1998 General Insurance Convention & ASTIN Colloquium

YEAR 2000 GISG WORKING PARTY

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1 INTRODUCTION

- 1.1 In this paper we aim to investigate the ramifications of the millionnium bug for insurance enterprises. We describe, briefly, the millionnium and similar date related bugs, their possible business and economic consequences and the time-frame over which the consequences of date related bugs may emerge. We go on to discuss the coverage issues the millionnium bug raises and underwriting and reserving issues. In the appendix we consider the possible impact for each major line of business.
- 1.2 The paper focuses principally on UK policy forms, but we imagine similar coverage issues will arise in other jurisdictions.
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2 THE MILLENNIUM BUG AND POTENTIAL CONSEQUENCES

The millennium bug

- 2.1 In this paper we have used the term millennium bug to refer loosely to a number of date related computer problems that are likely to arise in the next few years. The best known of these is the year 2000 ("Y2K") bug, which stems from the fact that computer programs often use a two digit code for the year component of dates and the ambiguity of the date "00" may lead to incorrect calculations. This bug may affect embedded microprocessors as well as computer programmes. Other potential date related problems include the dates '1.1.99' and '9.9.99' which have been used in some computer programs as flags rather than as normal dates, so these programs may either refuse to accept these values, or behave abnormally when confronted with them. addition to these dates, the year 2000 is a leap year, and some systems may not recognise 29.02.2000 as a valid date. Problems may also arise on 21/22.08.99 owing to difficulties with the global positioning system ("GPS"). The GPS network clock counts in weeks, in binary, and will exhaust the number of weeks (2¹⁰) its internal clock can record on 22 August 1999.
- 2.2 These date related bugs are endemic. Virtually all cars, white goods and brown goods contain computer microprocessors and virtually all commercial data contain date fields. Virtually all of the developed world's infrastructure relies on computer controlled systems.

Consequences of the millennium bug

- 2.3 A hierarchy of consequences stemming these date related bugs can be envisaged. The direct results could include:
 - Computer programs and microprocessor controlled machines failing to operate correctly and possibly failing to respond to commands and shutting out the user.
 - Computers generating inappropriate results. For example, computers calculating interest as if debts are 100 years

overdue, stock control systems calculating the age of stock as 100 years etc.

- Inappropriate implementation of fail-safe routines in computer controlled equipment. For example, lifts may refuse to move if they 'believe' they are overdue for safety services, bank vauits may refuse to open on days they 'think' are weekends. Some of these may be immediately obvious but some will be latent with problems not becoming apparent for many years.
- Loss of data. Data may actually be deleted by automatic housekeeping routines not recognising files as current. Data may also be rendered non-accessible (ie effectively lost, at least in the short term) if the computer systems used to access it fail owing to date related problems.
- 2.4 The direct consequences of the millennium bug may result in computer controlled production processes grinding to a halt, or being shut down because of safety concerns. Company financial records of debtors may be deleted, or become non-accessible, making billing impossible and debt collection difficult.
- 2.5 In addition, there are likely to be a variety of secondary and tertiary consequences. Businesses may be exposed to losses because of a failure of suppliers to deliver goods owing to upstream computer/microprocessor failure. Downstream computer problems could also block further processing and/or distribution routes resulting in lower sales. Further, even businesses who have resolved their own millennium bug problems will be exposed to production losses and/or extra costs if the physical infrastructure (for example power supplies) fail. If telephone systems falter so that connections become haphazard, companies, particularly telesales companies, will suffer cuts in sales volume. Anything which results in significant falls in sales volume may well give rise to cash flow difficulties, and potential business failures. There may also be knock-on problems stemming from problems in the financial sector infrastructure. Any significant degree of problems in the banking sector could rapidly lead to commercial chaos as cheques bounce, direct credits and debits fail and companies suffer cash flow problems.

- 2.6 It is conceivable that economic dislocation may trigger/worsen an economic recession, with drops in companies' turnovers, profits and share prices, increased unemployment, bad debts and company bankruptcies. There are implications for insurers at both the micro and macro levels.
- 2.7 There has already been a number of examples of systems failing to cope with a '2000' date. The first insurance claims have already been received. In the run up to the year 2000, there is likely to be a steadily increasing trickle of problems manifesting themselves, quite possibly this will be supplemented by spikes of claim notifications as the critical dates noted above pass. Over the year end 1999/2000 it is likely that many computer programs and microprocessors will fail. Other failures, or their consequences, will only manifest themselves later, when a program or subroutine is first run after the year 2000. Hence it is quite possible that some problems may lie dormant and may not materialise for several years.

Infrastructure problems

- 2.8 It is widely reported that there is considerable potential for widespread infrastructure impairment or failure as a result of the millennium bug. Systems mentioned as being particularly vulnerable include power generation and distribution systems, telecommunications, railways, water distribution and sewage systems, traffic control systems and computer or microprocessor controlled hospital equipment.
- 2.9 Infrastructure failures may well take considerably longer than normal to repair in the aftermath of the millennium bug, since the materials and people needed to repair them may well be in short supply, given a greatly increased demand. Public sector organisations may well be out-bid by private sector ones in acquiring the people and resources to carry out repairs.
- 2.10 Infrastructure structure problems caused by the millennium bug could aggravate "normal" insurance losses in a number of ways including:

- higher claim costs if the actual incident is more severe than would have been the case in the absence of millennium related infrastructure impairment (for example fire losses may be increased if the water pressure is inadequate or if communications fail)
- higher claim costs if the price of scare resources increases
- poorer general economic and financial prospects.
- 2.11 In addition to problems that may be experienced with physical infrastructure projects, insurers also rely upon the banking and securities industries' systems and communication networks. These are so critical to these companies' operations that both the companies and their regulators in the UK and US have ensured that year 2000 compliance is high on their agendas. We understand recent (ie early summer 1998) test drives of post 2000 dates in trading between New York based securities houses were successful.
- 2.12 It is possible that insurers may be more exposed to the risk of their brokers' rather than their bankers' systems failing. We understand that the ABI is maintaining a database of the compliance status of UK brokers. Insurers and brokers will need to test their data links for year 2000 compliance once each firm's main systems are compliant.
- 2.13 Problems may also be more likely to arise in continental Europe where the impending introduction of monetary union may well have diverted attention and resources from the year 2000 issue.

