company management to apply:

- a. consistent, known margins in the provision

- b. inflation assumptions at a rate suitable to the class of claim
- c. anticipated trends in judicial judgements etc.
- d. allowance for investment income.

In this way changes in the valuation basis can be applied to case estimates as well as statistically projected payment patterns.

Many policies carry a limit of indemnity and voluntary or compulsory excesses which will vary with the section of the policy

e.g. a conventional domestic policy could carry a £250,000 limit of indemnity on property owners liability and £200 on cash stolen. There could be a £25 voluntary excess on water damage and a compulsory £50 excess might have been imposed by the underwriter for past bad experience.

Policy conditions vary with time, if only because of inflation, and a proper statistical interpretation requires data to be collected on the full cost of the insured event as well as the cost to the office. Establishing claims reserves after limits of indemnity have suddenly been doubled requires more than a knowledge of past trends in claim costs.

The main claim record contains the primary classification data and key dates in the history of the claim. Every payment/refund made on the claim requires a claim payment record at the level of the type of payment code. Every case estimate raised, or changed if the office operates a system of running estimates, requires a claim estimate record to be established and kept on historical files. This data base allows the actuarial measures of adequacy of claim reserves to be computed.

APPENDIX**Main Claim Record**

1. Claim number and check digit
2. Policy number and check digit
3. Homogeneous risk group classification
4. Date of occurrence
5. Date of notification to office
6. Date processed by computer
7. Date of final settlement
8. Code for territory where claim arose
e.g. the jury system of assessing liability claims in Northern Ireland has a significant effect on claim amount when contrasted with UK practice.
9. Serious claim code
10. Marker for a claim that has been reopened

Claim Payment Record

1. Date of payment
2. Cheque number
3. Gross amount of payment/refund
4. Code for currency of payment
5. Gross amount payment would have been if no limit of indemnity or excess had applied
6. Amount of payment/refund net of reinsurance
7. Amount of excess, compulsory or voluntary, deducted before payment made
8. Settlement marker to indicate whether the payment settled the claim
9. Type of payment code (e.g. accidental damage, medical expenses etc.)
10. If 'average' imposed for under insuring, % applied

Claim Estimate Record

1. Date of estimate
2. Type of estimate - ideally split to the level of the type of payment code
3. Currency code
4. Amount of estimate raised by Claims Department

REINSURANCE DATA

Reinsurance is not widely covered in UK actuarial literature. Consequently, a much more detailed data requirement section is included. This is likely to be of interest in its own right apart from the question of actuarial reporting. It is essential that any actuary getting involved in this area be aware of the very considerable complications and pitfalls of the data, and what can happen and what can't happen. It would be unprofessional conduct to rush into a number of areas without having had prior experience or at least talked to an actuary who has had some exposure in this area.

DATA

In his report the Actuary should comment on the suitability of the data available for the task in hand and make some observations on the quality of the data.

When working on London Market reinsurance business, it is extremely important that the Actuary shows an understanding of the likely areas of weakness in the data collection system and how his methodology needs to be varied to cope with the possible features underlying the data.

Some of the more important considerations are:-

1. Accuracy of Data

The nature of the business is such that clerical errors can have a significant effect on statistics. Companies are often taking small lines on very large exposures. Entering a loss 100% instead of the company's share, or ignoring a market order, can easily cause an error running into millions of pounds.

It is normal for London market companies to write business in many currencies. A simple error in transcribing a currency code can again have a very significant effect.

The common practice of making a 'portfolio transfer' of all outstanding losses on a risk from a closed year to an open year can be another source of large data errors. It is unfortunately not unknown for clerks to forget to remove the outstandings from the closed year so that the losses are double counted in paid and outstanding. (While we are on the subject of portfolio transfers, which are normally a feature of proportional business, it is worth mentioning that it is fairly common practice for proportional claims data to be the responsibility of the technical accounting department and for the non-proportional claims to be the responsibility of the claims department. The reason for this is that proportional business involves basically accounts information, with little or no information on individual claims. An Actuary examining and passing comment on the quality of the administration of claims data needs to be aware of this likely division of responsibilities.)

It is natural, in a system where outstanding claims are not regularly checked, that errors of understatement will stay at a relatively constant level and that errors of overstatement will tend to accumulate. If a new outstanding is not entered onto the computer file, a subsequent payment request or a revised estimate will lead to the discovery of the error. If a claim is settled, but the outstanding is not removed, it will stay in the system until someone physically checks the record.

The Actuary can gain good insight into the quality of the data administration using the following simple checks:-

(a) Assuming that data is presented in the form of development triangles, trace some of the more unusual jumps in the development back to individual risks to establish the reasons for the movements.

(b) Examine individually a sample of claims where the outstanding advice has not changed for, say, one year. The sample should cover proportional/non-proportional and short/long tail business.

(c) If a computer listing, showing the current position of individual risks, is available look for examples on proportional business of negative claims paid, with outstandings still on the previous year, e.g.

<u>Risk No.</u>	<u>Premium</u>	<u>Claims Pd.</u>	<u>Claims O/S</u>
82/1234	194,934	218,357	369,850
83/1234	85,982	- 294,291	350,263

This is likely to be an example of a portfolio transfer from 1982 to 1983, but with the outstandings not removed from 1982.

(d) Auditors usually check a random sample of claims records and prepare an exceptions report on any errors that they find. Study the exceptions reports for, say, the last three years.

2. Accounting System

The company's accounting system can have a considerable impact on development statistics. Many companies account in three currencies, US\$, Can\$ and Sterling. All other currency premiums and claims are converted to Sterling at the exchange rate ruling on the day the transaction is 'booked'.

Some companies account in a dozen or so currencies, with the remainder accounted in convertible sterling. These accounting systems lead to development data normally being held in one of the following forms:-

- (a) US\$, Can\$ and Sterling in original currency, all other currencies in booked Sterling for premiums, claims paid and claims outstanding.
- (b) Similar to (a), but outstandings held in original currency.
- (c) A larger number of currencies held in original currency, others as per (a) or (b) above.
- (d) If there is a more sophisticated computer system in use, all transactions in original currency.

(If required, I can produce some examples to show the extent that bias can be introduced into reserve calculations by the above systems.)

