

# **Reinsurance: The Nuts and Bolts**



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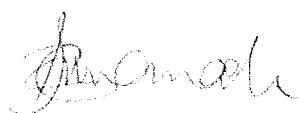
## Introduction

Keith Riley joined Willis Re in August 2012 and brings 40 years' reinsurance experience to our team.

I have been working in the reinsurance market for almost as long as Keith and whilst my knowledge of the market may well fill a book, the skill of writing it is beyond my expertise. The detail Keith provides – the nuts and bolts of how reinsurance works – can only come from years of experience, and the way in which he presents these nuts and bolts provides the opportunity for even the longest standing members of this market to learn something new.

Keith wrote the first edition of *The Nuts and Bolts of Reinsurance* in 1996, following the success of his delivery of a number of technical reinsurance workshops to the Brazilian insurance market. Our market continues to develop, both in terms of the financial and regulatory environment we exist in, and the developing risks of a constantly evolving world we are required to reinsure. The result of this ongoing change and development means that *Reinsurance: The Nuts and Bolts* is on its third revised edition and is an up to the minute, bound and published representation of Willis Re Reinsurance market expertise.

It therefore gives me great pleasure to present this special Willis Re edition of *Reinsurance: The Nuts and Bolts* to our friends and colleagues in the reinsurance industry.



John Cavanagh

CEO, Willis Re

## **Willis Re**

Willis Re is one of the world's leading reinsurance advisors. Over our 180-year history, we have developed a deep insight into all aspects of the global insurance industry. Willis Re serves the risk management and risk transfer needs of a diverse, global client base that includes all of the world's top insurance and reinsurance carriers as well as national catastrophe schemes in many countries around the world. The broker's global team of experts offers services and advice that help clients make better reinsurance decisions, access worldwide capital markets and negotiate optimum terms.

Written by a Willis Re expert and now in its third edition, *Reinsurance: The Nuts and Bolts* provides a detailed insight into the workings of both the Reinsurance industry and the London Market. This special edition is printed and distributed by Willis Re and The Willis Re Academy.

## **Willis Re Academy**

The Willis Re Academy's Reinsurance Training Programme, a comprehensive introduction to the world of Reinsurance, has been educating Willis clients in reinsurance principles, practices and products for over 30 years. Willis and Willis Re experts deliver this market-wide client training programme around the world, providing Willis Re Associates and Clients with the opportunity to grow and enhance business relationships and demonstrate the Willis values of teamwork and collaboration, as well as our industry leading Reinsurance expertise.

## About the Author

Keith Riley began his career in reinsurance in 1973. After four years, he was seconded to Tehran for six months, where he gained invaluable experience in all classes of direct insurance before returning to London, where he began working in the Treaty Department, specialising in clients from the Middle East. Since that time, he has been involved with all aspects of reinsurance broking in most parts of the world.

A fluent Spanish speaker, he now works for the APMETA (Asia Pacific, Middle East, Turkey and Africa) Division of Willis Re, as part of the Japanese Treaty team.

He has delivered reinsurance workshops in Brazil, Japan and the United Kingdom.

During 2009, *Reinsurance: The Nuts and Bolts*, 2nd Edition was translated into Portuguese and published in Brazil under the title 'O Quebra-Cabeça de Resseguro'.

The 3rd edition of the English title was published in 2012 and continues to be a valuable reference work with a truly international readership.

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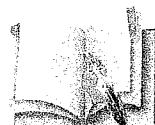
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# Chapter 1

## What is Reinsurance and Why do we Need It?



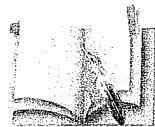
To answer this most basic of questions, we need to go back to the origins of insurance itself. By this, I do not mean all that stuff about Mr Lloyd's coffee shop or the merchants of Lombardy; enough has been written elsewhere on this. We need to understand the basic concepts, leaving out the historical detail. To do this, I shall rely on a short parable.

Fred Bloggs lived in a village, in a modest cottage. There were about a hundred similar cottages in Fred's village. One day, Fred's cottage burned to the ground, and Fred was left homeless and destitute. Fortunately, Fred had very good neighbours who clubbed together to rebuild his cottage. They also collected some old furniture.

Because one man's loss was shared among a hundred people, each of them was able to manage their share of the burden. This is insurance in its most basic form.

However, as life became more complex and good neighbours harder to find, the village cooperative approach to insuring risk became unreliable.





**Professional insurers developed a system of charging premiums to accumulate funds that pay for eventual losses. As insurers grew, they accepted increasing numbers of risks, so that losses were bound to occur from time to time. Insurers were able to use statistical information about these losses, gathered from their experience of insuring many thousands of risks. This enabled them to refine their rating structures, which determine the premium to be paid, to reflect more accurately the degree of hazard.**

Fred thought it would be a good idea to formalise the insuring of the houses in the village. Farmer Giles had not been as generous as the other neighbours and so Fred began to wonder whether good neighbourliness would always come to the rescue in a crisis.

Fred formed a 'club' into which every householder in the village paid weekly contributions. The money was put into the bank, where it earned interest, and gradually a fund was built up that would be enough to pay for a new cottage and some furniture should another fire occur. Even Farmer Giles became a member because he feared that, if he ever suffered a fire, his neighbours might recall how mean he had been to Fred and refuse to help him.

When the people in the next village came to hear about Fred's scheme they were eager to join and soon Fred had a booming business. From time to time there were minor losses, but there was always enough money in the bank to meet the cost of repairs.

The story might have ended there but for two things:

1. There was a severe windstorm, which resulted in so many lost roofs that Fred's company almost went out of business.
2. The company was asked to insure the Manor House for a value many times greater than any of the cottages that were on the company's books at that time.

This is what reinsurance is all about. An insurer may well be capable of meeting all of its obligations that arise out of everyday situations, but there are times when the insurer may be required to take on risks that are larger than usual and there is a risk of an occasional event that gives rise to an unusual number of losses.

## Large Risks

If a company insures several thousand buildings with values of around £100,000 and only one or two with values of £5,000,000, the company's book of business (its 'portfolio') is thrown out of balance by the larger risks.

The premium that the company receives for each of the smaller risks may be as little as £100. If one of the £5,000,000 risks is totally destroyed, the company will lose the equivalent of the premiums from 50,000 smaller risks to pay for this single loss.

The company would be wise to purchase reinsurance on these larger risks to protect itself against this kind of imbalance.

## Catastrophic Losses

In reinsurance terms, a catastrophe is a single event that results in losses affecting more than one insured risk. Technically, a fire in one building that spreads to another building (where both are insured by the same company) is a catastrophe (in this case, a 'conflagration'). More common examples of catastrophes are hurricanes, earthquakes, floods, winter freezing leading to burst pipes and water damage, etc. In these kinds of event, each individual loss may be small (roof damage during a storm, for example) but the accumulated losses to the company may be many times the annual premiums collected.

These are the two most common situations that will prompt a company to purchase reinsurance. The company looks at the factors that expose it to higher degrees of hazard than it is capable of bearing. It then 'lays off' this extra risk to other companies or underwriters, known as 'reinsurers'.

The company's purpose in buying reinsurance is to stabilise its results over the long term to maintain profitability, by 'ironing out' fluctuations in the underwriting result that may be caused by infrequent large losses. This does not mean that reinsurance guarantees that the company will make a profit. Generally, however, if the company's business is profitable for 99 years out of 100, it will want to put aside a little of the profit to provide a buffer against the consequences of the odd bad year.

The purpose of buying reinsurance may be summarised as stabilising results in order to protect the insurer's balance sheet. Reinsurance (or 'risk transfer') is not the only way of doing this; companies use financial instruments such as derivatives, currency dealings, interest rate swaps, etc, but reinsurance remains the most widely used method of protection against large swings in an insurer's underwriting results.

However, we must not overlook one very important reason for an insurer to purchase reinsurance, which is to provide an economical method of leveraging the company's capital. Many insurers view their reinsurance arrangements purely in terms of the net cost or benefit (premium against claims and commission) without considering the value of the virtual capital that reinsurance provides.



**So far, for reasons of simplicity, I have used property insurance in all of my examples. However, insurance is a diverse field and it is amazing how many different types of risk are insurable. We shall deal with many of these later on in this book.**

## Chapter 2

# Types of Reinsurance

Before dealing with the different types of reinsurance we need to look at an older way of spreading a large risk, known as 'coinsurance'. This is where several insurance companies take shares of a risk and the name of each insurer, as well as its share of the risk, will appear on the insurance policy.

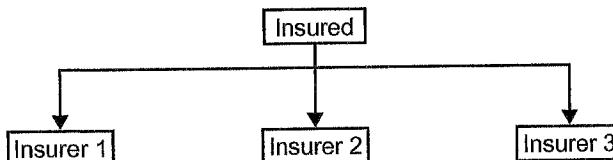
Coinurance is generally arranged by insurance brokers, who fill a 'slip' containing details of the risk. The slip is taken to a number of underwriters who mark their acceptances on it. Each of the underwriters will enter into a contractual relationship with the insured party. A company that accepts a 10% coinsurance share of a risk will only ever be liable for 10% of any losses, even if some of the other coinsurers fail to pay their share.



**Some insurance companies arrange coinsurance themselves, either on individual risks or using prearranged business pooling arrangements with other companies.**

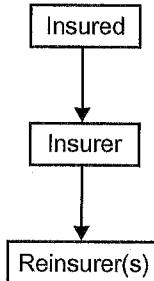
Reinsurance differs from coinsurance in a number of ways, but perhaps the most important is that there is no contractual relationship between the direct insured and the reinsurer. There are separate contracts involved, one between the insured and the insurer and another between the insurer (or reinsured) and the reinsurer.

### Coinurance



**Contractual relationships are between the insured and each insurer separately. If one insurer fails to pay its share of a claim, the others are not liable for more than their own shares.**

## Reinsurance



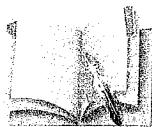
 **The insured only has a contractual relationship with the insurer. The insured is not a party to the contract between the insurer and the reinsurers. The insurer must pay valid claims, even if he fails to recover from his reinsurers.**

There are many types of reinsurance, which can be broken down into two main groups, facultative and treaty, each of which has further subdivisions.

### 2.1 Facultative

Facultative means 'optional', and is usually used to describe the reinsurance of a single risk. It is optional upon both the insurer and the reinsurers. The insurer is free to decide whether or not to buy reinsurance, how much and from whom. The reinsurers are free to accept the risk or not.

In its simplest form, facultative reinsurance is very similar to coinsurance except for the differences in contractual relationships and the payment of commission by the reinsurers to the insurer.

 **In a reinsurance relationship, the insurer is known as the reinsured or ceding company.**

The 'ceding commission' is designed to reimburse the ceding company for the reinsurer's share of his acquisition costs (brokerage or agency commission paid by the ceding company to attract the business), and makes a contribution towards the ceding company's other costs, such as administration, advertising, etc.

If the insurer has paid away 20% of the original gross premium as acquisition costs, and receives a total of 25% ceding commission on the facultative reinsurance placement, the additional 5% is referred to as 'overriding commission'. This is the contribution towards the ceding company's other costs referred to above.



**In theory, an insurer should not make a profit from reinsurance commission but, in reality, commission rates are used by reinsurers in a competitive way and can often be a good way for direct insurers to improve net underwriting profit.**

Facultative reinsurance can be split into two main categories.

### 2.1.1 Pro-rata (or proportional)

If the insurer covers a risk valued at £10,000,000 but can only afford to lose £1,000,000 in a single loss, it could buy reinsurance for 90% of the risk.

The reinsurers would receive 90% of the original gross premium (less their share of any premium tax as well as ceding commission at an agreed rate) and would reimburse the company for 90% of all claims payments that the ceding company makes to the insured.

Just as in insurance, reinsurance is usually placed by way of a 'slip' that is shown to prospective reinsurers, who will indicate whether they want to support the risk by 'writing a line' on the slip. This is either carried around the market by a broker, sent to reinsurers' offices by facsimile or letter, or sent electronically to the market.

In the London market, the slip is now referred to as the MRC (market reform contract) and is designed to be fully 'contract-certain' at inception. This means that every clause applicable to the reinsurance contract must be incorporated within the MRC, either in full or referenced by a recognised standard clause number.



**Terminology such as 'as original' is now deemed not to be contract-certain. Ideally, a copy of the original policy should either be attached to the MRC or the original policy conditions should be stated and the original policy number recorded.**

The following is a typical slip for a pro-rata facultative reinsurance. It is not in MRC format as this would overcomplicate the text, but is designed to illustrate the concept of facultative reinsurance, rather than to provide a template on which to base a facultative placement.

Broker's reference: F13245

Type: Fire, lightning and explosion reinsurance

Form: Slip policy

Insured: ABC Textiles Limited

Reinsured: XYZ Insurance Company Limited

Period: 12 months at 1<sup>st</sup> January 2012

Interest: Building, machinery and contents of the insured's textile mill

Sum Reinsured: 90% of £10,000,000 divided as follows:

Buildings:	£3,000,000
Machinery	£4,000,000
Stocks	£3,000,000

Situation: Warrington Road, Derby, England

Conditions: Full Reinsurance Clause:  
Being a reinsurance of, and warranted same gross rate, terms and conditions as and to follow the settlements of the reinsured, and that said reinsured retains during the currency hereof not less than 10% on identical subject matter and risk and in identically the same proportion of each separate part thereof, and in the event that the retained amount is less than stated above, reinsurers' lines hereon to be proportionately reduced.

Original Policy Number: XXXXXX

Premium: Original gross rate: 2.25‰ (per mille)

Commission: 25% plus taxes as original

Brokerage:	5% of gross premium hereon
Information:	Factory in operation since 1987 No known or reported losses as at DD/MM/YYYY

The MRC would be a far larger document aimed at ensuring contract certainty at the outset. Templates for MRC documents are discussed in Section 10.6. Reinsurers now require far more information to enable them to evaluate a risk, and would want to see the latest survey report so that they could get to know about the type of construction of the buildings, fire protection, housekeeping standards, machinery details, etc.