Discussion of wider impact of the problem

2.14 It is possible that the effect of Year 2000 problems on financial markets will result in a significant fall in investments values early in the Year 2000 (or in the run-up to the 1999 year end). Such falls may be widespread or they may be restricted to a relatively small number of sectors of the investment market. Another possibility is a substantial change in interest rates in response to such problems. It is therefore possible for both the asset and liability side of an insurer's balance sheet to be affected.

- 2.16 It is likely that year 2000 problems will not be totally independent and will be concentrated in certain industries or countries. It is important for insurers to appreciate the potential for aggregation of year 2000 losses.
- 2.17 The failure of components caused by year 2000 problems in one industry area might well have a knock-on effect on suppliers to that sector and purchasers from that sector. In turn this might cause further problems in our complex production chains thus gearing up the impact of problems.

3 ADDRESSING THE MILLENNIUM BUG

- 3.1 The millennium bug has been widely publicised across the world in recent years. Indeed recent research suggests that 98% of businesses in the UK are aware that problems may arise as a result of the millennium bug. Many organisations are investing large amounts of money in order to address the potential problems. This section considers how those businesses which have decided to act are addressing the problem and the cost of this compliance work. This section does not consider the specific issues faced by insurers as risk carriers which are discussed in section 4.
- 3.2 The first stage of a compliance project is for senior management to accept that a potential problem exists and to establish a year 2000 programme. This programme will normally commence by identifying every system in service which could be affected including both internal and external software and hardware.
- 3.3 Each item identified will then need to be assessed for year 2000 compliance. This may involve a detailed review of any code in addition to extensive testing of the effect of dates beyond 1 January 2000. An assessment needs to be made of the resources required to make each item compliant and the consequences of non-compliance. The consequences of non-compliance can be used to develop an order of priority for compliance work. External suppliers of software or hardware would also be contacted to assess the compliance of their products.
- 3.4 A number of approaches may be followed to making a system or service compliant including:
 - replacing the system or service by a compliant version
 - amending the underlying code.
- 3.5 In some cases it may be decided that the cost of compliance is too high relative to the value of the system and the system may be abandoned.

- **3.6** Following the implementation of the compliance measures, detailed testing of compliance is required. Both internal and external systems should be considered, even if the supplier has given assurances on compliance, because the interfaces between systems may generate compliance issues.
- 3.7 Contingency measures will need to be considered to address the possible effects of non-compliance of the company's systems or those of its suppliers or customers. These measures should address both known non-compliance and possible unexpected non-compliance.
- 3.8 Many organisations have also requested assurances on compliance from all suppliers including those providing non-computer related goods. Organisations wish to ensure that suppliers will continue to deliver after 1 January 2000.

The cost of compliance

3.9 Many organisations are incurring considerable costs addressing their year 2000 issues. A recent IT expenditure survey by Kew Associates estimated that UK based companies and the public sector spent approximately £2.7 billion in 1998. Many companies have announced their expected costs of year 2000 compliance. The following table shows the estimated compliance costs for a number of major companies.

	Company's estimated compliance cost £m
Unilever	300
Zeneca	40
Barclays	250
National Westminster	150
BT	300
British Airways	100

- 3.10 The total compliance cost for FTSE100 companies has been estimated at £5 billion in a recent Reuters survey. The total cost to UK industry has been estimated at between £15 billion and £50 billion.
- 3.11 A number of studies have been published which estimate global compliance costs. Two studies have attempted to estimate the effect of millennium compliance on worldwide economic growth over the next few years. Both studies suggest a reduction in the growth in the world economy of around 0.3% per annum owing to millennium compliance. The global cost of millennium compliance has been estimated by a number of commentators as between \$300 billion to \$600 billion although some commentators suggest even higher estimates.

4 THE POTENTIAL EFFECT OF THE MILLENNIUM BUG ON INSURANCE POLICIES

- 4.1 Section 2 described the potential damage and destruction which may be caused by the millennium bug. It is likely that businesses suffering losses will seek to recover these losses from their insurers. The potential for insurance claims varies greatly by class of business. The appendices to this report discuss the potential year 2000 exposures for a number of major classes of business.
- 4.2 The effect of year 2000 on insurers will depend on whether insureds are able to call on their insurance policies. Insurers have a number of possible defences to coverage. We discuss below the following areas whereby coverage could be denied.
 - fortuity of the event
 - mitigation
 - whether a loss constitutes property damage
 - exclusion clauses
 - utmost good faith
 - warranties.

Fortuity of the event

4.3 The judgement in the case Prudential Insurance Company v Inland Revenue Commissioners 1904 sets out one of the key characteristics of an insured event:

"There must be uncertainty whether the event will happen or not, or if the event is one which must happen at some time, there must be uncertainty as to the time at which it will happen."

This rule was developed further by the Court of Appeal, in Soya GmbH v White (1982), in which the Judge thought the defence of certainty was only valid if the certainty was known, or should have been known, to the insured. A further case is that of Miss Jay Jay (1987) in which the court of Appeal ruled:

"even if the occurrence of a particular unwanted event, which may or may not occur, is a readily foreseeable risk, the event may still be properly regarded as accidental when it does in fact occur".

- 4.4 It is inevitable that there will be disruptions if companies do not reprogram their software to make it year 2000 compliant. Such disruptions will occur as soon as dates beyond 31 December 1999 start to be generated or handled by the software. It follows therefore that if the only consequence of the non year 2000 compliance is the corruption of data in a computer system, or a machine with an embedded chip becoming moribund, this may be seen to be inevitable and, thus, not fortuitous. However, the later cases indicate that the defence of lack of fortuity may, at least in some circumstances, be open to challenge.
- 4.5 If an additional loss is caused as a result of non compliance, for example, if the security system fails to work and property is subsequently stolen, it appears the general consensus is that such a loss is unlikely to be regarded as inevitable and may therefore be covered.
- 4.6 A further consideration is that a loss will not be fortuitous if it was as a result of wilful misconduct of the insured occurring at any time during the insurance period. For example, if the year 2000 audit was carded out and a series of actions identified to achieve compliance, the deliberate policy of not taking those actions because the steps were too expensive may be deemed as witful misconduct.

Mitigation

4.7 insureds are under a general duty or obligation to mitigate any loss and to take reasonable steps to protect their property from further damage. A recent case (Yorkshire Water v Sun Alliance) established that in the UK the cost of precautionary mitigation is probably not recoverable from insurers. In the case of the year 2000 issues, there is a responsibility on organisations to carry out precautionary mitigation by way of a review or audit to establish the actions necessary to meet compliance, and then to implement those actions.