3. Reinsurance Protections

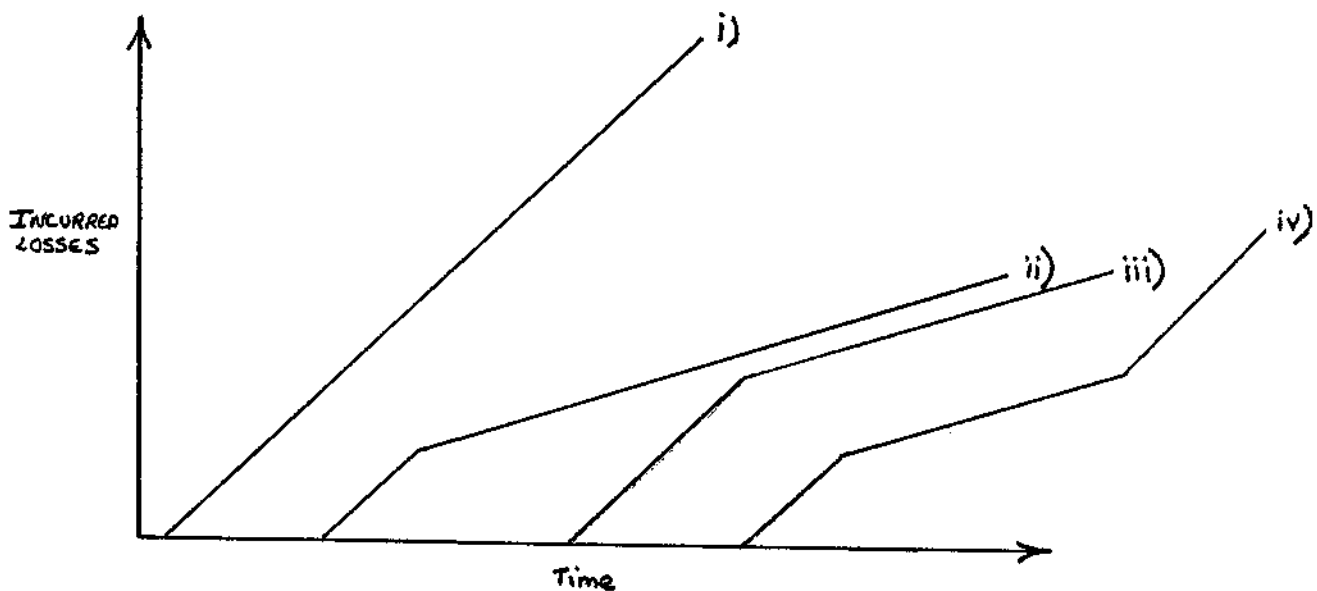
London Market reinsurers' own protection programmes are often very complex. Development data submitted on individual classes of business would probably be net of proportional retrocessions and facultative protections. (i.e. reinsurances which can be readily associated with individual risks), but would often be gross of the general excess of loss protections.

Pure net statistics would be likely to be available at a higher level (e.g. non-marine long tail) and it is tempting to use these aggregate statistics to avoid the difficult problem of projecting the excess of loss recoveries separately. Before doing this, one needs to study the protection programme to assess the likely impact on future net development. Examples of possible problem areas are:-

(a) The underwriting year of the protection may be different from the underwriting year of some of the inwards losses. A reinsurance which protects losses occurring 1st January to 31st December will, unless the recoveries are allocated to the underwriting years of the inwards risks, affect the net development differently from a reinsurance which protects "losses occurring on risks attaching 1st January to 31st December."

(b) Certain large risks or classes of risks may be excluded from the programme for particular years.

(c) Changes in the level of retention can have a significant effect on the development, particularly for long tail business. The following graph illustrates how a similar inwards loss experience could be affected by changes in retention on an excess of loss protection.



- i) Is protected excess of £100,000. There is little effect on net development.
- ii) Is protected excess of £10,000, subject to an aggregate deductible. There is normal development until the aggregate is expired. From that point a high proportion of the deterioration is relieved by the protection.
- iii) Similar to (ii), but the aggregate deductible is greater.
- iv) The aggregate deductible is similar to (ii), but the protection is subject to limited reinstatements. After all the reinstatements have been used, normal development continues.

4. Occurrence/Claims Made

During the mid-1970s, a large proportion of liability insurance (particularly professional indemnity) changed from occurrence form (i.e. accident year) to claims made form (i.e. report year). Clearly this has had the effect of shortening the development tail of that business, loss frequency being determined much earlier.

5. Unbalanced Book

Reinsurance companies write large numbers of small lines. However, it is possible that a sizeable proportion of the business is represented by a few large involvements. If this is the case, then these should be identified and dealt with individually.

6. IBNR In Outstandings

Where reinsurance companies have to set up letters of credit against outstanding claims, it is becoming increasingly common for the ceding company to require the letter of credit to also cover estimated IBNR. This means that on some risks, recorded incurred losses are in fact estimated ultimate losses.

7. Proportional/XOL

Due to the gearing effect, inflation can influence the development of proportional and excess of loss business quite differently, (again, I could include some examples to illustrate this.) One should therefore beware of data which combines the two types of business.

8. Index (Stability) Clauses

Index clauses were introduced for most non-American, excess of loss, casualty business in the late 1960s. Obviously one would have to look at the change in development since indexation was introduced. However, one must also consider how the indexed outstanding losses are held within the system. A company with an advanced computer system might continuously re-calculate outstandings to take into account latest values of the indices. Unfortunately, there are probably relatively few companies in this position. In a situation where an office has to deal with indexation on a manual basis, they may adopt the policy of always recording the outstanding to the original unindexed layer, only taking the index into account when a payment is made. This would generally cause overstatement of outstanding losses so that total incurred losses would increase rapidly and then decline. However, in the most common situation, where the limit and deductible are both indexed, losses which go right through the layer would be underreserved, so one needs to beware of a "sting in the tail" where these losses are settled on an average later than those which fall within the layer.

RESERVING METHODOLOGY

The publication "Statement of principles regarding property and casualty loss adjustment expense liabilities" published by the Casualty Actuarial Society makes the following comment on loss reserving methodology.

"Selection of the most appropriate method of reserve estimation is the responsibility of the actuary. A competent actuary will ordinarily examine the indications of more than one method before arriving at an evaluation of an insurer's reserve liability for a specific group of claims".

Any actuarial report must, therefore, clearly specify the actual reserving method used to produce the final results as well as any other methods used to test the adequacy of the basic method.

Essentially there are five separate components of the total claims reserve.

1. Case estimates.
2. The provision for future development on known claims.
3. The re-opened claims reserve.
4. Provision for claims incurred, but not reported.
5. Provision for claims in transit, i.e. not yet recorded within the company accounting system, but which have actually been reported to the company.

Although the total claims reserve includes provisions for all of the above, it is not necessary to specifically quantify each or any of the five provided the reserve in total is correct or adequate. However, if specific estimates are made for separate items then these should be justified if the split is on anything other than an arbitrary basis.

In most cases the actuary will come up with one method for the report but he must make it clear that other methods have been used and why not used for the final conclusions.