**The Full Reinsurance Clause looks a little Shakespearean these days, but is still in use in the London market.**

The purpose of the full reinsurance clause is to tie the reinsurance contract to the fortunes of the ceding company (reinsured). In other words, the reinsurer is accepting responsibility for 90% of the reinsured's losses that affect the original policy, in return for which he will receive 90% of the original gross premium.

The 90% share of the reinsurer covers all interests under the original policy, which means that the reinsured cannot choose to keep 100% of the buildings item and nothing on the contents. This is what is meant by the words "*and in identically the same proportion of each separate part thereof*".

The clause goes on to state the reinsured's retention, which is used by reinsurers to gain an idea of what the reinsured actually thinks of the risk. It is, therefore, made a condition of reinsurance that if, for example, the reinsured states that he is retaining 10% of the risk, and after a loss it transpires that he had placed another 5% share elsewhere, resulting in a retention of only 5%, the reinsurers would be entitled to pay only 50% of their share of the loss.

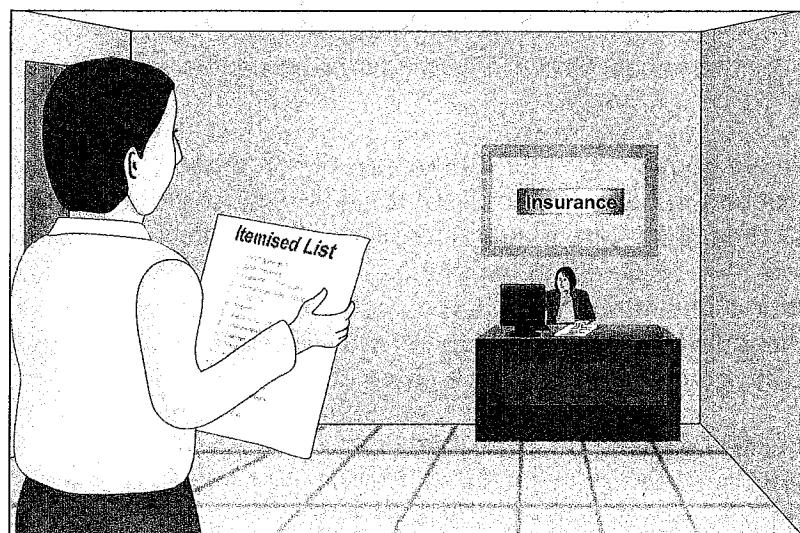
Without such a provision, it could be argued that the reinsurers could avoid any reinsurance on the grounds of misrepresentation. However, many brokers amend some of the provisions of this clause in a variety

of ways, in order to allow the reinsured more freedom of action. For example, it is common to delete reference to retention or original gross rate.



**As a purely personal opinion, I find this a worrying development as it attempts to allow ceding companies to treat their reinsurers unfairly.**

One thing the full reinsurance clause does not specify is what, if anything, reinsurers will contribute towards the reinsured's expenses that are incurred in the settlement of claims (adjusters' fees etc). Normal practice is that the reinsurers will pay their share of any costs incurred in the settlement of claims under the policy, provided that these have arisen solely as a result of the claim and are not part of the reinsured's day to day office expenses (such as the salaries of permanent employees). However, some larger companies now employ full time loss adjusters and legal advisers. These are 'costed out' within the company, so that each division within the company pays for the service it receives. Companies that do this argue that the in-house specialists are cheaper than employing outside companies to adjust and settle their claims and that such internal 'billings' are a legitimate claims settlement expense. The argument that reinsurers should, therefore, pay a proportion is generally accepted by the reinsurance market.



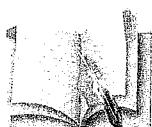
## 2.1.2 Excess of Loss (non-proportional)

Using the same example, a company might choose to pay the first £1,000,000 of each loss affecting that risk, so if there were a loss for £1,500,000 the reinsurers would not pay 90% of it, but only the amount that exceeds £1,000,000, ie £500,000 or 33.33% of the original loss.

Most losses that affect property (and many other types of risk) are only partial. Therefore, it follows that in paying the first £1,000,000 of each loss, the insurer is likely to pay far more than 10% of all losses affecting that risk.

The insurance industry has built up statistical tables to show what percentage of all loss payments relate to individual losses at varying percentages of the original insured values. Reinsurers do not charge pro-rata of the original premium for providing excess of loss coverage because they are far less exposed to partial losses than the original insurer, who is picking up the bill for the more frequent small losses. Instead, the reinsurers charge a percentage of the original premium, calculated by reference to a table of 'first loss discounts'.

First loss policies are a feature of direct insurance, where the insured is reasonably certain that he could never suffer a loss for the full value of the insured property. Normally, if property is insured for less than its full value, a condition known as 'average' would apply in the event of a loss. For example, if the property value is £10,000,000, but it is only insured for £5,000,000, the insurers would apply average in the event of a partial claim and would only pay 50% of each claim.



**The reasoning behind this is that, as the insured only purchased insurance for 50% of the true value (thereby only paying 50% of the full premium), he had effectively chosen to insure himself for 50% of the risk.**

However, if the same insured were to declare the correct value to the insurers, but take out a policy for only half the full value, the insurers could charge the premium based upon the full value and then give the insured a discount for the 'top' 50% of the risk (which the insured is keeping for himself). This is called a first loss insurance because the insurers will pay the first £5,000,000 of each loss and will not apply the condition of average.

This typical first loss scale shows, for the sake of simplicity, the figures increasing in stages of 10% of the insured value. In practice, the figures will go up in 1% increments or smaller:

Percentage 'First Loss' to 'Declared Full Sum Insured'	Premium as Percentage of Original Gross Rate
10%	54%
20%	66%
30%	75%
40%	80%
50%	83%
60%	85%
70%	87%
80%	91%
90%	95%

In our example, the insured has only bought insurance for up to 50% of the declared full value and would, therefore, only pay 83% of the premium he would have been charged for a full value insurance.



**In effect, insurers are saying that an excess of loss coverage for 50% in excess of the first 50% would be worth 17% of the 'full value' premium.**

Similar scales are used in excess of loss reinsurance. If the insured had taken out a full value policy for £10,000,000 and the insurer had decided to pay all losses up to £1,000,000, the insurer could then decide to buy excess of loss reinsurance for £9,000,000, the excess of £1,000,000 representing 90% excess of 10% of the original insured values.

In theory, the reinsurance premium would be around 46% of the original premium and the insurer would keep 54% of the original premium for undertaking to pay the first £1,000,000 of each loss sustained.

The reinsurance premium should be applied to the original premium net of the acquisition costs incurred by the insurer in obtaining the business, because the scale applies to the 'pure risk premium'.



**It should be stressed, however, that different reinsurers are likely to use different scales and, of course, the element of competition may lead a reinsurer to discount his rate more heavily than the scale would suggest.**

You will notice from the following specimen slip that there is no ceding commission. This is because the reinsurance premium no longer follows the original rating. In effect, the reinsurer builds the commission into the reinsurance premium. Bear in mind that a first loss scale will only hold good if the original rating is adequate. If the reinsurer feels that the original rate is only 50% of the correct rate for the risk, he is likely to double the original rate before applying his excess of loss rating factor to arrive at his quotation of the reinsurance premium.

The following is a typical slip for an excess of loss facultative reinsurance. Once again, this is to illustrate the principle and so is not in the MRC format.

Broker's reference: F13246

Type: Fire, lightning and explosion reinsurance, as original

Form: Full policy

Insured: ABC Textiles Limited

Reinsured: XYZ Insurance Company Limited

Period: 12 months at 1<sup>st</sup> January 2012

Interest Building, machinery and contents of the insured's textile mill

Sum Reinsured: £9,000,000 ultimate net loss, each and every loss excess of  
£1,000,000 ultimate net loss, each and every loss

In respect of an original sum insured of £10,000,000, divided as follows:

Buildings:	£3,000,000
Machinery	£4,000,000
Stocks	£3,000,000

Situation: Warrington Road, Derby, England

Conditions: Ultimate Net Clause:

Premium: £8,280 adjustable at 36.8% of original gross premium

Brokerage: 10% of gross premium hereon

Information: Factory in operation since 1987  
No known or reported losses as at  
DD/MM/YYYY  
Original gross rate: 2.25‰ (per mille).

You will see that the reinsurance rate relates back to the original gross premium. To arrive at 36.8% we have taken the original acquisition costs as being 20% of the original premium. Therefore, the pure risk premium is £22,500 ( $2.25\% \times £10,000,000$ ) less 20% = £18,000.

We have then applied the 46% figure from the scale to arrive at £8,280, which represents 36.8% of the original gross premium of £22,500.

The reason that the reinsurance premium is adjustable is that the original premium may be adjusted during the period of the policy, which you may wish to do if stock values are declared monthly, for example.



**In practice, underwriters might load the excess of loss premium to allow for their own expenses, profit margin and the amount paid to the broker for introducing the business.**

The most important factor in an excess of loss reinsurance is the Ultimate Net Loss Clause, which governs how the reinsurance will operate. There are many variations of this clause, but the following is a typical example.

## 2.2 Ultimate Net Loss Clause

*The term 'ultimate net loss' shall mean the sum actually paid by the reinsured in respect of any loss occurrence including expenses of litigation, if any, and all other loss expenses of the reinsured (excluding, however, office expenses and salaries of officials of the company) but salvages and recoveries, including recoveries from other reinsurances, shall first be deducted from such loss to arrive at the amount of liability, if any, attaching hereunder.*

*All salvages, recoveries or payments recovered or received subsequent to any loss settlement hereunder shall be applied as if recovered or received prior to the aforesaid settlement, and all necessary adjustments shall be made by the parties hereto.*

*Nothing in this clause shall be construed as meaning that a recovery cannot be made hereunder until the reinsured's ultimate net loss has been ascertained.*

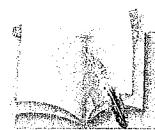
There has been a great deal of legal argument over the words 'actually paid' appearing in this clause. Traditionally, the view was taken that the words should be taken literally, which meant that the insurer had to pay the loss and could only then recover from his reinsurers. However, it has been argued that this could lead to a situation in which reinsurers, faced with a large loss, could simply refuse to pay in the hope that the insurer would go into liquidation as a result.

The case of *Charter Reinsurance Co Ltd v Fagan (1996)* established that, in the event of the insolvency of the insurer, the company's liquidator will have full rights to reinsurance recoveries, even if the claims are unlikely to be paid in full to the original insureds, by virtue of the liquidation. The reinsurers will, despite the wording, also have to pay in the absence of insolvency.



**Of course, the claim must be valid under the original policy, as well as under any separate conditions applicable to the reinsurance contract.**

The other aspects of this clause deal with the establishment of what, precisely, constitutes the ultimate net loss to the reinsured. If, for example, the reinsured had pro-rata reinsurance for 50% of the risk, the recoveries under that reinsurance would be deducted from the ultimate net loss, even if some of the reinsurers could not, or would not, pay their share for whatever reason. Legal fees, adjusters' fees etc could be treated as part of the original claim, but not the office expenses of the reinsured or the salaries of the reinsured's staff.



**However, remember the comment under pro-rata reinsurance about companies who use the services of in-house adjusters and legal departments.**

## **2.3 Treaties**



**Facultative reinsurance is expensive to administer because each risk must be individually negotiated and each claim must be individually collected from the reinsurers.**

Leaving aside historical accuracy, let us say that somebody had the bright idea of combining a number of different risks of similar characteristics, placing them all with one reinsurance market and generally streamlining the accounting and claims processes.

A facultative 'lineslip' is one way of doing this and many are still placed today. This is an agreement between a ceding company (direct insurer) and one or more reinsurers. Usually, the leading reinsurer will agree to all declarations to the cover on behalf of his fellow reinsurers. These kinds of agreement take many forms. Some may stipulate that every reinsurer must agree all risks that are declared to the cover, and others may provide for renewals of existing risks to be agreed automatically provided there have been no major changes and no major losses.

Reinsurance agreements are like fingerprints. No two are identical.

Other kinds of facultative facility include the 'broker binder', where the broker may bind risks on behalf of underwriters provided they fulfil certain criteria. Broker binders are quite often used in direct insurance, particularly motor business in the United Kingdom, but there are also examples of broker binders in the field of reinsurance.

Treaties are strict agreements by the reinsurers to accept any risk underwritten by the ceding company, provided it falls within the treaty terms.

In almost every case, the ceding company is also obliged to cede every risk coming within the scope of the treaty.



**The ceding of risks only happens in the case of pro-rata business. Excess of loss treaties protect the reinsured against the occurrence of an event of a certain magnitude, and will be discussed later in this chapter. The term 'reinsured' refers to the direct insurer who is protected by reinsurance, and is a more appropriate term than 'ceding company' when talking about excess of loss reinsurance. However, the terms 'reinsured', 'ceding company', 'reassured' and 'client' are all used interchangeably in the reinsurance world.**

Treaties, therefore, are reinsurance agreements that are, for the most part, binding upon both the reinsured and the reinsurers, to protect a certain type of insurance business, underwritten by the reinsured. In a similar manner to facultative reinsurances, they fall into the categories of pro-rata and excess of loss but, because we are dealing with large numbers of risks of different sizes and characteristics, these broad categories are further subdivided.

### 2.3.1 Pro-rata Treaties

Sometimes referred to as 'proportional treaties', these fall into three main types:

- Quota share
- surplus
- facultative obligatory.

#### Quota Share Treaties

These are agreements where the reinsured is obliged to cede and the reinsurer is obliged to accept a fixed percentage of all risks falling within the treaty terms. In the vast majority of cases, there is a maximum limit on the amount that may be ceded.

For example, if the reinsurers are committed to accept 90% of up to £1,000,000 per risk, everything is very simple for all risks whose insured value does not exceed that figure. However, if the reinsured has a risk where the sum insured is £2,000,000 he must reinsurance 50% of it elsewhere, so that the Quota Share Reinsurers will only receive 90% of £1,000,000, representing 45% of the original sum insured.