- 4.8 Additionally, the responsibilities of directors and officers of organisations is such that they have a duty to safeguard the well-being of an organisation and its assets. Furthermore, the accounting profession has issued a statement through the Urgent Issues Task Force (UITF 20) that comment should be made in the director's report or operating financial review, as appropriate, on action taken by the company regarding year 2000 matters.
- 4.9 This sends a clear message that organisations need to ascertain the risk to their business of year 2000 compliance and address it in a timely fashion before it arises. This is of some concern considering the significant number of organisations in the UK who have only just started, or in some case failed to start, the process. It seems likely that a large number of these will fail to achieve satisfactory compliance by 31 December 1999.

Property Damage

- 4.10 Some policies cover property damage and others cover other loss consequent on property damage. We understand there is very little legal precedent in the UK as to where the boundaries of "property damage" are. It is our understanding that where a policy does not define property, the term will be taken to mean tangible property. Where data is stored on magnetic media, erasure of that data may be considered property damage, but it is more difficult to construe non-functioning software as property damage.
- 4.11 The scope or coverage of property damage may prove a major issue in view of the potentially large number and scale of losses that could arise.

Exclusion clauses

4.12 As we can see from the above, there is great potential for legal cases to emerge as claims are notified relating to year 2000 issues. Many insurers may choose to limit their exposure in this area by way of incorporating an exclusion clause in their policies. However, it can be anticipated that not all exclusion clauses will be as watertight as their authors intended and we are likely to see these tested through the courts. In addition, the imposition of an

exclusion clause on the renewal of a claims made policy may well lead to the submission of a lengthy list of precautionary advices to the previous year's policy.

- 4.13 Exclusion clauses need to be clear and unambiguous to cover direct and indirect losses arising from non-compliance with year 2000 issues but must also comply, in the UK, with the Unfair Terms in Consumer Contracts Regulations 1994.
- 4.14 Personal lines insurance in the UK is subject to the Unfair Terms in Consumer Contracts Regulations 1994. These stem from EU law. The regulations provides that:

"1. An unfair term in a contract concluded with a consumer by a seller or supplier shall not be binding on the consumer.

2. The contract shall continue to bind the parties if it is capable of continuing in existence without the unfair terms.

4.15 The Regulations contains illustrative examples of where unfair contract terms may be found to exist, including,

"irrevocably binding the consumer to terms with which he had no real opportunity of becoming acquainted before the conclusion of the contract."

- 4.16 It is conceivable that some of the current exclusion clauses being written in relation to year 2000 issues could be considered unenforceable under the Regulations. For example, the extended warranty contracts where a year 2000 exclusion could, at least from the consumer perspective, thwart their intent to provide a guarantee that they would enjoy the use of the product for the life of the extended warranty insurance, could well be most at risk.
- 4.17 Companies selling personal lines policies who intend to rely on year 2000 exclusion clauses to limit their exposure from year 2000 losses should also carefully consider the extent to which consumers' attention must be drawn to these new clauses in the contract in order that they are binding.

Utmost Good Faith

4.18 Insurance contracts are contracts of utmost good faith. The failure of insureds to disclose material facts when renewing a policy renders the policy voidable. How this principle will be interpreted is likely to depend on the insured concerned. For example, a computer expert may be expected to know more of the ramifications of the year 2000 than an ordinary businessman.

Warranties

- 4.19 Where a warranty is given by an insured, breach of that warranty discharges the insurer from all liability under the contract of insurance, after the date of the breach. It may be possible for insurers to incorporate warranties with regard to year 2000 issues onto their proposal forms, which are worded so that they form part of the contract of insurance.
- 4.20 Insurers will need however to make sure that all such warranties are unambiguous and that the party giving the warranty clearly understood that he was giving a warranty, if the insurer is to be in a position to rely on Courts upholding the warranty.

Other legal issues

- 4.21 There are many other potential legal issues surrounding the potential size of year 2000 claims. Indeed, many commentators predict that, measured by volume of litigation, year 2000 will be one of the most significant events of all time. There is huge potential for litigation by businesses which feel that they have suffered damage caused by other organisation's non-compliance. We have described below two other potential legal issues which could affect insurance claims. Undoubtedly, many other issues will arise in due course.
- 4.22 It may often be difficult to identify which party has caused a year 2000 related loss. Especially in the computing field, date handling cannot be isolated to a single product or application. For example, an accounting application utilising the underlying system date which is maintained by the hardware's real time clock could potentially have problems. What might otherwise be considered a

totally compliant accounting system could fail owing to the real time clock not recognising the year 2000 property. This raises the issue of identifying the correct responsibility for any claim that is made, and the difficulty to which system providers expose themselves when they give their customers or insurers warranties that their products are year 2000 compliant.

4.23 The last area we will consider as a potential legal problem is that of policy renewal. For policies written on a calendar year basis insurance and reinsurance contracts often incept at one minute past midnight on the date of commencement of the policy. This leaves a very short period of time (one minute) in which most types of ordinary claim will have a negligible likelihood of occurring. However, this is very different for year 2000 losses, as this one minute period is exactly the time when many events may occur. This is because the nature of the problem is that it is on the change over to the year 2000 (ie at midnight) that systems potentially are most at risk. Therefore, this one minute of non coverage could also lead to potential legal disputes.

5 UNDERWRITING CONSIDERATIONS

- 5.1 Insurers and reinsurers are potentially exposed to year 2000 related claims on a wide variety of classes of business. In many cases, these exposures relate to policies which have not yet been written. As a result, insurers and reinsurers have an opportunity to take underwriting action to reduce the impact of year 2000 claims on their accounts. Possible underwriting actions include:
 - imposing year 2000 exclusion clauses
 - encouraging insureds to address their year 2000 problem which may involve the insurer providing risk management advice
 - trying to avoid underwriting risks with significant year 2000 exposures or charging higher premiums for such risks.
- **5.2** The actions taken by underwriters to date vary between different companies, classes of business and territories. In some cases a combination of more than one of the above approaches is used. At the time of writing underwriters' approaches are developing rapidly as we move towards the start of 1999 when the volume of year 2000 exposed policies written will increase substantially.
- **5.3** We have set out below a discussion of how each of the three approaches set out in paragraph 5.1 have been used in a variety of insurance markets.