The reserving methods utilised should, where possible, include the following:-

1. Projections of incurred claims i.e. paid claims plus case estimates.
2. Projections of paid claims.
3. Estimates of the number and average amounts of outstanding claims. For certain classes of business claims numbers are not really meaningful, nor other statistics available e.g. in certain types of reinsurance business. Consequently, such methods requiring knowledge of claims number are not appropriate. This is discussed in more detail elsewhere. In any case care needs to be taken with projection methods especially for more recent years.
4. Estimates of claims ratios. This would include the so called Bornhuetter Ferguson method or the multiplication of an estimated loss ratio by an estimate of the unreported losses. This is particularly important for the later years, where projection techniques can be unreliable.
5. Historical run-off patterns of the selected method.

Where one of the above has not been used, the actuary must be confident that either the method will not provide any significant extra information, or that the method is not relevant or if the data is not available appropriately qualify his report. Complex statistical models have not been specified in the above list but there is no objection to using them. However, it is essential that they are explained in detail in any actuarial report and also validated by the use of simpler models. It is extremely difficult for non-actuaries to ascertain the validity or otherwise of a complex model. It is therefore essential that any actuarial report makes an attempt to show that a particular model is valid, in the circumstances of the case under investigation. In this context it is important to realise that a successful justification in previous years may not be sufficient to justify the use in the current year if conditions have changed somewhat.

There is a small amount of reference to curve fitting in different parts of the actuarial literature. Where curve fitting is used the choice of equation should be justified before any conclusions are drawn.

It is important to realise that it is not inconsistent to use different methods and different tests for different classes of business. Indeed it would be usual in any

investigation into a widely different range of businesses to use different techniques for different classes of business.

The actuary must form his own professional conclusions as to how to sub-divide the data within the realms of homogeneity and credibility as well as simple availability. It is important that in considering this grouping changes in settlement patterns and mixes of business are taken into account. Where possible, such changes should be justified by the data but in many cases this is not possible and some judgement as well as the imaginative use of actuarial techniques may be required to satisfy any one particular problem.

In any event the actuary should discuss results with underwriting and/or claims personnel and/or general management to ascertain any changes in the account, rogue years or any other factors which may affect the results before finalising his report.

In many cases an actuary will be asked to comment on the adequacy of reserves where a company involved has insufficient information. A usual example is a company writing longtail business but has only been writing its account for a few years. It is permissible for an actuary to utilise reliable data legitimately obtained from other sources. This could include the analysis of DOT returns of other companies, or the use of claims data supplied by another company. Where such data is used any actuarial opinion must make clear the dependence of the conclusions on the applicability of other data. The report must specify as to whether the actuary believes such data is valid or not. In any event most actuaries should consider their final results within an overall market context for reasonability. Some of the auditors in Bermuda have been known to qualify their accounts because there was inadequate data to justify the adequacy or otherwise of the reserves where a company was in its first few years of operation. We are not aware of a similar stand taken in this country.

PRESENTATION OF RESULTS - ASSUMPTIONS

The following is a check list of assumptions that can be made explicitly or implicitly. The actuary should ascertain the relevance of each to the account he is considering and where possible test them.

1. The terms on which the policies were written remained similar to previous years. If there was any change in the terms on which policies were written these should be stated.
2. The mix of type of risk covered is assumed to be as in previous years. If the type of risk has changed then any assumptions made about the change should be stated.
3. The length of the term of policies should be stated.
4. Data on premiums and claims is being reported at a similar level of accuracy as in previous years. Otherwise state why changes are believed to have occurred.
5. That premiums and claim data is being reported at a similar speed as in previous years. If this is not so state reasons why it is not so.
6. That given the above assumptions that all data used is reasonable. A note should be made stating the limits of reasonable lists of the data and any adjustments that it was necessary to make to the data.
7. That the methodology used is appropriate to the characteristics of the insurance contract, the nature of the claim and the limitations of the data available.
8. The formula used for calculating earned premiums should be stated. This should be appropriate to both the terms of the policy and the expected incidence of risk.
9. That appropriate additional provision for unexpired risks has been made when policies have been written at inadequate rates. This may include setting up a provision for policies written in the latter part of a rating series, particularly if inflation is at a high rate over the period of that rating series.
10. That the pattern expected for the reporting of IBNR claims will be in the future as it was in the past. Or else state what assumptions have been made.

11. That the pattern of claims payments in future will reflect those made in the past. Where adjustments are considered necessary for differences in inflation, state how these adjustments are made.
12. The rate of inflation in claims assumed, if this is explicit.
13. If claim inflation is implicit, the assumption that inflation in claim estimates will continue to follow the same relationship with the observed rate of inflation as it has done in the past.
14. It should be stated how changes in claims inflation other than the purely economic have been catered for. For example, changes in the levels of court awards.
15. That the types of claims and the amounts that they are settled for occur at similar rates as in the past. For example, in recent years there has been a huge rise in the number of Asbestosis claims, that were not previously anticipated.
16. That the frequency of claiming will follow the trend observed in the recent past. If this is not the case, state what assumptions have been made.
17. That the shape of the claim size distribution will remain as it has in the past. Or, state what assumptions were made about the claim size distribution.
18. That the current level of control of claims administration will be maintained. Or, state why it is assumed to be different.
19. That levels of expenses observed in the past will be maintained into the future. If the Actuarial report is for accounting purposes, this could effect the deductions for deferred acquisition costs or the reserves held for claims handling expenses.
20. Where overseas business is involved, state the exchange rates used.
21. State what assumptions are made about currency movements. State whether the projections are made in the currency concerned or in Sterling.
22. If multi-currency business is involved, it may be assumed that the mix by currency does not change. If it is otherwise, state assumptions made.

23. It may be implicit in the projection made that exchange rates and inflation move in step with one another. The relationship assumed between inflation and exchange rates should be stated.

UNCERTAINTIES IN RESERVES

Claims reserving is essentially an uncertain process and there is in most cases no one correct answer. However, in certain companies and certain types of business the degree of uncertainty can be very much greater than others. While, even where there is considerable uncertainty there can be much value in detailed actuarial analysis as this may considerably reduce the 'funnel of doubt'. However, where there is some considerable area of doubt, and the actuary is unable to satisfactorily resolve the uncertainty it is imperative that this is spelt out clearly in any report.

Such areas of uncertainty may be enumerated below. Again this is designed to be a checklist and it is up to the actuary to use his professional judgement as to whether any one particular uncertainty is worthy of comment. Where the degree of uncertainty is such that it will have a material effect on the overall results it clearly should be disclosed. It is important also, in any report, that where a third party might consider that there could be some uncertainty, but the actuary believes that he has resolved it, the report should clearly spell that out.

1. Uncertainties of definition, for example, disease claims may arise over period. Where should limits of period be drawn? If exposures extend beyond the present for IBNR claims, is liability to be appropriately reduced?
2. Uncertainties of scope. In many significant cases liability is ultimately settled by the courts and it is impossible, in advance, to know the extent of the company's involvement.