Reinsured:	XXX Insurance Company, Barbados
Period:	Continuous contract, subject to 3 months notice of cancellation to 31 <sup>st</sup> December of any year. Terms hereon from 1 <sup>st</sup> January 2012.
Type:	Quota share treaty
Class:	All fire and allied perils business written by the reinsured in its fire department, including burglary when written in conjunction with fire, whether direct or by way of facultative reinsurance.
Territorial Scope:	Barbados and Barbadian interests abroad, where incidental
Limit:	To take a 70% quota share of up to BD\$10,000,000 sum insured any one risk. Reinsured retains 30% subject to excess of loss protection, if required.
Rate:	Original gross rates
Commission:	37.5% but 30% for catastrophe perils
Brokerage:	2.5% on gross ceded premiums
Profit Commission:	25% (5% reinsurers' expenses. Deficits carried forward a maximum of 3 years). Profit commission calculation shall exclude catastrophe perils premium.
Premium Reserve:	Nil
Loss Reserve:	Nil

Portfolio:	Premiums: 35% Outstanding Losses: 100% Annual clean-cut basis, at the reinsured's option.
Cash Loss:	BD\$2,000,000 for ceded share
Accounts:	Quarterly
General Conditions:	Excluding treaty and excess of loss reinsurance. Nuclear Energy Risks Exclusion Clause (Reinsurance) NMA 1975(a). Aggregate cession limit BD\$10,000,000,000 for 70% ceded share.
Wording:	As expiring. Any amendments to be agreed.
Information:	Information package dated 15 <sup>th</sup> November 2011 seen by reinsurers. Estimated premium income 2012: BD\$70,000,000 for ceded share. Approximately 30% of total premium is in respect of catastrophe perils.



**Note the emphasis on specifying that amounts in the treaty are for the 70% ceded share, rather than 100%.**

A confusing situation can arise with quota share treaties if all interested parties are not absolutely clear about the amount they are protecting. Sometimes, a broker might receive an order to place 70% of the treaty. He has the option of placing lines totalling 70% of the 100% limit, or lines totalling 100% of the 70% limit. If the broker places lines totalling 70% the client might take this as being 70% of the 70% quota share. He might then award the other 30% to another broker or place it directly himself. The broker may be under the impression that his 70% order is based on the 100% limit, and the contract will then be over placed. The opposite may also occur, leaving the reinsured with insufficient cover.

## **Surplus Treaties**

A surplus treaty is an agreement that covers all insured risks that have sums insured above a specified amount. The maximum amount that may be ceded to a surplus treaty in respect of any single risk is governed by the retention of the ceding company. The retention (the amount kept by the ceding company) is also known as the company's 'line', which may be either gross or net.

Where a company uses a quota share treaty, a 'gross line' is the 100% amount ceded to the quota share treaty (including the ceding company's retention proper).

If the company has an underlying quota share treaty with a 100% limit of £1,000,000 and a surplus treaty with a limit of 10 gross lines, the effective limit of the surplus treaty is £10,000,000. However, for the surplus treaty to take the full £10,000,000 there would need to be a full cession of £1,000,000 to the quota share treaty. The original sum insured would also need to be £11,000,000 or more.

If, because of some condition in the quota share treaty, it could only take £500,000 for 100%, the surplus treaty could only take up to £5,000,000. Similarly, if the sum insured were £6,000,000 and the quota share treaty took £1,000,000, the surplus treaty could only take 5 gross lines because that is all that would be left.

In the majority of cases, the retention of the ceding company is governed by a table of limits that grades risks according to their perceived degree of hazard. For example, a residential risk, such as an apartment block of first class construction, may be regarded as the best type of risk from the point of view of fire hazard. The retention on such a risk would, therefore, be 100% of the agreed maximum. However, a sawmill constructed of timber might be considered such a poor risk that the allowable retention according to the table of limits might only be 10% of the agreed maximum.

Going back to the £1,000,000 quota share treaty, the maximum amount that the company is allowed to cede in respect of such a sawmill would be only £100,000 and, consequently, the maximum cession to a 10 gross line surplus treaty would be £1,000,000.

Companies frequently do not have a quota share treaty at all. In such cases, the limits of their surplus treaties would be expressed as

numbers of 'net lines', one 'net line' being the amount retained by the ceding company on a particular risk.

The following slip would be typical. An example in MRC format is shown in Appendix 8.

Reinsured:	XXX Insurance Company, Barbados
Period:	Continuous contract, subject to 3 months notice of cancellation to 31 <sup>st</sup> December of any year. Terms hereon from 1 <sup>st</sup> January 2012.
Type:	First surplus treaty
Class:	All fire and allied perils business written by the reinsured in its fire department, including burglary when written in conjunction with fire, whether direct or by way of facultative reinsurance.
Territorial Scope:	Barbados and Barbadian interests abroad, where incidental
Limit:	To take up to 10 gross lines of up to BD\$10,000,000 per line, sum insured any one risk. Maximum cession hereto BD\$100,000,000 sum insured any one risk, surplus to the reinsured's quota share treaty.
Rate:	Original gross rates
Commission:	35% but 30% for earthquake
Brokerage:	2.5% on gross ceded premiums
Profit Commission:	25% (5% reinsurers' expenses. Deficits carried forward a maximum of 3 years). Profit commission calculation shall exclude earthquake business.
Premium Reserve:	Nil
Loss Reserve:	Nil

Portfolio:	Premiums: 40% Outstanding losses: 100% Annual clean-cut basis, at the reinsured's option.
Cash Loss:	BD\$2,000,000 for treaty share.
Accounts:	Quarterly
General Conditions:	Excluding treaty and excess of loss reinsurance. Nuclear Energy Risks Exclusion Clause (Reinsurance) NMA 1975(a). Aggregate cession limit BD\$40,000,000,000
Wording:	As expiring. Any amendments to be agreed, leading underwriter only.
Information:	Information package dated 15 <sup>th</sup> November 2011 seen by reinsurers. Estimated premium income 2012: BD\$100,000,000

It would be usual to combine the quota share and surplus treaties into one slip, or at least place the two in conjunction. In such circumstances the profit commission would normally be based upon the combined results of the quota share and surplus(es).

### **2.3.2 Facultative Obligatory Covers**

A facultative obligatory cover may seem like a contradiction in terms. The word 'facultative', as we have already discussed, implies an option. In this context this means that the ceding company has the option of whether to cede risks to the cover or otherwise. 'Obligatory' refers to the obligation of the reinsurers to accept whatever risks are ceded, provided they fit in with the terms and conditions of the cover itself.

Cessions to a facultative obligatory cover need not bear any relationship to the level of the ceding company's retention. Therefore, in the case of a sawmill, where the quota share cession is £100,000, a 10 line surplus treaty could only accept £1,000,000 even if the treaty limit for top quality risks were £10,000,000.

However, a facultative obligatory cover with a limit of £10,000,000 could accept that amount on a sawmill just as easily as on an apartment block.

This sums up the difficulties of placing facultative obligatory covers. A facultative obligatory cover is usually capable of taking much more of the hazardous risk than the surplus treaty, but it will receive less of the better quality risks, which are usually gobbled up by the underlying quota share and surplus treaties. This usually results in such covers having a low premium income in relation to the maximum cession limit, so that when a large loss does occur, it takes away the profits of many good years.

Here is a typical slip:

Reinsured:	XXX Insurance Company, Barbados
Period:	Continuous contract, subject to 3 months notice of cancellation to 31 <sup>st</sup> December of any year. Terms hereon from 1 <sup>st</sup> January 2012.
Type:	Facultative obligatory treaty
Class:	All fire and allied perils business written by the reinsured in its fire department, including burglary when written in conjunction with fire, whether direct or by way of facultative reinsurance.
Territorial Scope:	Barbados and Barbadian interests abroad, where incidental
Limit:	To take up to BD\$100,000,000 sum insured any one risk
Rate:	Original gross rates
Commission:	30%
Brokerage:	2.5% on gross ceded premiums
Profit Commission:	Nil
Premium Reserve:	Nil

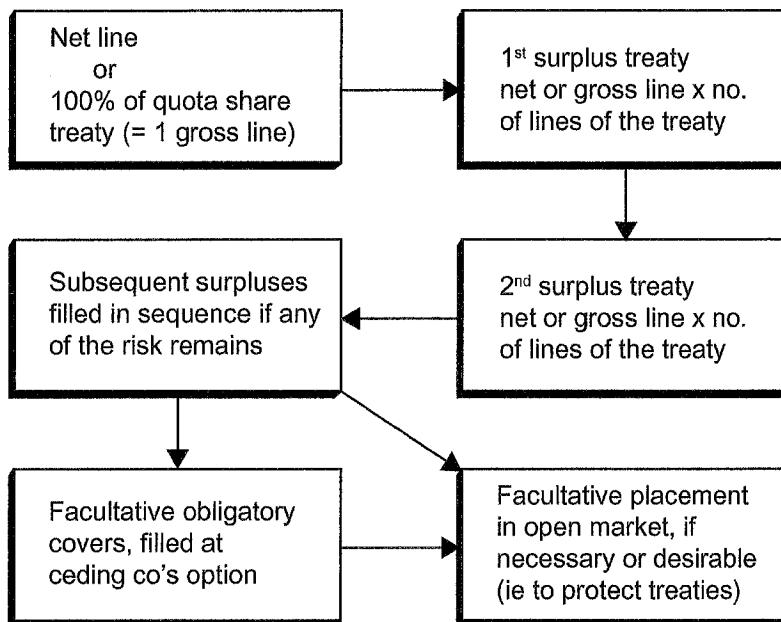
Loss Reserve:	Nil
Portfolio:	Premiums: 40% Outstanding Losses: 100% Annual clean-cut basis, at the reinsured's option.
Cash Loss:	BD\$2,000,000 for treaty share
Accounts:	Quarterly
General Conditions:	Excluding treaty and excess of loss reinsurance. Nuclear Energy Risks Exclusion Clause (Reinsurance) NMA 1975(a). Aggregate cession limit BD\$3,000,000,000
Wording:	As expiring. Any amendments to be agreed, leading underwriter only.
Information:	Information package dated 15 <sup>th</sup> November 2011 seen by reinsurers. Estimated premium income 2012: BD\$25,000,000 for ceded share.

## **2.4 Cessions to Treaties**

Cessions to pro-rata treaties begin by the ceding company establishing its retention for the risk in question. This retention or 'line' may be either gross (involving a quota share treaty) or net. The retention for the risk is usually governed by a table of retentions (sometimes known as a 'line guide'), which classifies risks according to the degree of hazard. For fire and allied perils business, this can mean occupancy (the insured's activities), construction and location (where there are differing levels of catastrophe hazard).

Having established the retention, the treaties are 'filled' in sequence until the sum insured has been fully allocated over the treaty programme. If the capacity of the treaty programme is less than the sum insured, the company may then seek facultative reinsurance for the balance.

The sequence for filling the treaties is:



Once the cessions to each treaty are established they are converted into percentages of the risk in question. Each treaty will then receive that percentage of the premiums and will pay the same percentage of any claims that may occur under the policy.

## 2.4.1 Special Considerations

The structure shown is quite simple, although typical of many small companies' treaty programmes. However, there is great variety in the structure and operation of reinsurance programmes.

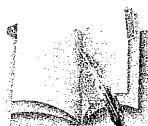
### **Basis of cession**

So far we have talked about ceding risks based upon the original sum insured. There are several other ways of making cessions to treaties.

### **Top Location and Pro-rata Basis**

This is, in practice, how a sum insured treaty operates. Many insured risks are not confined to a single location. A modern industrial risk may be made up of multiple locations. The value of the highest

valued location ('top location') may be only £10,000,000, but the value of the entire 'schedule' may be many times that figure. In such circumstances, a treaty with a capacity of £10,000,000 sum insured, any one risk, could absorb the entire policy. The cession would be made based upon the sum insured at the top location and the same percentage would be ceded of all the lesser locations.



**This is preferable to trying to cede each individual location separately because certain items may be difficult to allocate between separate locations (eg floating stock items, moveable plant, profits etc).**

## **PML Basis**

PML stands for 'probable maximum loss'. This is an assessment made by a surveyor as to the worst loss which, in his opinion, the risk would sustain. It usually assumes that at least some of the risk prevention measures, such as fire walls and sprinkler systems, are operational. If a treaty programme is designed to accept risks on a PML basis and has a limit of £10,000,000 PML, then a risk with a sum insured of £20,000,000 may be fully ceded to the treaty provided its PML does not exceed 50% of the total sum insured.

Treaties that accept cessions on a PML basis usually contain a condition that the PML used in calculating the treaty cession will not fall below a certain figure. Minimum PML figures are typically in the region of 25-50% so that, in the case of a 25% minimum PML, the treaty could only accept up to 4 times its PML limit, based on the sum insured of any one risk. This would prevent a cession of £1,000,000,000 being made to a treaty with a £10,000,000 limit, if a risk should only carry a 1% PML.



**PML figures have been known to be seriously underestimated, as was the case with the famous explosion loss at Flixborough in the early 1970s. A figure of around 15% had been proposed, but the plant was totally destroyed in the explosion, causing significant damage to neighbouring property.**

If the treaty is on a PML basis and the policy covers multiple locations, the principle of 'top and pro-rata' is applied to the PMLs of each location. Here, the cession to treaties would be based on the

highest PML, which is not necessarily the location with the highest insured values.

### **Per Policy Basis**

This is often seen on marine cargo treaties and is a response to the fact that many different cargoes, belonging to a variety of insureds and covered by several insurers, possibly bound for different ports, may all end up on the same vessel at a given time. Some insurers find it impossible to know, with any certainty, how much exposure they have on a particular vessel. This kind of treaty gives the insurer the comfort of unlimited protection for its commitments on any vessel, although the insurer still has to be careful about the accumulation of retentions, which is usually taken care of by excess of loss protections.