Exclusion clauses

5.4 Year 2000 exclusions clauses have been proposed by many insurance industry trade bodies and are currently being used by many insurers. In the UK, the Association of British Insurers ("ABI") has published suggested exclusion clauses for many classes of business. Insurers are free to decide whether such clauses should be included in their policies. A number of insurers have announced that they intend to include an exclusion clause in some commercial policies including public and products liability and property damage and business interruption "all risks" policies.

- 5.5 It also seems likely that exclusions will be imposed on many personal lines policyholders in the UK. The main classes of business for which some insurers have announced exclusions clauses are motor, household contents and extended warranty. However, the exclusion is only intended to relate to "direct" year 2000 losses. For example, if the ABS brakes on a motor car fail owing to an embedded chip failure on 1 January 2000 and the car collides with a tree, the insurer would pay for the damage caused by the collision and any bodily injuries but would not pay to replace the ABS brakes. Similarly, if a video recorder fails as a result of the millennium bug and causes a fire, the insurer would pay for repairing the video recorder.
- 5.6 In the United States, the Insurance Services Office has issued possible exclusion clauses which exclude losses caused directly by the millennium bug but allow indirect losses to be covered.
- 5.7 In the London Market the drafting of exclusion clauses has been undertaken by industry bodies such as the Joint Cargo Committee, The Lloyd's Underwriters Non-Marine Association and the Lloyd's Aviation Underwriters' Association. In the property market, insurers and reinsurers are imposing exclusions on some risks. Two main forms of exclusion are in use: an absolute exclusion and a more limited exclusion which excludes electronic date recognition losses but writes back in property damage for named perils. Exclusions are also being imposed on some casualty risks. Exclusion clauses have been prepared for the marine market although the use of exclusions seems to be less common at present than in the non-marine market.
- 5.8 Whilst the use of a year 2000 exclusion clause may seem one of the most attractive methods of reducing an insurer's year 2000 exposure, there are a number of potential disadvantages of the use of exclusion clauses:
 - there is currently excess capacity in insurance and reinsurance markets and it may therefore be difficult for insurers or reinsurance to impose exclusions without losing the business

- it is possible that an exclusion clause may be challenged by the insured when a claim arises. Particularly in the United States, there is a danger of courts overruling the exclusion clause in a coverage dispute
- the use of an exclusion clause may be taken by the courts to imply that year 2000 coverage is available on any policy without the exclusion
- in practice, in some cases, it may be difficult to determine whether a loss was due to the millennium bug
- the use of exclusions is likely to damage the relationship between the insurer and policyholders and to damage the image of the insurance industry as a whole
- the threat of a year 2000 exclusion clause may cause insureds to issue a "laundry list" of notifications on the current policy.

Encouraging insureds to address their year 2000 problem

- 5.9 Clearly the best solution to the year 2000 issue is for the insured to address the problem thereby preventing the loss occurring. Some insurers have sent briefings to their clients containing information on the millennium bug and urging policyholders to address the problem.
- 5.10 Such briefings may well reduce the year 2000 losses which occur. However, by warning policyholders of the danger of year 2000 losses, insurers may also improve their chances of successfully disputing coverage when claims are presented. If an insured has ignored advice from the insurer advising of possible losses, it may be more difficult for the insured to contend that the losses were "fortuitous".

Selective underwriting of year 2000 exposures

5.11 Underwriters will use knowledge of an insured's year 2000 exposures and compliance when deciding whether to write a risk and on what terms. Whilst ideally this information gathering would be performed separately for each risk, in many cases it will be more practical to issue a standard questionnaire to all insureds.

The results of this questionnaire, supplemented by follow up questions as appropriate, can then be used to estimate which risks are more likely to produce claims.

- 5.12 A number of the London Market insurance bodies have developed questionnaires which can be sent to clients to help to judge the prospect of year 2000 exposures. In particular, the Lloyd's Underwriters' Non-Marine Association has produced a questionnaire for US professional indemnity and directors & officers' clients and the Lloyd's Aviation Underwriters Association has developed a questionnaire for aviation clients. Such questionnaires may be used alongside exclusion clauses where the year 2000 exposure is judged to be significant.
- 5.13 The insurance industry is also undertaking research to determine which sectors of industry and commerce are likely to be most affected by the millennium bug. For example, London insurers have developed a prototype index which is intended to indicate the relative risks of year 2000 losses in different countries and sectors of industry.
- 5.14 Insurers may also try to mitigate their exposures to year 2000 claims by insisting that the insured has a greater financial interest in claims experience. This may take the form of significantly increased retentions or coinsurance.

Reinsurance purchasing

5.15 Insurers will need to manage the purchase of reinsurance carefully, particularly if the reinsurance is on a losses occurring (rather than risks attaching) basis. During 1999 the insurer may be writing many policies with possible millennium bug exposures. If the reinsurer declines to renew on 1 January 2000 or insists on a stronger exclusion than the insurer has imposed on its insureds, the insurer may be left exposed to year 2000 claims without reinsurance. The position is even more acute if the reinsurance is renewed after 1 January 2000. The reinsurer will then have the ability to see the extent of the difficulties caused by the millennium bug before deciding whether to renew. Insurers may wish to try to obtain agreements in advance from reinsurers to renew on pre-

agreed terms. Risks attaching reinsurance covers remove the possibility of writing business and subsequently discovering that appropriate reinsurance is not available.

- 5.16 Insurers may wish to take into account the possible types of millennium bug claims which may be received before deciding on appropriate reinsurance. For example, more reinsurance may be purchased on lines fett to be heavily exposed to year 2000 claims.
- 5.17 An insurer has a potential extra exposure if the terms of its direct business are different from the terms of its outwards reinsurance. In particular, if the year 2000 exclusion clause on the reinsurance protections is stronger than the exclusion clause on the business written, the insurer may be left without reinsurance cover for some losses.

Other underwriting issues

- 5.18 In some cases, insurers have apparently not even tried to avoid year 2000 claims. For example, a number of US directors & officers insurers have confirmed that their policies would provide coverage for year 2000 related claims. Some directors & officers insurers are offering endorsements to confirm that such cover exists and, for an additional premium, will pre-set the proportion of the policy limits which would respond to third party claims.
- 5.19 Some insurers have attempted to manage policyholder expectations' through press briefs explaining that insurance policies will not respond to millennium bug claims. The first tranche of briefings, of which we are aware (July 1998) has not resulted in any substantial adverse publicity. If policyholders expectations are swayed by such publicity, it is possible that the number of claims received by insurers will be lower than would otherwise be the case. Since policyholders are being forewarned, the adverse publicity from insurers not meeting claims in the aftermath of the millennium event may be reduced.
- 5.20 Insurers are starting to offer specific year 2000 policies although very high rates on line are often charged.