Material/social progression may also mean developments in processes/diagnostic techniques etc., which can provide unforeseen liabilities.

3. Uncertainties of wording of contracts: until tested by courts, new forms of wording may have implications not previously realised. Even when tested, further developments are possible.
4. Uncertainties arising from economic considerations. Inflation and its impact on claims - very complicated. Also social inflation (covered above?)
5. 'Stochastic' uncertainties - even after claim event occurred, further developments can significantly affect value, for example, progression of injured party. With regard to IBNR claims, exceptional year end conditions can lead to great difficulty in quantifying liabilities.
6. Uncertainties of 'accounting integration'. To what extent should reserves be modified, or re-categorised, so as to provide, if not a 'true and fair' view, then a reasonable view of activity. What is a reasonable view anyway?
7. Uncertainties arising from Personnel - to what extent is the company's current standard of generosity of payment to be continued in future?

CONCLUSIONS

It is essential that any actuarial report has a summary or conclusion highlighting the main findings of the report and the main areas of uncertainty. In my view it is not good professional conduct to hide a caveat or finding somewhat buried in the text, since it is unreasonable to expect many people to wade through the whole of the details of the report. It is perfectly legitimate, however, to refer to the detail of the report for an analysis of the degree of uncertainty but it is responsibility of the actuary in putting together a report to highlight the area concerned. What is included in the "conclusions" or not must be the professional responsibility of the actuary. However, it should include sufficient information for a reader to derive the broad outline of the actuary's opinion of the reserve situation. It should highlight any areas of uncertainty which where possible should be quantified.

CAVEATS

Since claims reserving is an uncertain process it is necessary to explain clearly in any actuarial reporting any uncertainty in the conclusions drawn. Given the present state of actuarial knowledge it is impossible to quantify much of this. However, it is important to spell out the qualitative degree of uncertainty where the amounts are significant and could have a bearing on the overall financial position of the company as a whole, some attempt must be made to quantify, in monetary terms, possible ranges of the liability if at all possible. The following outlines the potential uncertainties that need to be considered.

SECTION III**SAMPLE REPORT**

The following provides an example of some of the points that should be raised in a report.

For the employers liability class the paid claims development did not provide sufficient information to draw any real conclusions due to the slow development of the paid claims triangle. Consequently, most attention was paid to incurred claims development. However, analysis of the results and comparisons with overall industry trends suggested that there may have been significant case reserve strengthening. Discussion with the claims department indicated that this might well be the case. In particular, a more cautious approach is being taken to certain types of industrial disease claims, but also due to inadequate IBNR provisions in previous years, have tended to lead various personnel to produce more conservative case estimates. However, to resolve this satisfactorily, a full scale audit of a sample of claims files would be necessary. It is recommended that this be carried out.

Systematic case reserve strengthening leads to an overstatement of the ultimate claims liability. The reason for this is that in prior years there would have been greater adverse case development whereas now that more conservative case reserve estimates have been put up less development will be expected in future years. It is, therefore, necessary to adjust the development triangle judgementally. This has been done by examining the movements of the various diagonals of the account at, say, evaluation date, as well as comparing the results with those of a similar account. The workings are laid out in the appropriate appendices.

On the other hand on the motor account the paid claims development pattern is sufficiently well developed and provides a sufficiently stable base to provide reasonable conclusions. This gives a reasonable estimate of the result. In the case involved the inflation adjusted methods were used so as to take into account the different pattern of expected future inflation from that received by the account in the past. In doing this a special inflation index was constructed. The details of that index and the forecast are laid out in the appropriate appendix. The incurred claims development pattern showed similar results before making allowance for the different inflation adjustment pattern. It was, therefore, believed to be reasonable to use the inflation adjusted paid claims development.

For the sickness business numbers of claims and average size of claims were used to project the total result. Payments patterns and incurred claims patterns did not produce materially different results. Discussion with the underwriters and claims department suggested that there had been no changes in factors or other unusual features affecting the account and the results were, therefore, taken at their face value.

SAMPLE DATA DESCRIPTION PAGE

The data supplied to me included claims incurred run-off data and premium data for the medical malpractice account, sub-divided separately for the occurrence basis and the claims made basis. I also received similar run-off data in respect of the agency business written on behalf of the company by the ABC Underwriting Agency. This was sub-divided into longtail and short-tail business and further sub-divided into US and elsewhere. I was also supplied with data for the marine account and also for the aviation account. No split was available for the hull business separately. The marine & aviation data was supplied by the XYZ company who quota share to the company.

The data supplied to me also included the DOT returns analysis which were mainly provided for background information and checking the validity of other data.

In respect of the UK motor business, in addition to claims incurred run-off data I also had claims payment run-off data and claims numbers, sub-divided into comprehensive and non-comprehensive. Data was also available in respect of a scheme written through one large broker and this data also included in the whole account. However, analysis of this showed that the run-off pattern was not materially different from the whole motor account and so is not shown separately in this report.

The above data was not audited and to the extent that we have relied on that data and it is incorrect, our results are deficient. However, the motor information was reconciled back to the DOT data, which was commented on as satisfactory by the auditors. The data supplied by the company was also utilised by the auditors as part of their audit work and included in their audit file, but was not formally audited by them. In respect of the data supplied to us by the ABC Underwriting Agency on the XYZ insurance company, we have not been able to check the validity or otherwise.

I understand that the US longtail data written by the ABC Underwriting Agency, contains differing proportions of medical malpractice on an occurrence basis, general liability and umbrella business as well as products liability business. We understand that the proportion has been varying from year to year and we would recommend that run-off data be prepared separately for each of these classes. We understand that the data is coded and that given sufficient time, run-off data could be provided, but was not available within the timescale required for our report. I would recommend that this sub-division be prepared in time for the year-end work next year.