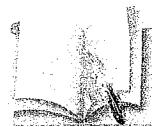
### **Per Bottom Basis**

This also refers to marine cargo treaties. A ‘bottom’ is any kind of vessel or other carrying conveyance. On such treaties, the ceding company is obliged to maintain records of their commitments on each vessel. This is often difficult to achieve in many cases as even the consignee does not always know which vessel his cargo is on until after it has arrived. Transshipment, in which a cargo is transferred from its original carrying vessel to another vessel in mid-voyage, is a common practice. This can make the job of monitoring per-vessel accumulations even more difficult. Consequently, it is far more common for marine cargo treaties to have their limits expressed in terms of a maximum per policy, shipment or consignment.

### **Per Vessel Basis**

This is used for marine hull treaties. Cessions are made based upon the insured value of the hull and machinery. A marine hull policy does not only cover the hull and machinery. It can also include liability for collision, ships’ crews’ personal effects, employers’ liability, etc. This can give rise to a single loss of more than the treaty limit if a claim involves more than one section of an original policy.

Where a fleet of vessels is covered by one policy, it is often the practice to cede each vessel separately to make full use of the treaty capacity.

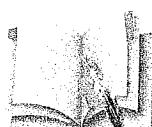


This is an aspect of marine market practice that differs considerably from its non-marine counterpart. If the treaty limit applies per vessel, the reinsurers will expect a full cession of each vessel under a policy. Non-marine practice allows the cession to be made based upon the value of the largest individual risk in the policy schedule, with pro-rata of lesser valued risks.

### Per Person Basis

Personal accident treaties (or treaties with a personal accident section) are usually limited to a maximum sum insured per person. This is based upon the 'capital sum' for the person concerned (ie the sum payable in the event of the insured's death). There is usually a further limit within the treaty for 'known accumulations' (eg five times the 'per person' limit.) This is designed to limit the reinsurers' maximum exposure on a single aeroplane, ship or vehicle.

Normally, groups of people in a single building are not regarded as known accumulations for reinsurance purposes. Also, known accumulations relate to group personal accident policies covering one insured organisation. In such cases, it is usual for the original policy to contain an accumulation limit per aircraft or other conveyance.



It would obviously be impossible for an insurer to know about a situation in which two of its policyholders had several employees on the same aeroplane, or if a number of individual insureds were travelling together. These are examples of unknown accumulations that could give rise to catastrophic losses to both the insurer and its reinsurers. This is precisely why reinsurance is necessary for a personal accident portfolio.

Having established the percentage of a risk to be ceded to the various proportional treaties, the cession percentages are then maintained throughout the policy period. However, the sum insured may be increased during the period of the policy and this could cause the treaty limits to be exceeded for that risk. There are several ways to deal with such a situation:

- The ceding company could recalculate the cession percentages from the effective date of the increase. Any losses occurring on or after that date would be allocated using the new percentages

- the treaty may contain a condition allowing for such increases in original policy limits, after they have been ceded. Typically, a maximum increase of 10% above treaty limits would be allowable
- the ceding company may build a safety margin into its cession strategy, so that only 90% of the treaty limits are utilised at the beginning of each policy period.

## 2.5 Distribution of Premiums and Claims over a Proportional Programme

When ceding a risk to treaties, the first thing to do is to establish the company's retention by referring to a table of retentions that grades risks according to occupancy, construction and catastrophe zone.

**Specimen Table of Retentions (Simplified)**

<b>Occupancy</b>	<b>Construction</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>A</b>	100%	80%	70%	60%
<b>B</b>	80%	70%	60%	50%
<b>C</b>	70%	60%	50%	40%
<b>D</b>	60%	50%	40%	30%

### Occupancy

This refers to the type of risk. For example, apartments or condominiums might appear under Category A, while a Category D occupancy might be an oil refinery.

### Construction

This refers to how the insured buildings are made. For example, Class 1 would refer to buildings made of steel and concrete. A wooden building would be regarded as Class 4.

Therefore, on a Category A risk of Class 1 construction, the company would take a maximum retention, but on a Category D risk of Class 4 construction, the company would only retain 30% of its normal maximum retention.

## Retention

This can be either gross or net. If the company uses a quota share treaty the retention may be expressed as a gross amount, meaning the 100% amount ceded to the quota share treaty. This is then known as a 'gross line'. Cessions to the surplus treaties are then based on this gross line.

For example, if the limit of the quota share treaty is \$1,000,000 for 100% and the first surplus treaty has a limit of 10 gross lines, the surplus treaty can accept up to \$10,000,000 for a Category A risk of Class 1 construction, but it would only be able to accept up to \$3,000,000 for a Category D risk of Class 4 construction.

If there is no quota share treaty the company's retention is known as a 'net line'. The surplus treaty limits are then expressed as numbers of net lines.

## Facultative Obligatory Cover

This has a monetary limit per risk, independent of the company's retention. Therefore, if a company had a facultative obligatory cover, with a limit of \$10,000,000, it could cede \$10,000,000 in respect of a Category D risk of Class 4 construction, as well as a Category A risk of Class 1 construction.

## Practical Exercise 1

A company has the following programme:

Treaty	Details	100% limits
Quota share treaty	30% retained	1,000,000
1 <sup>st</sup> surplus	10 gross lines	10,000,000
2 <sup>nd</sup> surplus	10 gross lines	10,000,000
Facultative Obligatory Cover		10,000,000

The company uses the specimen table of retentions given above.

Allocate the following risks over the above treaty programme and distribute the premiums and claims in the same proportion as the sum insured.

1. Occupancy Category: A  
Construction Class: 1  
Sum insured: \$25,000,000  
Premium: \$50,000  
Claim: \$35,000
  
2. Occupancy Category: C  
Construction Class: 3  
Sum insured: \$20,000,000  
Premium: \$58,000  
Claim: \$39,000
  
3. Occupancy Category: B  
Construction Class: 3  
Sum insured: \$15,000,000  
Premium: \$38,000  
Claim: \$350,000
  
4. Occupancy Category: A  
Construction Class: 3  
Sum insured: \$18,000,000  
Premium: \$36,000  
Claim: \$15,000



# **Chapter 3**

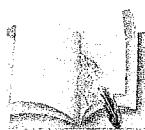
## **Treaty Reinsurance – Financial Aspects**

A reinsurance treaty is, in effect, a financial arrangement between the ceding company and one or more reinsurers.

It may also be regarded as a form of business partnership in which the ceding company uses its local knowledge and resources to underwrite a book of business that it shares with its reinsurers.

The ceding company may be underwriting many risks on a daily basis and frequently paying claims. It would be a cumbersome exercise to distribute the moneys to the reinsurers on an individual transaction basis so an account would be issued to the reinsurers (or reinsurance broker) summarising the transactions for a given period.

Treaty accounts are usually issued every three months, but some treaties may specify half-yearly or annual accounts.



**A treaty account statement will show the total amount of premium that has been collected on behalf of the reinsurers, as well as the reinsurers' share of all claims payments. However, premiums and claims are not the whole story and a reinsurance treaty accounts statement will often contain many other accounting provisions that are directly related to the conditions stipulated at the time the treaty was placed.**

Provisions may include some or all of the following:

### **Credited to the Reinsurers**

- Premiums, net of returns and cancellations
- premium reserve released
- loss reserve released
- interest on reserves
- premium portfolio incoming
- loss portfolio incoming
- refund of cash losses.

### **Debited to the Reinsurers**

- Ceding commission
- tax on premiums
- premium reserve retained
- loss reserve retained
- paid claims
- premium portfolio withdrawal
- loss portfolio withdrawal
- profit commission.

Many of the items shown under the credit section can appear as debits and *vice versa*. For example, the premiums ceded during the period of the account might be negative if there have been large returns of premium due to, for example, the cancellation of some policies. In this case the premium will be debited to the reinsurers, while the corresponding items of commission, tax and premium reserve retained will be credits rather than debits.

Similarly, there may be large claims recoveries because of salvage or subrogation, which may result in a net refund of claims to the reinsurers.

### **3.1 Premiums**

Whenever the ceding company underwrites an individual risk it must establish how much of the risk it can bear for its net account. This retention is decided by reference to the company's table of limits, which takes into account certain factors concerning the quality of the risk. Factors include:

- The type of property covered
- the use to which it is put
- construction standards

- risk protection measures
- location
- etc.

Having established the level of its retention, the ceding company makes a cession to the treaties. The cessions to the various treaties (and facultative reinsurances where applicable) are converted into percentages of the original policy limits. Each treaty is then credited with its percentage share of all premiums charged under that policy. These premium allocations are entered by the ceding company into a register of cessions and, at the end of the specified accounting period, the premiums from this register are totalled and credited to the reinsurers in the technical accounting statement.



All premium transactions are dealt with in this way. An insurance policy will often be taken out for a period of one year and a single premium will be charged at the beginning of the year. In other cases, however, premiums are slightly more complex. For example,

a commercial or industrial concern may take out an insurance to cover all of its property against the risks of fire and allied perils. This property may include stocks of raw materials and finished goods whose amounts and values fluctuate seasonally. It is common practice to insure such items on a monthly declaration basis. The insured may pay an initial premium based on an average anticipated stock value (ie the total of the estimated monthly stock values for the coming year, divided by twelve).

Alternatively, the premium may be initially taken at 75% of the highest anticipated value. The insured will then submit to the insurer declarations of the value of the stocks on a given day each month. At the end of the period, the insurer will calculate the average of the twelve monthly declarations and apply the premium rate to the resultant figure. If the premium calculated in this way is higher than the deposit premium charged at the beginning of the year, the insured will be charged an additional premium. If it is lower, some premium will be refunded.



**There are many other ways in which premium transactions may take place in respect of a policy, either during the policy period or shortly after it has expired, and the reinsurers will be debited or credited with their share of all of these in the corresponding technical account.**

## **3.2 Commission**

Ceding commission is the amount the reinsurers pay to the ceding company for introducing the business. It is often calculated as a flat percentage of the premiums ceded to the reinsurers, net of returns and cancellations. Sometimes, however, it is calculated on a sliding scale governed by the loss ratio of the treaty. The loss ratio is the percentage of the incurred losses over the gross ceded premiums.

A typical sliding scale commission may look like this:

*40% commission at a loss ratio of 50% or less, reducing by 0.5% for every 1% increase in the loss ratio to 30% at a loss ratio of 70% or greater. Provisional commission 35%.*

**Definitions:****Loss Ratio**

*The percentage of incurred losses to gross earned premium for the period under consideration.*

**Incurred Losses**

*The reinsurers' share of paid losses, debited to them during the period under consideration, less the incoming loss portfolio transfer plus the outgoing loss portfolio transfer.*

**Gross Earned Premium**

*The reinsurers' share of the gross premiums ceded to them during the period under consideration, plus the incoming premium portfolio, less the outgoing premium portfolio.*

Sometimes the definitions may vary. For example, the above calculation would apply to a treaty that is 'clean-cut'. Other treaties may operate on an underwriting year basis, where portfolio transfer provisions do not apply. In such cases, incurred losses may be defined as paid plus outstanding losses, while earned premiums will be the ceded premiums, less a provision for the unearned portion of the premiums at the end of the year.

Some sliding scale calculations will be adjusted annually until all liabilities for the period in question have been discharged. Others may specify a 'once-and-for-all' calculation for each annual period of the treaty. There is often a provision that, if the loss ratio for a particular year is unusually high, an agreed amount of losses will be carried forward to the calculations for subsequent years, until the loss ratio returns to a certain level.

**There are many variations used in these calculations.**

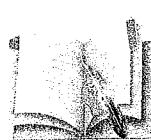


### **3.3 Tax**

Reinsurers are expected to pay their share of any taxes levied upon premiums that the ceding company receives. It should be noted, however, that the reinsurers are not responsible for any part of other taxes the ceding company may be liable for, such as corporation tax on the company's profits. In some countries, the fire brigade is funded either by a levy on premiums or by a kind of tax on premiums (known as fire brigade charges). Fire brigade charges are recognised as a legitimate deduction for which reinsurers may be debited with their share. However, the ceding company may simply charge a separate levy and pay it directly to the local authority, without putting it through the reinsurers' books.

### **3.4 Premium Reserves**

Premium reserves are a common feature of proportional treaties, although their original function is often overlooked. Originally, premium reserves were put into treaties to protect the ceding company against the inability of the reinsurers to pay claims. The reasoning was that, if the ceding company retains from the ceded reinsurance premiums sufficient to cover the unexpired liability of policies in force, then in the event that the reinsurers become insolvent or are unable to pay claims for some other reason, the ceding company could purchase new reinsurance with the retained premium or meet the reinsurers' share of future claims out of the premium reserve it was withholding.



In other words, premium reserves were designed as a form of security against the non-performance of reinsurers. Many reinsurers argue that there is no longer a justifiable reason for holding on to their money, because in many cases the reinsurance company may have many times the assets of the ceding company. Even Lloyd's underwriters, who are not capitalised in the same way that companies are, may argue against having premium reserves withheld from them because they are already contributing large amounts to various premium trust funds and are, therefore, effectively putting up reserves twice.

Many national governments require that insurance companies operating within their jurisdiction maintain a certain level of premium reserve to cover their own unexpired liabilities. Some governments go further and stipulate that all foreign reinsurers must allow their ceding companies to retain premium reserves at a specified level. In some countries there is a two-tier system for premium reserves. Licensed or admitted reinsurers are recognised as properly funded, reserved and regulated. They are, therefore, not required to grant further reserves to ceding companies in that country. However, foreign reinsurers who are not licensed or admitted must deposit premium reserves with the ceding companies.

It is clearly advantageous to any ceding company to retain premium reserves as they provide an additional source of funds that may be invested. In recent years, there has been a move against granting premium reserves, unless the reinsurers are required by law to grant them. It is recognised that this is an attractive provision from the point of view of the ceding company and, in a softening market, some reinsurers may start to grant reserves as a way of attracting or retaining business.

Reinsurers may sometimes supply the ceding company with a letter of credit (LOC) instead of providing reserve in cash. A letter of credit is a kind of promissory note, issued by a bank, that guarantees that, if the reinsurer should default, the bank will pay the ceding company up to the specified amount. The advantage of this to the reinsurer is that he pays a flat fee to the bank for the service and retains the rest of the money himself. This is acceptable provided that the ceding company plays fairly and does not immediately 'call' the LOC. If the LOC is 'called' the issuing bank must immediately pay the called amount to the beneficiary (in this case the ceding company), without investigating the circumstances of the call, and will debit the reinsurer's account immediately.