6 RESERVING

- 6.1 This section considers how insurers could try to assess the possible level of year 2000 claims on business which has already been written. Clearly any estimate of the claims already incurred will be surrounded by very considerable uncertainty. Reasons for this uncertainty include;
 - Computer experts disagree on the likely extent of year 2000 losses. Some experts believe that huge economic damage is likely whilst others expect more limited disruption. Any estimate of the claims will make either an explicit or implicit assumption about the extent of year 2000 losses.
 - Whether these losses will be covered by insurance is unclear and in many cases will probably be tested in the courts in due course.
 - The allocation of any claims across insurance policies is also very unclear.
- 6.2 Whilst the extreme uncertainty means that, in many cases, it will be virtually impossible to produce a reliable estimate of year 2000 claims, if insurers have already written policies which may be exposed, consideration will need to be given to establishing some reserves. Many policies which have already been written by insurers are potentially exposed to year 2000 claims. Possible sources of claims on business written before 31 December 1998 include:
 - Liability business written during 1998 on a claims made basis could suffer year 2000 problems. For example, some software houses in the United States have already been sued with plaintiffs alleging that the software house sold non-compliant software and should therefore remedy the fault free of charge. Such a claim will be made on the errors and omissions policy in force when the claim is reported. Classes affected by such claims could include errors and omissions and directors and officers.

- Claims made policies may also be vulnerable even if no action has yet been taken against the insured. If insurers attempt to impose a year 2000 exclusion the insureds may try to submit "laundry lists" of potential claims on the current policies. Insurers may try to strike out such claims.
- A binder or lineslip accepted during 1998 on a risks attaching basis could include policies in force at the turn of the century. For example, a binder written on 1 July 1998 may bind policies incepting up to 30 June 1999, these underlying policies could have exposures which remain in force into the next century.
- Any policy which extends for more than one year. Examples include extended warranty, creditor, construction and mortgage indemnity business.
- Long term agreements to renew policies at pre-agreed premium rates.
- Any occurrence policy where there is a danger of a claim which becomes apparent after 1 January 2000 being allocated back to a policy which has already been written. A possible example would be a products claim relating to equipment which has already been provided but which fails and causes losses in the next century. There may be discussions over the occurrence date for such a claim which may result in the claims being allocated to a policy which incepts before the end of 1998.

Reserving before the millennium

6.3 The size of the potential year 2000 exposures and the information available to the reserving process will change substantially over the next few years. At the 1998 year end the volume of business which is exposed to year 2000 claims is likely to be relatively small compared to the position at the 1999 year end. However, reserves for the 1999 year end are likely to be estimated early in 2000. As a result, much more information on the possible size of year 2000 losses will be available. Issues of coverage and allocation to policy years will probably still be unclear at this stage. At subsequent year ends more information will be available on coverage and allocation. We have set out below some thoughts

on how insurers might consider the level of reserves to establish for year 2000 claims at the 1998 year end.

- 6.4 The type of business written by an insurer will have a strong influence on the potential for year 2000 claims. A writer of professional indemnity insurance is likely to be more exposed than a motor insurer. Furthermore, the nature of the risks written within an individual class will also influence the likelihood of claims. A professional indemnity cover for software consultants may be more exposed than an insurer providing professional indemnity cover to architects. The insured's degree of year 2000 compliance and the use of policy exclusions will also influence the likely extent of claims. Thus to obtain an understanding of the potential size of year 2000 claims on business already written, it is necessary to obtain detailed information on the risks which have been written.
- 6.5 The information to be collected on the risks written will vary greatly between different classes of business. As a general rule the exposures will need to be analysed by the factors which are believed to influence the potential for year 2000 claims. For example, for a professional indemnity account, the information to be collected for each risk could include:
 - name of insured.
 - sum insured for each layer written
 - reinstatements
 - date of policy inception and term
 - nature of the insured's business
 - territorial split of insured's business
 - has date dependent software ever been sold (if yes, further details would be required)
 - other types of advice which may cause exposure to year 2000 claim (eg mergers and acquisitions, audit work etc.)
 - degree of year 2000 compliance both currently and for software sold in the past

- reported year 2000 claims (even if only precautionary advices)
- use of year 2000 policy exclusions.
- 6.6 Further detailed analysis may be required for an insured which clearly has a significant exposure such as a company selling software. In such cases information could be gathered on each software product sold including the number of systems sold in each year, typical potential losses which could emerge from each sale, the progression of year 2000 compliance for each product and the action which has been taken by the insured to address non-compliant versions of the software which have been sold. Collecting the data described above may seem a very onerous task. However, much of this data may be required for underwriting ongoing risks. Furthermore, the Insurance Directorate made clear in their letter to managing directors dated 1 May 1998 that companies are expected to undertake detailed analyses of their vear 2000 exposures (both from the perspective of reserve adequacy and to ensure appropriate underwriting action is taken for new business and renewals).
- 6.7 The process of collecting information to obtain a detailed understanding of the exposures will also be of value if claims start to emerge. The source of claims can then be compared against the known exposures which will help to judge the potential for further claims to emerge.
- 6.8 Having obtained a detailed understanding of the potential for claims on business already written, the level of reserves will then need to be considered. One possible approach would be to apply factors to the exposures in subsets of the account believed to be exposed, with higher factors being used in areas where the likelihood of claims is believed to be greater. The factors would need to reflect a number of considerations including:
 - the perceived losses which may occur on a given piece of first loss exposure if year 2000 claims arise. The possible losses may be greater than the exposure if there is a possibility of more than one claim arising (for example, a single insured could suffer many professional indemnity claims arising for a single software product)

- the probability of these losses arising
- the probability of any losses being recoverable from the insurance coverage provided. Consideration will therefore need to be given to the likely effectiveness of the insurer's defences to coverage
- if a net of reinsurance estimate is required, the possible availability of reinsurance recoveries.
- 6.9 It is inevitable that the choice of factors will be a very difficult process. Any set of factors will include an implicit judgement about the extent of year 2000 losses that are likely. As noted above, even computer experts have widely different views about the possible extent of year 2000 losses.