SAMPLE ASSUMPTIONS

1. In respect of the business other than the motor business, we have essentially assumed that the past inflationary patterns will be repeated in the future. While there is some sign of a slowing down in retail price inflation, most of the business concerned is international in nature and much of the inflation is of a societal nature and therefore is likely to carry on the same sort of trend.
2. In respect of the motor business, we have made some adjustment for changes in price inflation, this is spelt out in the section of the report as to how the adjustments were made. We have assumed that, in future, retail price inflation will fall to 6% at the end of 1983, and thereafter rise to 10% over a 4 year period. We discussed this assumption with the management of the company and it should be emphasised that the assumption is essentially theirs rather than ours.
3. As far as the exchange rates are concerned, we have assumed that the £/\$ relationship will be \$1.50 = £1.
4. We have allowed for extensive reinsurance recoveries and have assumed that they will be made in full.
5. We have conducted a separate analysis of the asbestos exposure. We have prepared our report on a manifestation basis, which we believe will produce a more conservative estimate of the company. The details are laid out in the section on Asbestosis.
6. We have observed a change in the claims settlement pattern of the motor business, due to the employment of a new motor manager, we have therefore assumed that claims will be settled more quickly in future, and that there will be a subsequent saving on the inflationary effect. We have made direct allowance for this, and the estimated saving is £2m. However, further research needs to be undertaken into this.
7. In respect of the agency business, we have been informed of a change in pattern in the proportions of business written. However, on the instructions on the general management we have implicitly assumed that this proportion has not changed the development pattern observed in the prior years is applicable to future years. We have not been in a position to test the validity or otherwise of this assumption as spelt out in the section under Data. We believe that the company should make increased efforts to obtain a proper data split. It is possible that the change in pattern could have distorted our estimates by up to £10m.

EXAMPLE CAVEATS

The following is an example of some of the caveats that should be put into a report on solvency or claims reserves:-

I XYZ have been asked to investigate the adequacy or otherwise of the outstanding claims reserves of ABC Insurance. This is to include the provision for IBNR reserves.

I have relied throughout on data supplied to me by ABC, as well as information provided to me by certain companies ceding business to ABC. Some of this information has been audited by ABC's auditors and some by the auditors of the ceding company. However, some of the information has not been audited. While we have no reason to believe that the unaudited information is inadequate, we have not independently verified it. We have also based our conclusions on discussions with various underwriters and claims personnel. I have also utilised audited reports and accounts of the company and for part of the business I have used some of the DOT returns. Our discussions with underwriting personnel included senior personnel with responsibility for each of the major classes of business, undertaken by ABC.

In coming to our conclusions we have assumed that certain reinsurance recoveries will be made, however, I have not made any attempt to verify the security of the reinsurers.

The analysis of reserves requires the estimation of the outcome of future contingent events. As such, there can be no guarantee that our estimates will prove adequate or not excessive. However in our opinion the methods and assumptions we have used, the reserves are reasonable under current circumstances.

EXAMPLE CONCLUSIONS

1. Much of the business written by the company is fairly short-tail. Historically there has been a record of prudent provision. In my opinion the level of redundancy in the reserves would be of the order of £4m. I would expect most of this redundancy to emerge during calendar 1983.
2. However, the reserving position of the employers liability account is more uncertain due to the longtail nature of the business. Run-off analysis suggests that the reserves are just about adequate. We are, however, somewhat concerned about the number of asbestosis claims being made. We have endeavoured to quantify the number of risks where there is likely to be significant exposure. It would appear that the potential exposure is not substantial, bearing-in-mind the reinsurance arrangement, in relation to the total reserves of the company.
3. We have had problems in analysing the aviation account and our conclusions must be treated with some caution, due to the significant changes in underwriting philosophy in the account over the period concerned. We have endeavoured, as far as is possible, to adjust for this in our analysis. This is spelt out in very much greater detail in the appropriate section. This section also includes analysis of the outcome of different differing assumptions. We would consider it unlikely that there is a substantial deficit in the reserves, and although possible variations would be significant in relation to the aviation account, they would not be especially material in relation to the company as a whole.
4. Our best estimates of the undiscounted reserves are shown in the table below:-

	Estimate £m	Company Reserve £m
Fire & Property	20.5	24.5
Private Motor	5.3	5.7
Employers liability	1.2 (a)	1.0
Aviation	<u>1.0</u>	<u>0.8</u>
Total	<u>£ 28.0m</u>	<u>£ 32.0m</u>

(a) Includes £0.2 for asbestosis.

The following is an indication of the sort of certificate required by some state departments.

ACTUARY OPINION

I, _____ (name and title of actuary),
am associated with the firm of _____ and
am a _____ (associate or fellow) of the _____ (Society of
Actuaries, or Casualty Actuarial Society). I have been involved in the preparation of
the annual statement of the _____ Insurance Company.

I have examined the actuarial assumptions and actuarial methods used in determining
reserves and related actuarial items, as shown in the annual statement of the company,
as prepared for filing with state regulatory officials, as of December 31, _____.

My examination included such review of the actuarial assumptions and actuarial
methods and of the underlying basic records and such tests of the actuarial calculations
as I considered necessary. These tests were performed on the basis of records certified
to by _____ (CPA) on _____ 19 _____.

The following items are certified to as defined below. (The actuarial test(s) performed
on each item must also be explained.)

In my opinion the amounts carried in the balance sheet on account of the actuarial
items identified above:

- (i) are computed in accordance with commonly accepted actuarial standards
consistently applied and are fairly stated in accordance with sound
principles
- (ii) are based on reasonable assumptions, consistent with those used in
computing the corresponding items in the annual statement of the preceding
year-end, and are fairly stated.

Signature of Actuary

Note the reference to commonly accepted actuarial standards.

SAMPLE METHODOLOGY

For the agency business we have analysed the development of premiums and claims incurred separately. We have simply taken a simple average of the development factors, rejecting ones that seem to be particularly unusual, due to the data distortions which were pointed out to us. For the purposes of this exercise we have included in our definition of IBNR reserves, adverse or overall development on case estimates. We have not investigated in much detail the premium development as we have checked our results using expected loss ratio techniques described below and consequently errors in estimates of the ultimate premium income have a smaller impact on the overall IBNR reserve.

I have used a wide variety of weighting techniques in respect of claims incurred pattern, particularly in the case of the agency business, and have endeavoured to avoid some of the distortions of the change in the mix of business. In doing this we have paid more attention to the later years, as well as supplementing the company's development factors with other factors, of which we are aware.

I have also performed the same calculations for the more recent underwriting years, but have only used this as a guide to likely ultimate loss ratios. I have also projected the loss ratios to ultimate, using similar techniques. For the more recent underwriting years, I have used this information, together with general background information as to overall market trends, to select an estimated loss ratio.

I have used the development factors to calculate the expected unreported losses as a percentage of the ultimate total. I have then applied these percentages to the expected ultimate losses based on my estimate of the ultimate premium. This then provides an estimate of the IBNR claims. I have then added this estimate to the incurred claims to obtain the estimated ultimate claims values. The split between the two methods varies according to the type of business. In general the longer the tail the more years have been reserved using the expected loss ratio technique.

The precise details of estimated loss ratios and the outlying calculations as shown in the various Exhibits. The Exhibits themselves are largely self-explanatory, together with the accompanying notes.

The expected loss ratio technique that we have used is one that was originally developed by R Bornhuetter and R Ferguson of the General Re and are described in

much more detail in a paper published in the Proceedings of the Casualty Actuarial Society 1972.