This rarely happens in practice, but insurance policies are available to protect the reinsurers against the financial effects of unfair calling.

### **3.5 Loss Reserves**

Loss reserves have exactly the same purpose as premium reserves, in that they are intended to secure the ceding company against the possible non-performance of the reinsurers. Loss reserves cover losses that have already occurred but have not been paid by the ceding company as at a particular date (usually the anniversary date of the treaty).

Again, national governments often require any insurance company within its jurisdiction to constitute a reserve for losses that have occurred but which are, as yet, unpaid. Some governments place a requirement upon the insurance company to obtain from their reinsurers their share of such outstanding losses.

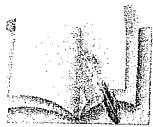
Loss reserves may sometimes be inflated by a factor called 'IBNR', meaning incurred but not reported. This refers to the fact that, at any given date, there may be losses for which the ceding company (and in turn its reinsurers) may be liable, that have already occurred but of which the ceding company presently has no knowledge.

The amount of IBNR is likely to be relatively small for simple classes of business, such as fire, because insurers will usually be aware of most losses within a few days of their occurrence. However, some liability policies may incur losses that only come to light several years after the occurrence.



**The methods of calculating IBNR are many and complicated. They are often the result of the ceding company's experience of a particular class of business, based on observations of how the incurred loss position of their account develops over time.**

The important thing is that the ceding company should be consistent in its approach to calculating IBNR when it is including it in its loss reserve that is withheld from the reinsurers. If the ceding company wishes to introduce any change in its method of calculation it should discuss the matter with its reinsurers and obtain their approval. Few reinsurers are prepared to allow IBNR unless it is a legal requirement.



**Both premium and loss reserves are useful, not only for the ceding companies who have the use of the money they are withholding, but because they are also viewed by some governments as useful ways of slowing down the movement of currency abroad.**

### 3.6 Interest on Reserves

As the ceding company is holding on to its reinsurers' money in the form of premium and loss reserves, reinsurers often demand interest at a specified rate. These rates were typically between 2.5% and 5% when interest rates in the wider world were in excess of 10%, but it is highly unlikely that these sorts of rates would be achievable in 2012.



**It should be stressed that both premium and loss reserves in treaties are now largely a thing of the past.**

An often overlooked factor is the effect of currency devaluation on the value of reserves retained. A twelve month delay in receiving 40% of a premium could render it virtually valueless by the time it is received. It should also be noted that premium reserves are taken on gross premiums. In other words, if the treaty conditions stipulate 40% ceding commission and 40% premium reserve, the reinsurers will only receive 20% of the ceded premiums during the first year.

Reinsurers sometimes stipulate that reserves must be constituted in hard currency, such as \$US, to protect them against the effects of devaluation of the ceding company's national currency.

### 3.7 How Reserves are Accounted

Taking the example of a new treaty, with premium reserves taken at 40%, loss reserves at 100% of the outstanding losses at the anniversary date, and interest calculated at 4% per annum, the treaty account might look like this:

**Year 1**

<b>Period</b>	<b>Item</b>	<b>Debit</b>	<b>Credit</b>
1 <sup>st</sup> Quarter	Premium		100,000
	Premium res. retained	40,000	
2 <sup>nd</sup> Quarter	Premium		120,000
	Premium res. retained	48,000	
3 <sup>rd</sup> Quarter	Premium		90,000
	Premium res. retained	36,000	
4 <sup>th</sup> Quarter	Premium		60,000
	Premium res. retained	24,000	
	Loss res. retained	23,000	
5 <sup>th</sup> Quarter	Premium		50,000
	Premium res. retained	20,000	
	Premium res. released		40,000
	Interest		1,600
6 <sup>th</sup> Quarter	Premium		10,000
	Premium res. retained	4,000	
	Premium res. released		48,000
	Interest		1,920
7 <sup>th</sup> Quarter	Premiums returned	1,000	
	Premium res. retained		400
	Premium res. released		36,000
	Interest		1,440
8 <sup>th</sup> Quarter	Premiums		200
	Premium res. retained	80	
	Premium res. released		24,000
	Loss res. released		23,000
	Interest		1,880
	Loss res. retained	12,000	

In this example we can see that the loss reserve at the end of the first year was 23,000 and that this amount was debited to reinsurers in the fourth quarterly account. It was refunded to reinsurers one year

later and reinsurers received the annual rate of interest on the money that had been withheld. However, at the end of the second year, there were still outstanding losses under the treaty and so a new loss reserve figure was constituted.

We can also see that, throughout the second year, the policies ceded to the treaty were still generating premium transactions, all of which need to be reflected in the reserve account. The reserving process would need to continue until the reserve account has a zero balance. Only the amounts of reserve retained and released form part of the reserve account. The premiums and interest items would appear in the technical account only.

### **3.8 Losses**

Whenever the ceding company pays a claim to one of its policyholders it will calculate the share payable by its reinsurers based upon the same percentages it used when calculating the reinsurers' share of the premium for that policy. These amounts will be entered into a register of paid losses and incorporated into the next technical account that is sent to the reinsurers. The ceding company will include any amounts that it has had to pay to loss adjusters, solicitors and other professionals in connection with the claim, so that the reinsurers will pay their share of such claims expenses. Similarly, if the ceding company subsequently recovers a part of the claim by virtue of salvage or subrogation, the reinsurers are entitled to their share of these recoveries.

#### **Salvage**

This means the residual value of the damaged property. Once an insurer has paid a claim in respect of damaged property, the property is then owned by the insurer, who may dispose of it how he wishes. This is usually by way of a salvage sale, although sometimes the policyholder may take back the damaged goods and the original claim payment is adjusted accordingly.

#### **Subrogation**

This occurs when the insurer pays a claim to its policyholder even though another person may be legally liable for the loss. After paying the claim, the insurer is entitled to take over the legal rights of the

policyholder and may then sue the party who was responsible for the loss. Any amount recovered in this way, net of legal fees, should be shared with reinsurers in proportion to their liability.

### Contribution

This is similar to subrogation and occurs when the policyholder has a number of policies that could pay his claim. Insurance policies normally contain a proviso that, if there are other policies in force covering the same interest, all policies should contribute towards any loss. Reinsurers reasonably expect to share the proceeds of any contributions from other policies that might result in a reduced claim to the policy they are reinsurance.

## 3.9 Cash Loss Refunds

Let us imagine a treaty that commences on 1<sup>st</sup> January and has a provision for quarterly submission of technical accounts within 60 days of the close of the quarter. Settlement is by the debtor party within a further 30 days.

If the ceding company had to pay a claim on 2<sup>nd</sup> January, it would not be able to collect the money from its reinsurers for almost another 6 months (90 days after the close of the first quarter).

If the amount involved is large, this could put a severe strain upon the company's cash flow.

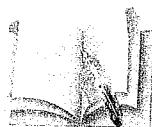


**Given that the whole purpose of reinsurance is to protect the company's balance sheet, it is clearly not the reinsurers' intention to starve the company of cash flow when a large loss occurs.**

To prevent such a situation from arising, many treaties contain a provision known as 'cash loss', where the reinsurers agree that claims payments above a certain amount may be debited to them immediately, not saved for the next technical account. This can, in theory, result in a time saving of 6 months when reimbursing the ceding company for single large claim payments.

Reinsurers require a full refund of the cash loss payment to be reflected in the next technical account, while at the same time the

claim amount should appear within the paid losses item of the same account.



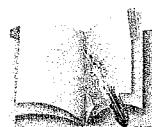
**This may seem like a complete waste of time, given that, usually, the cash loss refund is simply a corresponding and opposite entry to the amount included in the paid losses item. In other words, the two amounts cancel each other out in the technical account.**

This is basically a London market practice designed to ensure that all transactions under the treaty are recorded somewhere within the technical accounts. It is a common cause of misunderstandings between London brokers and their overseas clients, and often leads to reconciliation problems due to different ways of handling, as described in the following example.

On 5<sup>th</sup> March, the ceding company pays a large claim. The share of the treaty reinsurers amounts to \$1 million and the ceding company requests a cash loss collection from its London broker. The broker contacts all of the reinsurers and, within 10 days, has collected \$230,000, which it remits to the client. Over the next two weeks, the broker collects further amounts of \$10,000, \$3,400 and \$12,800 on various dates, which it remits periodically to the ceding company. The ceding company prepares its account on 31<sup>st</sup> March and includes the full amount of the cash loss within the paid losses. Some time later, the ceding company pays the balance of the technical account to the broker and, in doing so, refunds any cash loss payments it has received. This seems totally logical to the ceding company because it cannot see the logic in returning any moneys it has not received.

The problems arise in the broker's books because:

1. The London market requires that a full cash loss refund should be shown in the next technical account after the cash-call. The broker will usually attempt to comply by adjusting the technical account.
2. Some payments made by the broker may not have been received or reconciled by the ceding company at the time the latter settles its fiduciary account to the broker.
3. The broker may find it hard to identify which reinsurers' payments are being refunded.



While many overseas ceding companies are baffled by the logic of the London market way of handling cash losses, they should have nothing to fear from it. In effect, the claims entry and the refund cancel each other out, leaving the original cash loss call still to be collected from any late paying reinsurers. Having said that, brokers should also remember that they are providers of a service, and that they should adapt their service to the needs of their clients, rather than the other way round.

### 3.10 Premium and Loss Portfolio Transfers

To understand this concept we must first examine the method of accounting that makes it necessary. There are two basic methods of accounting under a proportional treaty.

#### 3.10.1 Clean-Cut versus Underwriting Year Basis

Traditionally, proportional treaties have been regarded as continuous contracts with a specified anniversary date. The annual periods between anniversary dates are known as 'underwriting years'.

If, for example, a treaty is arranged so that each underwriting year runs from 1<sup>st</sup> January to 31<sup>st</sup> December, all policies that commence between those dates will belong to that particular underwriting year. Therefore, it is quite possible that a policy could be issued on 30<sup>th</sup> December 2011 and still be in force on 29<sup>th</sup> December 2012 (in fact, some classes of business, such as contractors' all risks, may have policy periods spanning many years). All premium and claims transactions on original policies are deemed to belong to the underwriting year in which the individual policies commenced, irrespective of when the actual transaction takes place.

Underwriting Year Basis

2010	2011	2012
12 Month Policy		
Starts 1 <sup>st</sup> July 2010	Expires 30 <sup>th</sup> June 2011	
Loss occurs 1 <sup>st</sup> March 2011		Loss settled 1 <sup>st</sup> April 2012 (Paid by 2010 reinsurers)

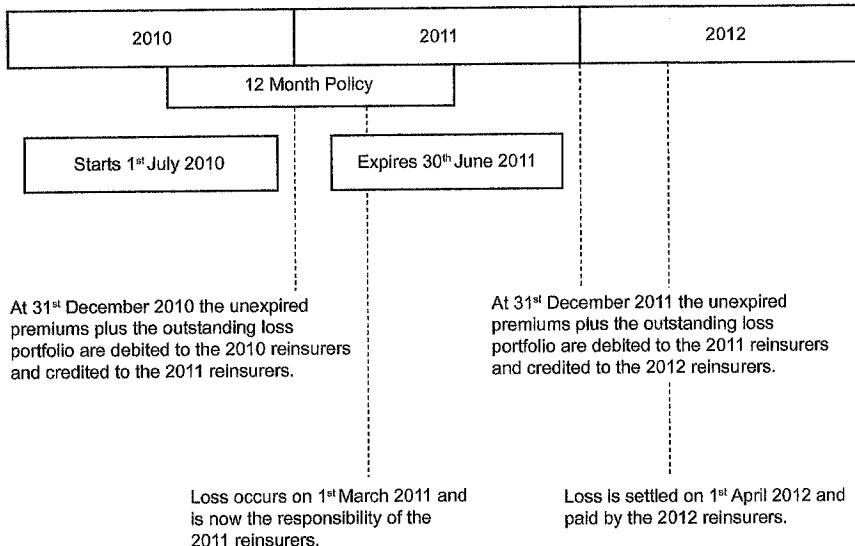
In this example, an original policy of twelve months duration commenced during the 2010 underwriting year. The premium would probably be accounted to reinsurers in the third quarterly account of 2010. Although the loss occurs in 2011, the settlement process could take several months and final settlement might not occur until some time during 2012. In this case, as the claim is settled in April 2012, it would probably be debited to the reinsurers in the second quarter of 2012. On an underwriting year basis, however, all transactions relating to policies commencing during an underwriting year must be separately identifiable from the transactions of policies starting in other years.

In other words, if the treaty commences in 2010, there will be four quarterly accounts issued in 2010. In 2011 there could be eight quarterly accounts; four applying to the 2010 underwriting year and four for 2011. Similarly, in 2012, there could be twelve quarterly accounts.

In fact, there will continue to be accounts issued in respect of the 2010 underwriting year for as long as there are any financial transactions on policies that commenced during 2010.

Considering the length of time that some claims take to be settled, there can be a great number of accounts for each underwriting year and this can create a significant administrative burden. For treaties covering certain types of business, there is an alternative accounting method that is far easier to administer. This is known as the ‘clean-cut’ method.

### 3.10.2 Clean-Cut Basis



In the above example all policy periods still running beyond the anniversary date of the treaty are effectively cancelled and re-underwritten into the next treaty year. The reinsurers of the 'old' year give back a portion of the premiums, representing the unexpired periods of all policies ceded to the treaty. The 'new' reinsurers would receive these 'unexpired premiums' and would then be responsible for any new claims that occur. Similarly, if there are any claims outstanding at the anniversary date of the treaty, these will be paid by the 'old' reinsurers to the 'new' reinsurers, who will then reimburse the ceding company when the individual claims are settled.