"Top down" approach

- 6.10 It is also possible to use a "top down" approach to obtain a tentative estimate of the possible year 2000 losses affecting an account. For example, in order to estimate the possible losses on a UK commercial property account, the following procedure could be followed:
 - choose an estimate of the total year 2000 losses for the UK economy. Clearly this estimate will be highly subjective as many computer experts have very different opinions on the size of the potential losses
 - estimate the proportion of the assumed losses which affect commercial property risks
 - estimate the proportion of these commercial property losses which will be insured. This factor will need to allow for the proportion of the losses which relate to risks which are not insured and the perceived strength of insurers defences to year 2000 claims on risks which have been insured
 - estimate the proportion of commercial property market which the insurer covers. A guide to this factor can be obtained from the proportion of commercial property premiums written by the insurer. Adjustments would need to be made if the account's

exposure to year 2000 claims was perceived as higher or lower than average

- estimate the proportion of year 2000 claims which will fall on policies already written. This stage will require assumptions to be made on the allocation of claims to policy years.
- 6.11 The main difficulty with such an approach is that many of the factors which need to be estimated are highly uncertain. However, such an approach may help the insurer to gain an understanding of the relationship between the proposed level of reserves, perhaps estimated from a detailed review of exposures, and the level of year 2000 losses in the economy as a whole.
- 5.12 The first stage of the procedure suggested above is to obtain an estimate of the year 2000 losses for the UK economy as a whole. It is important to emphasise that it is an estimate of the losses which occur as a result of non-compliance which is required. The estimates given in paragraphs 3.10 and 3.11 are for the cost of year 2000 compliance, not for the cost of losses emerging from non-compliance. Estimates of the losses which may occur are rarely available from public sources which is not surprising as the size of the losses is much more difficult to predict than the compliance costs. If it is believed that compliance costs is "money well spent", the estimate of the losses emerging from noncompliance would presumably be at least as great as the cost of the compliance which is not undertaken. The only estimate which we could find in this area is from a paper by Software Productivity Research published in 1997. This paper suggests that "for every dollar not spent on repairing the year 2000 problem the anticipated cost of litigation and potential damages will probably amount to more than ten dollars". This comment was written in a US context where the likelihood of litigation is higher than in the UK. The comment also appears to be a "quesstimate" at best as no justification is given in the paper.

Other issues

6.13 There may be a reluctance by insurers to establish reserves for US year 2000 claims where coverage is in dispute as the existence of such reserves may damage insurer's defences if the court became aware of the reserves.

Appendices

Potential implications for each major line of business

A	Liability classes
в	Marine and aviation
с	Commercial property & business interruption
D	Household
E	Motor
F	Personal accident and travel cover
G	Credit, creditor and mortgage indemnity insurance
н	Extended warranty
I	Reinsurance

APPENDIX A

Liability classes

1 Directors' and Officers' Insurance ("D&O")

This insurance usually covers the insureds for wrongful acts. Although in Britain D&O claims are not, at present, common it is possible that the millennium bug could generate a flood of such claims. The most likely source of such claims is likely to be directors and officers who fail to adequately prepare their businesses for the millennium bug. Legal activity may be brought against the directors and officers for failing to carry out their duties properly and diligently.

2 Professional indemnity - E&O insurance

There is considerable potential for millennium bug related E&O claims. Perhaps the most obvious source of such claims is professionals who advise on computer issues including particularly those who advise on millennium bug compliance. However, there are many other potential sources of millennium bug related E&O claims including:

- auditors who are required to disclose their clients' degree of millennium bug compliance in the accounts
- any professionals who have sold software
- any professionals advising on mergers and acquisitions. Possible sources of claims include professionals failing to warm clients of Year 2000 compliance issues within a target company, or errors in the professional's calculations relating to a merger or acquisition caused by errors in the professional's systems
- more generally, any professionals who rely on computer based calculations are potentially at risk.

Professional indemnity insurance is normally written on a "claims made" basis. Claims made policies usually exclude the consequences of any circumstances known to the insured at the inception of the insurance that might reasonably have expected to produce a claim. As year 2000 issues have been well publicised for some time, insurers may contend that claims are excluded by virtue of this provision, but it is likely that the insured may make a counter argument that 'circumstances' are inconclusive until a full assessment of systems has been carried out to reveal whether or not they are year 2000 compliant.

Many professionals are currently reviewing their terms and conditions of engagement in respect to the year 2000 issues in an attempt to mitigate their responsibilities and/or limit any claims that may be made. However, the effectiveness of these clauses has yet to be tested through the courts.

3 Public and Products Liability

There is a danger of public and product liability claims arising from the failure of equipment which is dependent on computer programs or embedded chips. Example of products which could fail include machinery, lifts and sprinkter systems. Providers of computer software or hardware may find themselves exposed to liability claims if their products fail and cause damage to their clients' businesses. For example, software failures could cause a client database to be corrupted.

4 Employers liability

Failure of equipment in the workplace due to the millennium bug could cause employers liability claims. Possible examples include injuries arising from failures in machinery, lifts or safety equipment. However, year 2000 related claims are likely to be shorter tail injury claims rather than the longer tailed industrial disease claims.

Businesses are required by law in Britain to purchase employers liability insurance. An exclusion for year 2000 problems cannot be introduced for legal reasons.

Many commentators regard D&O and E&O insurance as classes which are particularly exposed to year 2000 related claims. Such claims could emerge before 1 January 2000 if, for example, a software supplier is sued by clients demanding that any non-compliance in software they have purchased is rectified. In practice, claims are much more likely after 1 January 2000 when damage has been caused. Delays in issuing legal proceedings may cause liability claims to emerge rather more slowly than claims on physical damage classes.

APPENDIX B

Marine and aviation

There are significant potential year 2000 exposures for marine and aviation insurers. Aviation losses could be caused by problems with the plane's electronic equipment including navigational aids. Claims could also occur as a result of problems with the electronic equipment used by air traffic control. Security systems at airports could be another area of weakness.

Navigational aids fitted to ships could also malfunction possibly leading to hull or cargo claims. Failure of refrigeration equipment could lead to loss of cargo. Energy losses could arise from failures in a wide range of electronic equipment including safety equipment. Marine liability losses could arise from many sources, including injury to crew due to a failure of safety equipment or collisions with other vessels, or harbours due to the failure of navigational equipment.

The Joint Cargo Committee has produced a year 2000 exclusion clause for use by underwriters. It appears that the rig liability and hull markets are likely to use similar exclusion clauses.