REINSURANCE METHODOLOGY AND PRESENTATION OF RESULTS

Complex, sophisticated methods are out of place where one is dealing with data which contains the type of distortions described above. An incurred loss triangle for, say, 'Medical Malpractice Excess of Loss' would probably contain a mixture of business written flat rated and burning cost, claims made and losses occurring, indexed and non-indexed, high layers and working layers. The differences between these types of business are more significant than the differences between medical malpractice and other professional indemnity classes. Faced with such heterogeneity, sophisticated methods would only serve to obscure ones understanding of the underlying development.

Probably the best approach is to break down the data into sensible groupings and to establish model development factors for premiums and claims using a basic chainladder, but with adjustments to cater for the peculiarities of the categories being modelled.

It is necessary to use an underwriting year rather than an accident year analysis because reinsurers do not usually have details of all individual losses and it is virtually impossible to calculate a UPR on a reinsurance account. The underwriting year analysis leads to a premium IBNR as well as a claims IBNR.

The above method is normally suitable from about the second development year. Within the first two years the individual development ratios are usually too variable for the chainladder method to be applicable and one needs to estimate the likely loss ratios by looking at the trend in the previous years' estimations and allowing for known differences, such as large losses, changes in business, market competitiveness, etc.

It is very important to consider whether anticipated underwriting losses should be funded during early development years by applying the estimated ultimate loss ratios to premiums booked to date, or to estimated ultimate premiums. The prudent approach would be to use booked premiums for classes anticipated to make an underwriting profit and estimated ultimate premiums for classes expected to make an underwriting loss. (This assumes that the company accounts are on a one year basis. On a three year accounting basis one could argue that no loss ratios of less than 100% should be applied until the third year; however, it is debatable whether this rule should be applied to individual classes or to the aggregate of business within an open year).

An example of a useful form of presentation of results is attached. A separate results analysis should be produced for each modelled class and the actuary should comment on the reasons for the more significant items of surplus/deficiency shown.

EXAMPLE - SURPLUS/DEFICIENCY ANALYSIS

(\$'000 31/12/83 EXCHANGE)		1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	TOTAL 1980 & PRIOR
A/C YEAR												
PREMIUM B/F		2437	3035	3260	4705	6628	7936	12669	16271	15968	19100	92009
PREMIUM C/F		2439	3030	3261	4723	6593	7947	12659	16271	15641	19571	92125
REVENUE PREM.		2	-5	1	18	-45	11	-10	0	-327	471	116
PAYD CLAIMS B/F		1450	2182	2475	3330	5903	6482	8184	6678	6508	7584	50776
PAYD CLAIMS C/F		1542	2290	2654	3595	6432	7113	8995	7579	7480	9493	57173
REVENUE PD. CLAIMS		92	108	179	265	529	631	811	901	972	1909	6397
O/S CLAIMS B/F		311	378	449	681	1894	2287	4477	3611	5418	10235	29741
O/S CLAIMS C/F		182	364	461	631	1613	2044	3924	3003	4823	8753	25778
O/S MOVEMENT		-129	-14	12	-50	-281	-243	-553	-608	-595	-1502	-3963
IBNR B/F		346	723	774	1500	1712	3228	5120	6306	7463	7037	34209
IBNR C/F		320	645	600	1274	1410	2723	4530	5785	6800	6937	31025
IBNR MOVEMENT		-26	-78	-174	-226	-302	-505	-590	-520	-663	-100	-3184
SPECIAL RESERVES B/F		250	250	250	250	100	100	0	0	0	0	1200
SPECIAL RESERVES C/F		500	500	500	500	150	150	0	0	0	0	2300
		250	250	250	250	50	50	0	0	0	0	1100
SURPLUS/(DEFICIENCY)		-185	-271	-266	-221	-41	78	322	227	-41	164	-234
PD.LRx B/F		59.4	71.8	75.9	70.7	89.0	81.6	64.5	41.0	40.7	39.7	55.1
PD.LRx C/F		63.2	75.5	81.3	76.1	97.7	89.5	71.0	46.5	47.8	46.5	62.0
INC.LRx B/F		72.2	84.3	89.6	85.2	117.6	110.4	99.9	63.2	74.6	93.2	87.5
INC.LRx C/F		70.6	87.5	95.5	89.4	122.2	115.2	102.0	65.0	78.6	93.1	90.0
ULT.LRx B/F		96.7	116.4	121.1	122.4	144.9	152.4	140.3	101.9	121.4	130.1	125.9
ULT.LRx C/F		104.3	125.3	129.2	127.0	145.9	151.3	137.8	100.5	122.1	128.5	126.2

SECTION IV

SOLVENCY REPORTING

For a company writing an existing block of business then in most cases the same sort of points need to be covered in a solvency report, as in a claims reserve report, in order to assess the adequacy of the existing reserves to see what additions or deductions are available to the explicit solvency margin. Indeed if one is reporting merely on whether a company can meet statutory solvency margins then, apart from the fairly trivial calculation of what those statutory solvency margins are, there is not much further to add. However, in most cases where an actuary is required to report on solvency of companies he is going to include recommendations for capital levels over and above the statutory minimum. The structure and scope of the report covering data, methodology, presentation of results, would all be similar for solvency as for claims reserving. However, the following additional areas would need to be covered.

1. Type of business written

Certain lines are more predictable than others and so require less capital. Essentially, this would be a function of the standard deviation of the results of the line. An obvious example is the comparison of windstorm catastrophe damage against household contents insurance. Per unit of premium a company would need a higher capital requirement for the former.

Any degree of uncertainty in the claims reserves must be taken into account. To this extent it may be reasonable to assume that longer tail lines would require higher reserves than shorter tail lines, but it is appropriate to take investment income into account in considering the impact of the degree of uncertainty.

2. Level of retentions

On a particular block of business this has a significant impact on the capital requirements. This needs to be considered in some detail, both as to the level of retention, the type of reinsurance e.g. a burning cost cover will only spread losses, whereas a low level stop loss cover with a first class reinsurer could mean that even statutory solvency margins requirements were excessive.

3. **Reinsurance recoveries**

The solvency of the reinsurer is also a matter of some importance.

4. **Need for future reinsurance**

Reinsurer's attitude to the future may be a factor. In many cases catastrophe covers can be arranged on an annual basis which means that for a policy issued on the 1st July, the terms of the cat cover for the latter half of the policy would not be known at the time of issuing the policy. If it were felt that market conditions could change, then this is something that explicit solvency margins might be there cover.

5. **Investment policy**

This is clearly an important factor, the company investing wholly in equities will need a much higher solvency margin than one investing in short term fixed interest securities.