This exercise is known as 'portfolio transfer', and a treaty that is subject to an annual portfolio transfer of both unexpired premiums and outstanding claims is known as a 'clean-cut treaty'.

### 3.10.3 Calculation of Unexpired Premiums

In a perfect world, it should be easy to calculate on a daily pro-rata basis the exact amount of premium for the unexpired portion of every ceded policy at a given date. For example, if the treaty year runs from 1<sup>st</sup> January, any ceded policy that begins on that date (and runs for 12 months) will expire on 31<sup>st</sup> December. There would, therefore, be no unexpired premiums on such policies.

Similarly, policies that commence on 2<sup>nd</sup> January will not expire until the day after the end of the treaty year. In other words, 1/365<sup>th</sup> of the premiums from such policies will be unexpired. If we wanted to transfer the unexpired portion of those policies to a new group of reinsurers, we would need to take 1/365<sup>th</sup> of the premiums from the ‘old’ reinsurers and give it to the ‘new’ reinsurers, who would then become responsible for any claims that occurred on the last day of the policy period.

It should be relatively straightforward to perform a similar calculation for every policy that is ceded to the treaty, to arrive at a fair amount of premium to represent the unexpired policy periods. However, in the days before widespread use of computers this was a cumbersome exercise and complications can arise when there are some policies with periods of more or less than one year, or when some policies are amended by premium alterations in mid-period.



If some method that makes the calculation of the unexpired premiums easier can be employed, any slight inaccuracies produced by such a method would be more than compensated by its time savings when compared to the complicated daily pro-rata calculation.

### The 1/24<sup>ths</sup> System

The earliest attempt to simplify the unexpired premium calculation was the 1/24<sup>ths</sup> system. This assumes that all policies that commence in a particular month will have an average commencement date of the middle day of that month. So, for example, all policies that commence during January are taken as having an inception date of 16<sup>th</sup> January. At the end of December, these policies will, ‘on average’, have a half of one month still to run. In other words, the unexpired premiums from all of January’s policies will be 1/24<sup>th</sup> of the total premiums on policies starting in January ( $\frac{1}{2} \times \frac{1}{12}$ ). The February policies will all be assumed to have started on 14<sup>th</sup> February so at the end of December these policies will have one and a half months still to run. One month is 1/12 of a year and 1/2 of a month is 1/24<sup>th</sup> of a year, so the unexpired premiums for the February policies are taken as 3/24<sup>ths</sup> of the February premiums.

It is easy to perform these calculations on the premiums of every month, ending with December, in which 23/24<sup>ths</sup> of the

premiums are taken as unexpired. The unexpired premiums for each month are then totalled, treaty commission and tax is deducted, and the resulting amount is taken away from the 'old' reinsurers and given to the 'new' reinsurers.

Note that the premium portfolio withdrawal is made net of commission and taxes at the commission rate applicable to the 'old' year, even if the commission rate changes from one year to the next. This is a market convention because commission rates may go up or down between treaty years. It is, therefore, necessary to standardise a procedure so that the effects of such fluctuations cancel each other out.

There is a very good reason why premium portfolio transfers are made on a net basis rather than based on gross premiums. The commission that reinsurers pay to the ceding company is partly a reimbursement for the expenses incurred by the ceding company in underwriting the business. The ceding company is normally competing for business in a local market and the original business frequently comes from brokers or agents. The local brokers are free to use any licensed insurance company in the market and will direct its clients to the company that will pay him the best commission. The ceding company must, therefore, know at the beginning of the year how much commission it can pay to its brokers and agents for any particular class of business. As the ceding company will be paying the brokers a fixed rate of commission on each policy, it cannot afford the uncertainty of potentially having to bear a reduction in treaty commission in the next treaty year and having, in effect, to refund some of the treaty commission on the unexpired liabilities. In other words, treaty commission levels are an important part of the budget process for the business plan of the whole underwriting year.

### The 1/8<sup>ths</sup> System



The 1/8<sup>ths</sup> system is a further development of the 1/24<sup>ths</sup> system. If we accept that the potential for inaccuracy in the 1/24<sup>ths</sup> system is more than offset by the administrative savings, we are beginning to move away from the concept of proportional reinsurance being an exact science, and towards the idea that 'near enough is good enough'.

If it is reasonable to assume that all policies starting in a particular month will have an average starting date in the middle of the month, we can reasonably extend the logic to say that all policies starting in a three month period (or quarter) will have an average starting date in the middle of the quarter. In other words, business starting in the first quarter of the year will have an unexpired portion at the end of the year equivalent to a half of the quarter's premiums. A half of one quarter is  $1/8^{\text{th}}$  and so we can assume that  $1/8^{\text{th}}$  of the first quarter's premiums will be unexpired at the end of the year. Business that starts in the second quarter will be assumed to expire midway through the second quarter of the following year. Therefore, at the end of the year, one and a half quarters of the second quarter policy premiums will be unearned. One and a half quarters can be expressed as  $3/8^{\text{ths}}$ . The third quarter will have  $5/8^{\text{ths}}$  unexpired at the end of the year and the fourth quarter will have  $7/8^{\text{ths}}$ .

Again, the quarterly unexpired premiums will be totalled at the end of the year. Commission and taxes will be deducted at the rate applicable to the old year, and the resulting amount will be taken from the 'old' reinsurers and given to the 'new' reinsurers. There is often no change to the panel of reinsurers from one year to the next so the portfolio withdrawal and the portfolio entry are for identical amounts, and are just a book entry.

### **A Fixed Percentage**

We could also assume that all policies that start in a given year will have an average inception date in the middle of the year and that, at the end of the year, roughly 50% of the written premiums will be unexpired. Bearing in mind that premium portfolio transfers are made net of commission, we can arrive at a net figure by deducting the commission percentage from 50% of the year's premium. For example, if the commission for the treaty is set at 40% then 50% less 40% of 50% comes to 30% and we could therefore withdraw 30% of the year's gross premiums from the old reinsurers, and pass the same amount to the new reinsurers, who would then take on the unexpired policy periods.

In practice, commissions vary between treaties and some reinsurers like to take into account any bias in the original business. For example, some companies might renew a large portion of their policies on 31<sup>st</sup> December, while others might renew more on

1<sup>st</sup> January. If the treaty year runs from 1<sup>st</sup> January to 31<sup>st</sup> December, having a large number of policies starting on 1<sup>st</sup> January would mean that the unexpired premiums, in real terms, would be much less than 50%. Conversely, if large numbers of policies begin on 31<sup>st</sup> December, the unexpired premium figure could be much higher. Figures of between 30% and 45% are commonly used in treaties and, once agreed upon, the figure is rarely ever changed, even if the treaty commission changes from one year to the next.

The 1/24<sup>ths</sup> and 1/8<sup>ths</sup> systems are still in use, although the flat percentage is now much more popular.

### **3.10.4 Special Circumstances**

There are questions that frequently arise with regard to the operation of Portfolio Transfers.

#### **What if the quota share percentage changes?**

A portfolio transfer is designed to transfer the unexpired liabilities from one group of reinsurers to another. When a ceding company has a quota share treaty it takes a percentage for itself, known as the retention. Therefore, as far as the quota share treaty is concerned, the ceding company is just another reinsurer.

If the retention changes from 10% to 20% between one year and the next, the ceding company will pay away 10% of the outgoing portfolio amounts and will take back 20% of the same 100% amounts. After the portfolio transfer is completed the ceding company will be liable for 20% of all amounts due from the quota share treaty, even though at the time some of the original policies were underwritten the ceding company only had a 10% share.

It can be deduced that a ceding company can make a short term improvement in its cash flow position by increasing its retention, particularly if there are some large outstanding losses at the time the portfolio transfer is made. However, it would be foolish to increase the retention beyond safe limits simply to obtain some short term finance.

## **What if a reinsurer's share changes?**

A reinsurer's share may change from one year to the next. The reinsurer may benefit in the short term by having a larger share of the incoming portfolio than the outgoing. The converse is equally true.

## **What if treaty limits increase/reduce?**

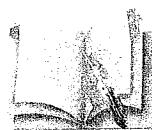
Increasing the limit of a treaty does not usually affect the portfolio transfer in any way. For example, if the treaty limit increases from £10 million to £15 million, the incoming portfolio will still be based on the old treaty limits. The problem occurs when the treaty limits are reduced. If reinsurers are accepting a treaty with a limit of £10 million, they may not be happy to receive an incoming portfolio of business with a maximum limit of £15 million. Unless the ceding company is able to recalculate each individual cession (and find reinsurance for any unexpired risks that are surplus to the new treaty limits) or the reinsurers are prepared specially to agree to the incoming portfolio at the higher limits, the portfolio transfer should be waived for that year and the unexpired liabilities of the old year should be allowed to run off naturally.

## **What if the treaty is cancelled?**

If the treaty is cancelled there is nowhere to transfer the unexpired liabilities into. In such circumstances it is usual to allow the last treaty year to run off. In other words, the reinsurers on the last treaty year will remain liable until all policies have expired and all losses have been settled. This can take several years. Sometimes the ceding company will wait until all policies have expired and most of the larger claims have been settled before offering reinsurers a final cut off in exchange for reinsurers paying a percentage of the outstanding losses.

## **How are portfolio transfers affected by premium and loss reserves?**

If a ceding company is legally required or contractually entitled to retain reserves, it stands to reason that the operation of the portfolio transfer provisions should not be allowed to diminish the amount of reserve that the ceding company is holding.



**However, the expiring reinsurers are being released from all further liability and are, therefore, entitled to receive a return of any reserves that have been withheld from them, plus any accrued interest.**

As an example, if the treaty is accounted quarterly and reserves generate interest at an annual rate of 4%, at the end of the year the first quarter's premium reserve will have been withheld for three quarters. It should be refunded to the reinsurer with 3% interest. The amount of the first quarter's reserve should be withheld from the new reinsurers, out of the incoming premium portfolio amount, and released at the end of the first quarter of the new treaty year with 1% interest. Similarly, the second quarter's premium reserve will have been withheld for two quarters at the time of transfer and the old year's reinsurers will be entitled to 2% interest. The new reinsurers will have the premium reserve amount withheld until the end of the second quarter, when they will receive 2% interest.

### **3.10.5 Example**

There is often confusion about how reserves are released when there is a portfolio transfer, particularly when the portfolio percentages differ from those of the reserves. A treaty may have a provision for premium reserves to be retained at a rate of 40% of ceded premiums, bearing interest at an annual rate of 4%. The portfolio transfer may be calculated at 30% of ceded premiums. How is this accounted?

Let us suppose that the treaty is accounted on a quarterly basis and that the ceded premiums in the four quarterly accounts of the year 2010 are \$200,000, \$400,000, \$600,000 and \$300,000. The premium reserves would then be \$80,000, \$160,000, \$240,000 and \$120,000, ie a total of \$600,000 would then be held in the premium reserve account at the end of the year.

At 31<sup>st</sup> December 2010 the total of the reserve account will be returned to the year 2010 treaty reinsurers. The first \$80,000 will have been held for 3 calendar quarters and will, therefore, attract 3% interest. The next \$160,000 has been held for 2 calendar quarters and will, therefore, attract 2% interest. The next \$240,000 has been held for only one calendar quarter and will attract 1% interest. The final \$120,000 is effectively released on the same day as it was withheld,

so the reinsurers of the 2010 treaty will not receive any interest on this amount.

To terminate the 2010 treaty reinsurers' liability at 31<sup>st</sup> December 2010, a portfolio transfer is processed. 30% of the ceded written premiums are taken from the 2010 treaty reinsurers. This comes to \$450,000 (30% of \$1,500,000). Therefore, the 2010 reinsurers will receive the return of the premium reserves (\$600,000) plus interest, minus the \$450,000 portfolio withdrawal.

The 2011 treaty reinsurers must receive the \$450,000 as an incoming portfolio entry. However, the treaty conditions (and perhaps the law) require that the ceding company must retain 40% of all premiums ceded in the preceding 12 months. The reinsurers must, therefore, be debited with the existing premium reserve of \$600,000. In this particular case a reinsurer coming on to the treaty in 2011 will suffer a negative cash flow as his reward for supporting the treaty.

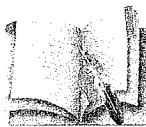
At the end of the first quarter of 2011, the \$80,000 reserve from the first quarter of 2010 will be released and paid to the 2011 year reinsurers. As this amount has only been withheld from these reinsurers for one calendar quarter, the reinsurers will receive 1% interest. Note that the 2010 year reinsurers had already received 3% interest on the \$80,000, meaning that the full interest has now been paid. At the end of the second quarter, the next reserve figure of \$120,000 will be released and the 2011 reinsurers will receive 2% interest, and so on.



**Of course, each time an account is issued, not only are the previous years' reserves released, but new reserves are being retained to maintain the reserve at 40% of the premiums ceded in the preceding 12 months.**

A similar position applies where the loss reserve and outstanding loss portfolio percentages are different. The treaty may have a provision for loss reserves to be withheld at a rate of 100% of known outstanding losses. The portfolio transfer provision may be fixed at 90% of outstanding losses. At the close of the year the reinsurers of the 2010 treaty will be debited with 90% of the outstanding losses as part of the portfolio withdrawal account. The 2011 reinsurers accept

reinsurers could be liable to pay a profit commission even though they themselves had not made any profit.

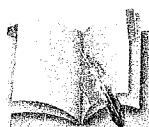


**It stands to reason that the higher the reinsurers' expenses percentage, the less profit commission will be paid. It is, therefore, in the ceding company's interest to fix this figure as low as possible.**

We can see that this particular year of the treaty is in deficit. However, much of the deficit has been brought about by the fact that there were premium and loss portfolio withdrawals at the end of the year, but there were no portfolio entries at the beginning of the year. This is because it was the first year of the treaty. The portfolio withdrawals were made to relieve the present reinsurers of future liabilities and, correspondingly, the profit commission calculation was based upon these 'finally' determined figures.