Any impact of year 2000 on marine and aviation losses is likely to occur fairly quickly following 1 January 2000, although losses could continue to occur for many years. Problems with the electronic systems on aircraft or with air traffic control's systems are likely to emerge quickly, although a problem could remain hidden for some time before an incident occurs. Marine losses could also occur over a significant period. Particularly the failure of safety equipment may not be noticed until an incident occurs.

APPENDIX C

Commercial property & business interruption

The scope for property and business interruption losses arising from the millennium bug is considerable. Some of the possible sources of loss are set out below:

1 Commercial property

- failure of safety equipment leading to property damage. For example failure of fire detectors could allow a major fire to develop
- failure of manufacturing equipment leading to damage to the equipment, the stock or the building.
- failure of security systems leading to theft or vandalism
- failure of refrigeration, air conditioning or heating equipment which may lead to damage to raw materials or stock
- damage to computer hardware or software or data
- failure of infrastructure including water and power supplies which could lead to property damage losses. For example, a loss of the water supply may restrict the ability of fire-fighters, leading to increased losses.

2 Business interruption

- loss of profits due to any of the examples of property damage given above
- interruption due to suppliers, distributors or customers with year 2000 problems. The usual form of the suppliers' extension clause only provides cover if the interruption in supply is due to a peril which is covered under the main business interruption policy. Thus, if the insured is only covered for business interruption arising from the effect of property damage on his own premises, the insured would normally only be covered if the interruption in supply was due

to property damage at the suppliers' premises. This feature may substantially reduce the extent of business interruption year 2000 claims.

There are many legal issues surrounding the possibility of property and business interruption year 2000 claims including:

- is the loss "accidental"? It is possible to envisage many different circumstances which may lead to different interpretation of "accidental". For example, if a company fails to ensure year 2000 compliance and subsequently loses their computer data; is such a loss accidental? What if the computer failure leads to failure of fire safety equipment which allows a fire to start?
- will computer hardware and software be considered "property"? Often the policy does not identify the particular types of property covered. It is possible that there may be different interpretations for more tangible hardware (eg PCs) and less tangible software
- the effectiveness of any year 2000 exclusions which are included in policies.

Many business interruption losses and property losses involving computer hardware or software are likely occur on or soon after 1 January 2000. However, a substantial tail is also likely as failures of safety equipment may not be apparent until an incident occurs.

APPENDIX D

Household

There appear to be two main possible sources of household insurance claims arising from the millennium bug. If utilities such as electricity suppliers and water companies suffer disruptions to their service due to year 2000 problems, household insurers could suffer losses. Possible sources of claims include:

- winter freeze claims due to power cuts
- flooding as a result of sewage back-up
- loss of freezer contents due to power cuts.

It is also possible that household goods such as videos, telephones and washing machines may not operate correctly due to problems with embedded chips. Whilst many household insurers have imposed exclusions to remove their direct exposures to the failure of household equipment, indirect exposures remain. For example, electric equipment such as a cooker may fall and cause a fire or a washing machine maifunction could cause a flood.

It is difficult to estimate the impact of year 2000 on household insurers. Household insurers year 2000 claims are likely to be crucially dependent on the ability of major utilities to maintain supply and the extent of the embedded chip problem on household goods. If claims do occur, it is likely that they will be reported to insurers relatively quickly during 2000.

APPENDIX E

Motor

A number of possible effects of the millennium bug on motor insurers can be envisaged including:

- microprocessor induced failure of safety critical features such as ABS brakes causing increased accident frequency and perhaps increasing the severity of accidents
- possible changes in the frequency of accidents caused by breakdown of traffic management systems such as traffic lights
- possible reduction in accident frequencies if cars simply do not start on 1 January 2000
- possible increase in the severity of claims if medical infrastructure is impaired (ambulances may arrive late, hightech. hospital equipment may not work); this may be mitigated to some extent by fewer severely injured victims of road traffic accidents surviving.

We understand that some manufacturers are paying for their tied garages to replace cars microprocessors with year 2000 compliant microprocessors.

It is likely that the extent of year 2000 losses on the motor account will be heavily dependent on possible embedded chip failures within cars. Motor is widely regarded as one of the classes with the smallest exposures to year 2000 claims. Millennium related motor claims are likely to manifest themselves in the first half of calendar year 2000.

APPENDIX F

Personal accident and travel cover.

Personal accident policies pay fixed scale amounts in the event of accidents. It is likely that the overall level of additional accidents caused by the millennium bug will be small. Personal accident policies are unlikely to suffer any significant increase in claims.

Travel policies provide cover for disruptions to holidays in addition to accident and medical expenses cover. Some failure of the travel infrastructure can reasonably be expected on and after 1 January 2000. This is likely to lead to greater delays and claims in respect of delays being experienced. Rating or coverage adjustments could presumably be made quickly, if necessary, to trip insurance, but exposure would remain on annual policies.

It is conceivable there could be additional accident and indeed death claims arising from aviation or other travel accidents.

We expect claims in this class to manifest themselves very quickly following 1 January 2000. We expect the claims to be short tail and to be settled in the first few months of 2000 (barring coverage disputes).

We expect the overall impact to be relatively slight, although it is possible to envisage significant travel insurance claims if there is major disruption to transport systems.

APPENDIX G

Credit, creditor and mortgage indemnity insurance

1 Credit

Credit insurance covers the failure of customers to pay for goods bought on credit. Much credit insurance is linked to export sales.

Clearly if the millennium bug gives rise directly or indirectly to a spate of bankruptcies, credit insurers will face increased claim levels from insureds with business sector customers. This risk of additional claims where bankruptcies stem directly from millennium bug problems may be most pronounced in respect of debtors in countries that appear to have made least effort to defuse the bugs. Reports indicate that developing countries generally, and Africa in particular, fall into this category although the limited dependence of such countries on computers may reduce these exposures.

2 Creditor

Creditor insurance, which is generally sold together with personal loans, covers loan repayments on specified loans, during specified periods so long as the policyholder is in certain categories, typically sick, disabled, dead or unemployed.

We do not anticipate the millennium bug triggering direct claims (apart perhaps from a few claims stemming from millennium bug related injuries). However, should there be substantial economic dislocation and a general rise in unemployment levels, claims on creditor insurance are likely to rise markedly.