6. **Currency problems**

In most cases these companies will endeavour to match the currency. However, in many lines of business this is not possible, partly because of lack of suitable investments in the appropriate currencies, or because it is not known what currency it is appropriate to match in. Examples of the latter would be certain forms of treaty business, where only approximate splits of the business can be obtained, or a class such as marine hull where although the policy may be denominated in \$ actual claims could well be settled in a number of currencies, depending on where the ship is dry-docked.

7. **Marketing Implications**

Where relevant the actuary should consider this. If the line of business is low risk it may be that very low conventional ratios may be appropriate from an actuarial viewpoint but brokers may require more conventional ratios.

8. Deferred Tax

In some cases it may be appropriate to add deferred tax to capital and surplus for solvency purposes, as claims reserve deficiencies are underwriting losses are probably tax deductible but it is possible that the tax is payable and not recoverable when the losses emerge.

Techniques for Solvency Analysis

Some form of simulation approach is probably the most appropriate if a company is wishing to write a complicated book of business and wants a detailed analysis of its solvency requirements. This could involve setting up a model office which includes investment fluctuations, other retentions and also makes allowances for parameter uncertainty. An approach to this could be that described in the paper by John Ryan to the 1984 Australian Congress, headed 'Application of Simulation Techniques to Solvency Testing for a Non-life Office'.

In many cases, however, it is not solvency in the sense of ruin probabilities that is the issue in most forms of reports to management. Usually they are concerned about the stability of the results, or avoiding significant financial problems which would involve significant changes in operation rather than solvency. This, clearly, comes in the scope of reporting of capital requirements, and it may well be that the actuary is required to write more reports about this than about solvency. However, it is of less concern from a statutory point of view.

In some cases sophisticated techniques are not appropriate. Levels of accumulation and MPL's can almost be more important than any other aspects for certain companies. It is also important that results are comprehensible to management and not couched in complex mathematical language.

SECTION V

ACTUARIAL REPORTING & CERTIFICATION IN OTHER PARTS OF THE WORLD

The following provides some background material. The object has been to choose material that reflects the background thinking rather than the up to date position.

USA Appendices 1-3

The American Academy paper is included to show some of the problems prior to certification. This is followed by 2 references to the up to date certification position which are largely factual.

Canada Appendix 4

This consists of a possible amendment to the Canadian legislation though it has (together with other amendments unrelated to reporting) been shelved.

APPENDIX I

STATEMENT 1979-6

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POSITION PAPER
OF THE
AMERICAN ACADEMY OF ACTUARIES
CONCERNING PROPOSALS

- (1) TO REQUIRE STATEMENTS OF OPINION ON CASUALTY LOSS RESERVES
ON THE FIRE AND CASUALTY BLANK

AND

- (2) TO RECONSIDER THE CURRENT STATEMENT OF OPINION ON THE LIFE
AND ACCIDENT AND HEALTH BLANK

BY

NAIC BLANKS (A1) SUBCOMMITTEE

March 21, 1979

Nature of Actuarial Work

The determination of reserves for all lines of insurance involves the evaluation of current financial values for future contingent events. The cornerstone of the discipline of actuarial science involves placing financial values on future uncertainty. The training and experience patterns for actuaries make them uniquely qualified to perform such determinations. Other, more extensive, submissions on this subject by the Academy have fully documented the training received by actuaries.

Nature of Statement Being Sought by NAIC

Confusion currently exists about the nature of the statement being sought by the NAIC on the Fire and Casualty Blank. There are fundamental differences between a statement of professional opinion rendered in connection with the original determination of the reserves and an opinion by an independent auditor.

The former involves a statement by a qualified professional who is generally the preparer of the reserves concerning the adequacy of those reserves and the professional standards used. In other words, the reserve preparer is asked to "stand up and be counted" as to the quality of his or her original work and to assume personal and professional responsibility for it. On the other hand, a "review" or "audit" function involves an appraisal by an independent auditor as to the reasonableness of the firm's financial statements, i.e. that certain accounting standards were followed.

The threshold question that must be decided is which of these very different kinds of opinion is more appropriate for the Fire and Casualty Blank.

Introduction

The agenda for the April, 1979 meeting of the NAIC Blanks (A1) Subcommittee includes three separate proposals involving statements of opinion on casualty loss and loss expense reserves on the Fire and Casualty Blank. These three proposals have been sponsored by the NAIC Financial Condition Examination (A5) Subcommittee, the American Insurance Association, and the National Association of Independent Insurers. Although there are some similarities among these proposals, major differences among them exist. It is assumed in this position paper that the details of these three proposals are known to the reader. Also, on the agenda is the suggestion that the statement of opinion required on the Life and Accident and Health Blank be reconsidered to possibly include a requirement that the actuary rendering the opinion be independent of the insurer. The current provision, which has been in effect since 1975, does not include an independence requirement.

Endorsement

The Academy endorses the general concept of requiring a statement of opinion on casualty loss reserves. The existing requirement on the Life and Accident and Health Blank has worked well and has produced meaningful assurances on that blank. Recent experience indicates that a similar program for the Fire and Casualty Blank is appropriate and desirable.

We believe that the NAIC should require a statement of professional opinion, rather than an audit on casualty loss reserves for the following reasons:

- The history of the statement required on the Life and Accident and Health Blank clearly shows that the intention was to have a qualified professional who is generally the preparer of the reserves sign off on his or her original work. We believe that the rationale on the Fire and Casualty Blank is no different.
- Such a statement provides new and different assurances to state regulatory officials. If the opinion involved is to be an audit, then it overlaps much of the work already done by state examiners and CPA audits (where in existence).
- The fact that an opinion is being sought concerning one particular statement item of critical importance indicates that a special opinion is intended. If an audit were intended, it would be logical to apply it to cover the entire financial statement.

Independence

Once the basic decision above is reached, the debate over independence resolves itself. If a statement of professional opinion on the original determination of the reserves is intended, then independence is not necessary. If an audit is intended, then independence is generally acknowledged to be a requirement.

It should also be noted that independence is not a requirement imposed in other areas of actuarial practice. The statement of opinion on the Life and Accident and Health Blank has already been cited. A second example is the statement required of an enrolled actuary on a private pension plan under the Employee Retirement Income Security Act of 1974 (ERISA). The required actuarial statement must include an opinion by an actuary, who may be an employee of the plan sponsors or an outside consultant, but in neither event is it required that he/she

be independent. In both of these cases, the lack of an independence requirement has not resulted in any lessening of the objectivity and professionalism of the actuarial statements provided.

Recognition of Accountants

If the NAIC decision is to have a statement of professional opinion on casualty loss reserves, then direct recognition of the AICPA (as contained in the (AS) proposal) is inappropriate. The training necessary to become a CPA is not, in and of itself, sufficient to qualify an individual to determine insurance reserves.