In the following year, we assume that the financial provisions of the treaty are unchanged and that the trading figures are:

Premiums ceded:	347,928
Paid losses:	134,759
Outstanding losses:	95,784



**Note that the paid and outstanding losses include any amounts paid during the current year or still outstanding, even if the losses happened during the previous year. Similarly, the premium figure includes any premiums on last year's policies that have been accounted this year.**

The profit commission calculation for this year would be as follows:

### **Income**

Premiums ceded	347,928
Premium portfolio entry at 40%	139,416
Outstanding loss entry at 90%	92,839
Total of income	580,183

### **Outgo**

Commission at 35%	121,775
Paid losses	134,759

Premium portfolio withdrawal at 40%	139,171
Outstanding loss withdrawal at 90%	86,206
Reinsurers' expenses at 5%	17,396
Total of outgo	499,307
Income	580,183
Profit for year	80,876
Deficit c/f from previous year	147,829
Final deficit	66,933

As we can see, the deficit from the previous year has been brought into the calculation, turning an otherwise profitable year into a deficit for the purpose of the profit commission calculation. As the deficit is to be carried forward to extinction, the figure of 66,933 should be carried forward into next year's profit commission calculation and so on, until the calculation results in a profit, at which time 25% of the profit will be paid by the reinsurers to the ceding company.

### Practical Exercises 2 (a) and (b) - Profit Commission Calculations

Calculate the profit commission for the third year if the figures at the end of that year are as follows:

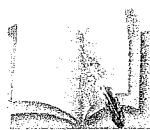
Premiums ceded:	428,394
Losses paid:	104,346
Outstanding losses:	65,987

Calculate the profit commission for the last three years, using the same figures, but taking 7.5% as reinsurers' expenses instead of 5%.

#### 3.11.1 Deficit Carry Forward

Reinsurers will often not insist that deficits are carried forward until they have been extinguished (cancelled out by profitable results), but will specify a maximum period, after which time the deficit will be ignored. Therefore, instead of seeing 'deficits carried forward to extinction', we may see 'deficits carried forward 3 years'. In such cases it is important, when compiling a profit commission statement, to show any past deficits separately, while clearly identifying the year the deficit was incurred, so that it can be ignored after its specified time period has expired.

### **3.11.2 Underwriting Year Basis**



**As you can see, the calculation of a profit commission is fairly straightforward when the treaty is accounted on an annual clean-cut basis. However, many treaties operate on an underwriting year basis, and this is where profit commission calculations may become hugely complicated.**

As an example, let us look at a fire treaty that operates on an underwriting year basis. The profit commission calculation might comprise the following elements:

#### **Income:**

- Premiums ceded during the year under review
- premium reserve brought forward from the previous year
- outstanding losses brought forward from the previous year.

#### **Outgo:**

- Commissions and taxes
- 5% of the ceded premiums as reinsurers' expenses
- premium reserve at 40% of ceded premiums
- losses and loss expenses paid
- outstanding losses at the effective date of the profit commission calculation
- deficit carried forward from any previous underwriting year, for a maximum of three years.

It is usually stated in the treaty wording that the second two items of income shall not apply to the first profit commission calculation of any underwriting year, and that the last item of outgo shall not apply to the first underwriting year of the treaty.



**However, most wordings leave us to guess at the practicalities of the actual calculation and the following will hopefully clarify the situation.**

Let us assume that we are dealing with a completely new treaty. The first anniversary date has arrived and it is time to prepare the first profit commission statement. As this is both the first year of the treaty and the first profit commission calculation of the underwriting year, we can ignore the last two items of income as well as the last item of outgo.

Our profit commission calculation is therefore similar to a clean-cut treaty:

### **Income**

Premiums ceded	348,540
----------------	---------

### **Outgo**

Commission at 35%	121,989
Paid losses	124,678
Premium reserve at 40%	139,416
Outstanding losses at 100%	103,154
Reinsurers' expenses at 5%	17,427
Total of outgo	506,664

Income	348,540
--------	---------

Deficit	158,124
---------	---------

Twelve months later we have two things to do. We need to prepare a second profit commission statement for the first underwriting year, as well as a first statement for the second underwriting year.

During the second accounting year of the first underwriting year, there were the following developments:

- A further 42,610 of premiums were accounted
- a further 84,734 of claims were paid
- the outstanding losses were reduced to 42,106.

The second statement for the first underwriting year would now include the last two items of income because we are updating last year's figures, and so it might look like this:

## **Income**

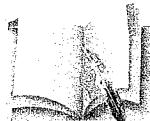
Premiums ceded	42,610
Premium reserve brought forward	139,416
Outstanding losses brought forward	103,154
Total of income	285,180

## **Outgo**

Commission at 35%	14,914
Paid losses	84,734
Premium reserve at 40%	17,044
Outstanding losses at 100%	42,106
Reinsurers' expenses at 5%	2,131
Total of outgo	160,928

Income	285,180
Profit for year	124,252
Previous deficit	158,124
Deficit for underwriting year	-33,872

When we are preparing the first profit commission statement of the second underwriting year, we must carry forward the deficit figure of 33,872 and keep carrying any deficit from the underwriting year forward into the profit commission calculations of subsequent underwriting years, either until it is cancelled out by profits or until it is effectively 'time barred' by the carry forward limitation of three or five years.



Please note that to operate this time bar it is necessary to omit the deficit from the main body of the income/outgo calculation to arrive at the pure situation for the underwriting year, and then to show any deficits carried forward underneath, separately for each underwriting year. In this way, it will be easy to see whether earlier years' deficits are being reduced or eliminated by the profits of subsequent years, as well as whether the carry forward period has expired. The problem with the calculation formula as contained in many wordings is that, if you do exactly as the formula says and incorporate any previous years' deficits as an item of outgo, you will never be able to separately identify which underwriting year any deficits relate to and could end up carrying forward the deficits to extinction.

In the third year we still need to adjust the profit commission of the first underwriting year, as well as adjusting the second year's profit commission and preparing a brand new one for the third underwriting year. It also follows that the deficit carried forward from the first underwriting year to the second will probably have changed. This will go on until all liabilities of some of the earlier years are finalised.



**This kind of system, although common, can prove to be an administrative nightmare.**

### 3.11.3 Special Circumstances

The deficit carry forward provisions can lead to further complications.

#### **What happens if we have a quota share treaty and the retention changes?**

This is straightforward. If you imagine the profit commission calculation as being done in 100% terms, ie including the retention, the ceding company is just like any other reinsurer. If they take an increased retention, say from 40% one year to 50% the next year, the same 100% figure is being carried forward as a deficit, but the ceding company is only collecting 50% profit commission instead of 60%.

#### **What happens if the shares of individual reinsurers change?**

Strictly speaking, the ceding company is entering into separate reinsurance agreements with every single one of its reinsurers and is, therefore, entitled to prepare a separate profit commission statement for each of them, bringing forward the precise monetary amount of deficit that each reinsurer has incurred in previous years. In other words a ceding company could, in theory, sustain a large loss one year, change all its treaty reinsurers the next year, and not give them the benefit of any deficit brought forward (because, as new reinsurers, they did not sustain the deficit).

In practice, most ceding companies are happy to prepare their profit commission statements on a 100% basis, ignoring the potential for gaining small amounts of profit commission at the expense of a huge workload.



**It should be said also that some reinsurers can take advantage of this situation by coming onto a treaty after there has been a major loss, thereby avoiding having to pay profit commission for a number of years.**

Some treaties, particularly covering contractors all risks business, specify that the first profit commission statement of each underwriting year may only be calculated at the end of the third accounting year. This is because the business typically ceded to such treaties consists of policies of a long-term nature, such as building projects lasting several years. It is argued that there is no point in trying to calculate the profit of an underwriting year until most of its business has expired.



**As with most matters in reinsurance, methods of calculation are infinitely variable, and a degree of common sense is required. It would be quite possible to write a whole book on the subject of profit commission alone.**

One final point about profit commission concerns the confusing terminology. Many drafters of slips and wordings will insist on using the phrase 'losses carried forward 5 years'. This is highly confusing because most people understand 'losses' as synonymous with 'claims'. It is far clearer to use the word 'deficits'.

'Management expenses' means exactly the same as 'reinsurers' expenses' and is an artificial outgo item, designed to make the profit look smaller so that reinsurers do not pay a profit commission on the whole technical profit. This is because the technical profit is not a true profit for the reinsurer as he must use some of it to pay the broker as well as his own expenses.



**An amusing story concerns an underwriter who once refused a broker's request to increase the management expenses under a treaty and insisted on reducing them!**

# **Chapter 4**

## **Proportional Treaty Wordings and Clauses**

A reinsurance treaty requires documentary evidence of the contract. In treaty reinsurance, the equivalent document to an insurance policy is the ‘treaty wording’. This details the scope of cover, the limits, the financial aspects and other issues such as the procedures to be followed in the event of the insolvency of one of the contracting parties, the outbreak of war, etc.



**Of course, different classes of business have their own particular clauses and procedures, but most wordings follow a similar layout, as you will see from the specimens in the Appendices.**

Some clauses deserve special mention.

### **4.1 Period and Termination**

Most proportional treaties are regarded as having an indefinite duration and may only be cancelled at certain dates (referred to as the ‘anniversary date’ of the contract) by either party giving notice before a certain time. For example, if the anniversary date of a treaty is 31<sup>st</sup> December of any year and the ‘notice period’ is three months, any party wishing to cancel the contract will need to notify the other party before 30<sup>th</sup> September. If neither party tenders notice of cancellation before the deadline expires, the contract will continue in force until the next opportunity to cancel, which means that one of the parties will need to give notice before 30<sup>th</sup> September of the following year, to take effect on the following 31<sup>st</sup> December.



**In practice, nearly all reinsurers give notice of cancellation to all of their ceding companies every year, to review statistical information whether they intend to cancel or not. This practice is known as ‘issuing provisional notice of cancellation’ (‘PNOC’) and is the cause of much ritual drudgery in every reinsurance broking house in London.**

The word ‘provisional’ has no legal force whatsoever. If one party gives notice of cancellation, the treaty is under notice, and either

party may regard the contract as terminated at the next anniversary date unless both parties mutually agree otherwise.

The word ‘provisional’ is used as some kind of polite statement of intent that the issuing party still wishes to consider continuing his involvement. Of course, the converse to this is when a party issues a ‘definite notice of cancellation.’ By including the word ‘definite’ the issuing party is giving the other party plenty of warning that another partner needs to be found.

However, in the contract wording there is no distinction between definite or provisional notice of cancellation. The issuance of the ‘notice of cancellation’ will allow both parties the freedom to renegotiate or cancel the contract.

It is a common misconception that one party may issue notice of cancellation, giving him the right to do what he likes, but that if the other party wants to enjoy similar freedom of action they must also give notice of cancellation. The wording usually states that the contract “*may be cancelled at the anniversary date by either party giving three months prior notice...*”. In other words notice of cancellation, provided it is given in the proper manner and as set out in the wording, means that the contract between the two parties will terminate at the next anniversary date. Any agreement made subsequently between the parties, even if it is just to agree to carry on as before, effectively becomes a new contract.

Of course, in all other ways, the contract will still be regarded as a continuation of the existing contract, for example for the purposes of maintaining the premium and loss reserve accounts or the deficit carry forward provisions of the profit commission calculation, etc.

It should be added that many companies, particularly in the London market, when signing a slip, traditionally mark their lines with the letters ‘NCAD’. This stands for ‘notice of cancellation at anniversary date’ and means that the reinsurer is telling the ceding company that his participation is annual and must be renegotiated every year. The broker has to be careful to advise his client of all lines that are subject to this provision, either at the time he confirms cover or before the annual deadline for tendering notice of cancellation.

Lloyd's syndicates do not mark their acceptances in this way and there is a difference in procedure between the marine and non-marine markets. The non-marine markets require that the broker assumes that the lines are annual only. This is entirely sensible, as each syndicate only exists as a legal entity for one year, after which it is dissolved and reconstituted. Marine syndicates, however, prefer to issue their own notice of cancellation every year and will be most upset with the broker if he gives notice of cancellation on behalf of a syndicate who has not instructed him to do so.

Most brokers clarify the situation by endorsing their slips with 'internal arrangements', which state that the broker is entitled to give notice of cancellation on behalf of all Lloyd's syndicates at each anniversary date.



**The introduction of the MRC was intended to ensure contract certainty at the inception of the contract and to eliminate small print and stamp conditions. Consequently, it is rare to see these conditions applied to underwriting stamps in the London market and the broker will usually seek to have these conditions removed and written into the subscription agreement section of the MRC.**

## 4.2 Special Termination and Reinsurer Downgrade

Special termination conditions (often called 'sudden death' clauses) have long been a feature of reinsurance treaty wordings. The clause enables either party to cancel the contract immediately in certain circumstances, such as the other party's country being involved in a war, the other party failing to comply with the contract or losing its licence to do business, etc.

The growing influence of ratings agencies such as Standard & Poor's, Moody's and A M Best means that a reinsurer's financial stability is monitored constantly. If, in the view of a rating agency, the reinsurer's prospects take a turn for the worse, the agency may well downgrade the reinsurer. It is very important to any insurance organisation to have the best reinsurance security it can possibly afford. The reinsured's own regulatory bodies will often look closely at the types

of reinsurance contract that have been placed and the quality of the security behind those contracts. A programme entirely placed with a number of reinsurers rated AA would earn the reinsured much more capital relief than a similar programme placed with a smaller number of B rated reinsurers.

A typical downgrade clause, therefore, gives the reinsured the right to cancel the participation of any reinsurer whose rating falls below a certain level after the contract has commenced. The trigger point is typically when the rating falls below A-. Some clauses include a section requiring any reinsurer that is removed due to downgrade to provide securitisation against its outstanding liabilities.

Some reinsurers resist the imposition of downgrade provisions, arguing that it places an obligation on them to set aside greater capital against the possibility of suffering a downgrade and being suddenly removed from contracts.

Cancellation due to a reinsurer downgrade requires that the reinsurer should return unearned premium to the reinsured. That is not always easy to calculate, particularly in the case of contracts that operate on a ‘risks attaching’ basis, where the annual term of the contract may have expired at the time of the downgrade, but policies that could produce claims are still in force.