3 Mortgage Indemnity

Mortgage indemnity insurance, which is normally purchased when a mortgage is advanced, covers the lender if the borrower defaults and it is necessary to repossess the property. The insurance covers any deficit suffered by the lender after selling the property.

Claims on mortgage indemnity insurance are heavily linked to the level of interest rate and house prices. If millennium problems significantly reduce economic growth, mortgage indemnity claims may rise. If firms fail and make workers redundant there will also be an increase in claims

The advice of these claims should lag the manifestation of the physical millennium bug problems. However, as credit, creditor and mortgage indemnity is often written on policies with a term longer than a year, some existing policies may well be exposed to millennium bug claims. Indirect claims resulting from adverse economic conditions could stretch out over several years. The overall impact could be very severe if there is significant economic dislocation.

APPENDIX H

Extended warranty

Brown and white goods are often sold with the option of purchasing extended warranty insurance. This insurance effectively extends the period for which the performance of the product is guaranteed. The insurer covers the costs of repairs after the expiry of the supplier's/manufacturer's (statutory or contractual) guarantee period. The periods guaranteed are typically between two and five years. The policyholder is the person who has purchased the goods insured. We understand that year 2000 exclusion clauses are currently being placed in at least some extended warranty products.

If the product fails to perform during the period of the insurance the policyholder has a claim on the policy. The failure rate of brown and white goods after the year 2000 with embedded microchips may be substantial. The replacement costs and repair cost of brown and white goods in the event of significant year 2000 problems could rise substantially, as scarce resources are bid up.

Factors which may reduce year 2000 extended warranty insurance claims include:

- manufacturers' guarantees for products within the manufacturers' guarantee, and product recall and product guarantee insurance
- exclusion clauses.

Extended Warranty contracts are usually personal policies and therefore covered, in the UK, by unfair contract terms legislation. As discussed in section 4, there is doubt as to whether exclusion clauses would fall foul of the Unfair Terms in Consumer Contracts Regulations. Extended warranty writers face a possible mismatch between the exclusions their reinsurers place on them, and the exclusion they can impose on the consumer.

Even if such exclusions pass the unfair contract terms test, there is a danger that allegations of misselling could be made against insurers for

excluding cover for a peril consumers expect (and intend) to be covered against.

Ideally, one might consider only offering coverage at standard rates on products that are on an approved list as having been confirmed to be year 2000 compliant. In practice there will be broader criteria, such as the manufacturer being on an approved list as a manufacturer who is confirmed as substantially year 2000 compliant. Cover for other goods would then either not be offered, or offered only at non-standard rates, thought to allow for the potential for excessive claims. Whether the brown and white goods retailers that broke extended warranty cover to their customers would be willing or able to cope with differential rating is open to question.

A significant proportion of the extended warranty policies which are exposed to millennium bug claims have already been written. Insurers may need to revisit their reserving policies to ensure that the earning patterns appropriately reflect the changed risk profile and that appropriate unexpired risk reserves have been established.

We expect a relatively short tail of reported claims. The process of deciding whether any exclusion clauses are valid could however spin out the payment of claims over several years.

Some US and Canadian auto warranty business is written in London. The above issues should also be considered in respect of this business.

The impact is potentially severe although it will be highly dependent on the extent of the problems which embedded chip failure causes in household goods.

APPENDIX I

Reinsurance

Reinsurers faced with millennium bug problems appear to have two options. First, they can put absolute exclusions in policies for all date related losses. Alternatively, reinsurers could attempt to underwrite the exposure, trying to limit their losses arising from year 2000 claims. In practice this may involve discussions with their cedants in order to ensure that the reinsurer is comfortable with the approach followed by the cedant to minimise year 2000 claims.

There will be a genuine need for insurance companies faced with the prospect of claims caused indirectly by the millennium bugs to purchase reinsurance. There will thus be pressure from brokers and cedants to grant at least some coverage for millennium bug related losses via write-backs or otherwise.

For companies writing or writing back millennium bug coverage, it will be important that reinsurers check that the coverage their cedants offer is well managed and understood by both the cedant and the reinsurer.

Despite the blanket coverage of the year 2000 problem in the trade press, it is to be expected that current soft market conditions may induce some underwriters to take on more exposure than they realise and risks that they fail to appreciate.

Aggregation clauses are another problem issue for reinsurers writing millennium bug coverage. Past history has shown the scope for litigation in relation to reinsurance policy wordings, and aggregation clauses in particular. Clearly, effort spent trying to ensure it is entirely clear what aggregation is permitted will be effort well spent, however lawyers have shown themselves consistently to be more creative in finding ambiguities and new meanings for clauses than their draftees ever imagined. Given the potential size of year 2000 claims, aggregation clauses will be under close scrutiny for any wormholes to increased coverage.

There are many possible ways in which millennium bug claims could be aggregated including:

- all losses caused by any date related computer problem.
- all losses stemming directly or indirectly from one computer problem
- all losses stemming from one software house, or one microprocessor manufacturer
- all losses occurring in a 36 hour period.

Whether aggregation is possible and the method of aggregation is likely to differ between classes of business and types of reinsurance. One of the most important issues is for reinsurers writing covers with an hours clause to ensure that the cedant is not able to aggregate all losses occurring in the first 36 hours of 2000 as one "event".

Clear overall aggregate limits for date related claims may help to restrict the damage that legal attack on aggregation clauses could cause.

Further problems could arise as to which policy year responds to year 2000 claims. This problem will be particularly acute when there is a change in reinsurers on a program, or when some years have millennium bug exclusion clauses and some do not.

In addition there are accounting issues raised by the spiky exposure in early January 2000.

There will be a large volume of insurance contracts that are written during 1999, that will rely on reinsurance commencing on 1 January 2000 for their protection. As such, there is a danger of this run off reinsurance cost not being correctly reflected against the premiums on which the inward exposure occurs. This is especially so for the Lloyd's market where a one year venture operates and differentiates the years' risk bearers to a considerable extent. Reinsurers will need to consider the potential difference between their inwards and outwards coverages. For example, if inwards claims are permitted to be aggregated but outwards recoveries are on an each and every claim basis, the reinsured could end up holding a disproportionate share of the net claims. Differences between "losses occurring during" and "risks attaching" may also distort the net result.

If millennium related claims are significant, some reinsurance failures may result. The actuary reserving for such claims must clearly consider the potential for both reinsurance failure and reinsurance dispute.

There are also issues for reinsurance purchasers. These are described in section 6.