If the NAIC decision is to require an independent audit, then, of course, the AICPA should be recognized. It should be noted that, in auditing procedures, the AICPA itself recognizes that certain highly technical and specialized financial values require special expertise (see AICPA Statement on Auditing Standards No. 11 - "Using the Work of a Specialist").

It should also be noted that a growing number of states are requiring CPA audits of statutory statements. If the NAIC also requires an audit on casualty loss reserves, the net effect in many cases would be to have two audits and no statement of professional opinion, a result which is quite illogical.

Supply of Specialists

Concern has been expressed over the supply of qualified specialists for casualty loss reserves. We believe that the existing number of Members of the American Academy of Actuaries, together with others deemed qualified by the insurance commissioners, will be sufficient to

meet the needs of any of the proposals. It should be noted that the large majority (conceivably all) individuals who currently determine casualty loss reserves (including CPA's with experience in this area) will be able to render opinions since provision is made for qualification of any person who has demonstrated actuarial competence to the satisfaction of the insurance commissioners. Over time, the insurance commissioners may choose to tighten requirements for those eligible to become specialists in the future as the supply of more highly qualified individuals increases.

Conclusions - Fire and Casualty Blank

AIA Proposal

Of the three proposals before the Subcommittee, this proposal appears to be the best for the reasons cited above. The Academy recommends its adoption.

(A5) Proposal

This proposal appears to confuse a statement of professional opinion and an audit. The recognition of the AICPA and the independence requirement are inappropriate for a statement of professional opinion. The independence requirement will involve an additional cost impact on companies.

NAII Proposal

We have no objection to this proposal, if the NAIC wants a much more limited program than the others.

Conclusions - Life and Accident and Health Blank

The current program for the Life and Accident and Health Blank is working well and no need for change has been demonstrated. The addition of an independence requirement would be inappropriate for the reasons cited above. The fact that the program has worked well for health insurance, as well as life insurance, indicates that the AIA proposal is likely to succeed for other casualty lines as well.

APPENDIX 2BREAKDOWN OF US CERTIFICATIONS

From the Actuarial Review, November 1982

SCORECARD

To the Actuarial Review:

I thought the readers of the Review might be interested in a compilation of the loss reserve certifications that the California Department of Insurance required for the first with the 1981 annual statements. The requirement applied only to California domestics that wrote Schedule P lines.

A loss reserve specialist who certified more than one company in a group was only counted once.

Actuaries	<u>CAS</u>	<u>SOA</u>
1. Company employees	16	0
2. Consultants	20	2
Non-Actuaries		
1. Company employees		41
2. Consultants		4

Edward W. Ford

APPENDIX 3**CERTIFICATION OF LOSS RESERVE SURVEY FOR
THE 1982 FIRE AND CASUALTY BLANKS**

Of the 55 insurance departments surveyed, 51 departments responded.¹ Nine States indicated that they require a "loss reserve specialist" to certify the fire/casualty blank for 1982. The states, enactment citations, and their requirements are as follows:-

STATE:	ENACTED:	REQUIRED OF:
California	Department Order (Bulletin No. 81-5) dated July 28, 1981	All companies doing business in the state
Illinois	Department Order dated September 30, 1980	Domestic companies only
Kansas	K.S.A. 40-225 and department notification	Domestic companies only
Maryland	Department Order dated November, 1980	Domestic companies only
Missouri	On a trial basis by department notification	Domestic companies only
New Jersey	Department Order dated July 16, 1982	Domestic companies and foreign companies domiciled in states requiring loss reserve certification of foreign companies
New York	Department information letter dated November 24, 1980	Domestic companies and foreign companies domiciled in states requiring loss reserve certification of foreign companies
Texas	Department notification	All companies licensed to do business in the state
Wisconsin	Department Order dated October 13, 1982	Domestic companies only

This list represents a change from the 1981 survey. In 1981, Delaware responded that it did require loss reserve certification for domestic companies only.¹ Also in 1981, Idaho required loss reserve certification. In 1982, Idaho responded that the State department was considering adopting the requirement. Nevada responded that it did not require loss reserve certification, but added that it did only on a retaliatory basis. New Mexico is considering adopting the requirement. Wyoming is reviewing the requirement as well.

1. Four departments did not respond to the 1982 survey: Colorado, Delaware, Indiana and Virgin Islands.

APPENDIX 4**CANADIAN PROPOSAL FOR CERTIFICATION**

The following is part of a proposed change of Canadian Insurance legislation. This has now been postponed but the reasons are nothing to do with the certification issue.

Section 102 of the Act would be amended to require each company to submit a special report signed by an actuary, stating the actuary's opinion that the provision for outstanding claims represents a fair and reasonable estimate of the amounts that will be required, together with amounts receivable from reinsurers, to settle the claims in full. This amendment would also permit the Superintendent to accept in lieu of an actuarial report, a report signed by a person who is qualified as an auditor or any other person who has relevant training and experience. It would be intended that this authority would be exercised by the Superintendent if he is satisfied that there is inadequate actuarial expertise to prepare these reports for all companies. This report would also be required to state an opinion concerning the likelihood of recovery of amounts receivable from reinsurers.

A further amendment would require a similar report concerning the adequacy of policy reserves (under present practice, these are unearned premiums less an allowance for unamortized acquisition expenses) to cover claims expected to fall due in the unexpired period of the policy together with all related expenses. These new requirements would not apply to non-cancellable accident and sickness policies or to reserves for instalment claims under such policies since actuarial reports are already required in such cases.

These sections requiring special reports on claims reserves and policy reserves would come into force on proclamation. This would provide time to arrange the necessary expertise.

APPENDIX 5**ACTUARIAL CERTIFICATION IN OTHER PARTS OF THE WORLD**

In Italy reserves are required to be certified by an actuary, who is not an employee of the company. He is to be appointed by, and report to the auditors and not directly to the company. Each company must change its auditing firm, including the actuary, every three years. The certification does not cover all the non-life classes transacted by the company, but only those identified by the actuary and the auditors as high risk areas. The selection of each area has to be remade each year and it is expected there will be some rotation, though each year all the important classes will be included. The investigation is to apply to the gross returns.

In Finland, the actuary annually carries out reserve calculations following Ministry schedules. As a rule a representative (actuary or specialist inspector) is present during the audit and looks at the calculations and their source data, supplying his opinion to the auditors and the company, as to whether he is satisfied with the reserves or not. This statement is then included in the public report of the auditors. A company is allowed to produce much more detailed reserves and models and Ministry schedules are regarded as general standards only.

In Bermuda there is a requirement that a company obtain a certification by a "loss reserve specialist", where more than a certain percentage of its business is deemed to be longtail, which is mainly medical malpractice and products liability. Strangely, marine hull is not included in this. A loss reserve specialist is somebody approved by the Ministry. The vast majority of insurance companies in Bermuda do not require this certification.