### **4.3 Errors and Omissions**

This clause once featured in almost all treaty wordings, proportional or excess of loss. In recent years, however, there have been attempts to remove it from excess of loss covers. Its presence in proportional treaties is said to cater for inadvertent errors or omissions made by the ceding company when ceding risks. For example, the ceding company may have incorrectly classified the risk as being of first class construction, only to find later that the building is made of wood. The ceding company would be bound to rectify the error, but the fact that the error had been made could not be used by the reinsurer as an excuse for getting out of the contract. As excess of loss contracts do not take cessions of individual risks, but merely protect the ceding company against losses above a certain size, it is argued that the errors and omissions clause is not necessary.



However, many ceding companies feel safer with an ‘E&O’ clause in all of their contracts and some modified clauses have been introduced into excess of loss contracts to allow for certain types of errors and omissions to be made without resulting in the avoidance of the contract.

## 4.4 Self Insured Obligations

This clause basically allows the ceding company to insure itself and to cede these insurances to the treaty as if they were any other policy. When a company insures itself it has no legal liability to itself under the policy. However, many insurance companies insure, for example, their own office buildings and wish to reinsurance part of the risk in the same way as they reinsurance their other risks. Some reinsurers do not like this clause because they fear that it could lead to abuse. For example, the company might charge itself a very low premium or be very liberal with itself in the adjustment of claims.



This is a very strange fear for reinsurers to have as a reinsurance treaty is the ultimate display of good faith that a reinsurer can show to a ceding company. It therefore seems odd that, having put so much faith in the ceding company, the reinsurer should have cause to doubt the integrity of the ceding company in the matter of its own insurances.

## 4.5 Inspection of Records

A reinsurance treaty is a contract of utmost good faith, in exactly the same way as any other insurance contract. It could even be said that a treaty is often an act of blind faith, because the reinsurer rarely ever comes into contact with the details of individual risks that are ceded to him under it. The reinsurer puts his faith in the management of the reinsured company, particularly the company’s underwriters and their underwriting philosophy.

Sometimes, however, reinsurers require a little more reassurance that all is well and may wish to conduct an inspection of the reinsured’s books. The inspection may be aimed at gathering evidence for a dispute between the reinsurer and the reinsured. Fortunately, such disputes are rare and the more usual reason for an inspection is

for the reinsurer to satisfy himself that the company's underwriting procedures and internal controls are working properly. Such routine 'audits' are becoming more common practice among some of the larger reinsurance companies, and can benefit the reinsured by alerting him to any slipping of standards uncovered by the reinsurer.

There are a number of different clause wordings, but in broad terms they contain the following elements:

- The reinsurer has a right to inspect only the records of the reinsured that relate to business falling under the treaty
- the reinsurer must give reasonable notice to the reinsured
- the reinsurer may request copies of relevant documents and may be required to meet the expense of copying
- the reinsurer's inspection rights will survive the cancellation or expiry of the treaty, but only while there are any outstanding liabilities
- the reinsurer cannot use the inspection to delay settlement of any amounts due from him to the reinsured.



Naturally, reinsurers are bound by the rules of confidentiality and cannot use the information gleaned from the inspection, or any confidential information acquired through any other means, in any other context or in its dealings with any other company.

## **4.6 Arbitration**

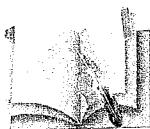
This is often the longest clause in a treaty wording and is probably the least read for that very reason.

When the reinsurer and the reinsured fail to agree on the way the treaty should operate, arbitration is the usual remedy. Arbitration is chosen in place of legal action because:

- It is cheaper
- it is quicker
- the arbitrators are insurance experts.

Usually each party nominates one arbitrator and the two arbitrators nominate an umpire. If the two arbitrators cannot agree between them, the umpire has the casting vote. The decision of the arbitration panel is final and the panel also decides on the apportionment of the cost of the arbitration.

Once the arbitration panel has delivered its decision, any award made is enforceable by the courts.



**In recent years it has been accepted that the arbitration clause is a separate agreement, whether or not it is part of the main treaty wording. This is because the clause constitutes an agreement to deal in a certain way with issues concerning the interpretation of the treaty. Arbitration could result in the setting aside of the treaty, which would then lead to a circular argument that, if the treaty is no longer in force, how can an integral part of the treaty (the Arbitration Clause) have any validity?**

## 4.7 Bordereau

This is a list of all individual cessions to a proportional treaty. There are also claims bordereaux and outstanding claims bordereaux which, unsurprisingly, are lists of paid claims and outstanding claims under the treaty.

In the early days of treaties, when a treaty was not much more than a facultative facility, reinsureds were expected to submit quarterly or even monthly bordereaux to their reinsurers, giving details of every risk ceded to the treaty, including the name of the insured, the policy number, the sum insured and how it was distributed to the treaties, and the premium, with its distribution to treaties.

These days it is rare for a treaty to contain a bordereau provision, but the same details are still kept by the reinsured in the form of a cession register, which the reinsurers would be able to inspect under the terms of the Inspection of Records Clause.



# Chapter 5

## Designing a Property Reinsurance Programme from Historical Data



**It is not very often that we design a reinsurance programme for a completely new company, where no statistical information exists.**

All types of insurance yield statistical information from which projections can be made. For the purpose of our first designing exercise we are going to take a look at a hypothetical property account.

Statistical information for the last five years is provided in the form of a 'gross account risk profile', which shows premiums, claims, numbers of risks and aggregate sums insured. This information is divided into bands according to the sum insured of each policy.

The exercise is to discuss a suitable reinsurance programme based upon these figures.

Several factors will need to be considered, such as:

### **Retention**

The retention is the amount the company can afford to lose on a single risk or in a single event. As a general rule, this figure can be around 3% of the company's paid up capital. A lower figure may be used by a new company, while an established company, with accumulated shareholders' funds, may increase this figure. Let us assume that, for the purpose of this exercise, the company feels comfortable with a maximum retention of \$250,000 per risk.

### **Table of Limits**

A proportional treaty is an obligatory reinsurance arrangement under which the reinsured makes cessions according to an agreed formula. The cession of any risk depends upon its size and characteristics.

A table of limits is often used as a way of 'grading' risks according to construction and use. For example, an office block may be considered a very safe risk, and may be regarded as Category A occupancy. However, construction standards vary, and the reinsured may have perhaps four construction standards, ranging from Class 1

(eg reinforced concrete) down to Class 4 which would represent a poor type of construction, regarded as flammable.

An office building of Class 1 construction would, therefore, warrant a full retention of \$250,000 in our example.

However, at the very bottom of the table we might find highly hazardous occupations, such as sawmills or paint manufacturers. A risk of this type may only merit a retention of 60% of the reinsured's normal maximum and, if the risk is of flammable construction, the figure might be as low as 30%.

If, at the time of underwriting, the reinsured classifies each risk according to its occupancy and construction type, it should be a simple matter to produce future statistical information, broken down in a manner that will allow reliable projections to be made concerning the effects of different reinsurance programmes upon the net results of his portfolio. It would also allow the reinsured and his reinsurers to determine whether the table of limits is a good one or whether it should be altered in some way.

Here is a simplified table of limits:

Occupancy	Construction			
	1	2	3	4
A	100%	90%	80%	70%
B	90%	80%	70%	60%
C	80%	70%	60%	50%
D	70%	60%	50%	40%
E	60%	50%	40%	30%

Having established the retention from the table of limits, the reinsured should avoid the temptation to make arbitrary changes to it when ceding individual risks.



**In the first place, it is against the spirit of a reinsurance treaty agreement. Secondly, it makes analysis of the portfolio impossible if there is no formula for anticipating the likely effects of changes to the reinsurance programme.**

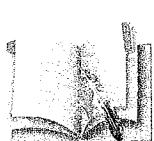
Sometimes the reinsured will have good reason to alter his retention on a particular risk, such as to reduce exposures in a particular neighbourhood. The occasional deviation is allowable under treaty conditions, where it is considered to be in the reinsurers' interests, and should not have great consequences for the projection of treaty statistics. However, if the reinsured is constantly altering retentions from those laid down in the table of limits, changes in underwriting policy are probably needed.

## Results

The reinsured will be trying to maximise his chance of making a profit.

In this exercise we will regard the reinsured's profit as:

retained premiums + reinsurance commission - retained losses - excess of loss reinsurance costs.



Of course there are many other factors in the profit equation, such as acquisition and administration costs as well as the profit commission earned under treaties and any differential between the rate of interest earned on retained premium reserves and the amount of agreed interest paid to the reinsurers. However, for our purposes these can be ignored, either because they are constant or because their amounts are not usually significant.

## Exposure

Assuming that the reinsured is going to retain up to \$250,000 on any one risk, there is virtually any number of ways to achieve this. For example, he may choose to retain up to \$250,000 for his net account and use proportional treaties for any amounts surplus to this figure. In the case of a risk worth \$1,000,000 he would keep 25% for his net account and cede 75% to the treaty. He would give his reinsurers 75% of the premium for that risk, and the reinsurers would in turn pay him 75% of all losses that he incurs.

In the second example, the reinsured decides to keep the first \$1,000,000 of each risk and protect himself against any losses that exceed \$250,000 on any single risk (he arranges 'per risk' excess of loss protection for \$750,000 excess of \$250,000).

On a risk with a sum insured of \$1,000,000, the reinsured would not be ceding any of the premium to the proportional treaty, and would not, therefore, make any recoveries from the treaty if the risk were to be affected by a loss.

The difference between the above two methods can be clearly seen in the case of a \$250,000 loss affecting the \$1,000,000 risk. Under the first example, the proportional treaty would pay 75% of the loss, while under the second example, the proportional treaty would pay nothing. Also, as the reinsured's net loss under the second example is only \$250,000, there is no recovery from the per risk excess of loss programme.

Therefore, we can see that, with proportional reinsurance, the reinsured can recover a share of every loss, no matter how small. With excess of loss reinsurance, the reinsured will only claim from his reinsurers when his claim exceeds the deductible. In other words, for the same retention of \$250,000 the second example gives the reinsured a considerably higher exposure than the first option. This exposure must be weighed up against the increase in retained premium and the cost of the risk excess of loss reinsurance.

### **Catastrophe**

Taking the two examples above, the \$1,000,000 risk would contribute \$250,000 to the reinsured's aggregate retained exposures on the first basis, but a full \$1,000,000 on the second basis. Repeated over the entire portfolio, this could result in a significant increase in retained exposures. If the business is located in a part of the world that is prone to natural catastrophes or serious rioting, this exposure must be protected or the reinsured could be wiped out by a series of losses arising out of one event. If the reinsured has more retained exposure, he will need to buy more catastrophe protection, and this will increase his costs.

### **Marketability**



**It is easily possible to design a reinsurance programme that will maximise the reinsured's chance of making a profit. However, the converse is that such a programme could maximise the reinsurer's chance of making a loss.**

Any responsible reinsurer wants to underwrite a profitable account and we must therefore design a programme that will also be acceptable to the intended market.

Unfortunately, there are no rules to tell us precisely what is acceptable and what is not.

As an example, let us look at the question of balance. By this we mean the ratio of the cession limit per risk against the estimated treaty premium income. If a treaty can accept up to \$1,000,000 of sum insured per risk and generates an overall premium income of \$1,000,000 per year, it is said to have a 1:1 balance.

There are no rules to say whether any particular balance is acceptable because there are so many variables to consider. The variables include:

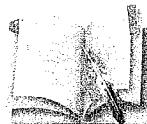
- The normal level of profitability of the account
- the territorial scope and its susceptibility to catastrophe perils
- the class of business the mix of the portfolio
- etc.

A 1:1 balance might be perfectly acceptable for a fire treaty in a part of the world that is not prone to natural disasters. However, in a seismically active region this sort of balance would be unacceptable because the profits of the good years would not be sufficient to allow reinsurers to build up a catastrophe reserve. Engineering treaties are treated differently and a 10:1 balance may even be considered acceptable by some markets.

## 5.1 Data

The ideal set of data would comprise several years' figures for the reinsured's gross account (ie before deducting any reinsurance premiums or claims). The figures would include the aggregate sums insured, premiums and claims, divided into bands of sum insured (or PML). Such 'profiles' should be prepared separately for each section of the table of limits, so that we have one profile for all policies where the reinsured normally retains 100% of his maximum retention,

another profile for policies where the retention would be 90% of the maximum, and so on. The profiles should be further broken down by catastrophe zone for parts of the world where natural catastrophe perils can occur.



**It is clear that such an exercise can result in the generation of a huge amount of data. This may be beyond the scope of many companies to prepare, but with the increasing sophistication of database programmes, the possibilities for this sort of analysis are increasing.**

For this exercise, we shall only concern ourselves with the estimation of retained premiums and reinsurance commissions, as well as the historical results of the retained portfolio and the treaties, based upon the chosen treaty structure. We must also consider the amount of retained aggregate under the chosen programme and how much catastrophe reinsurance the company should purchase.

For the sake of this exercise, we shall assume that the results given below represent the average of the last 5 years' results, loaded for inflation. We shall also assume that all risks in the portfolio are of Occupancy Category A and of Class 1 construction, located in a single catastrophe zone.

### Gross Results of the Portfolio

From	To	#	Aggregates	Premiums	Losses
1	100,000	500	25,000,000	39,252	41,250
100,001	200,000	381	56,350,251	102,870	92,480
200,001	300,000	221	53,168,324	68,524	59,389
300,001	500,000	141	54,289,132	63,450	51,250
500,001	750,000	98	67,543,200	86,724	43,267
750,001	1,000,000	78	64,254,678	67,894	36,589
1,000,001	2,000,000	63	92,345,876	104,987	74,567
2,000,001	3,000,000	24	62,347,865	65,476	36,890
3,000,001	5,000,000	12	49,785,765	51,378	24,321
5,000,001	10,000,000	4	34,567,432	36,578	0
10,000,001	20,000,000	3	48,097,865	49,876	0

The first two columns represent the minimum and maximum sums insured for each band. Therefore, any policy with a sum insured of \$50,000 would appear in the first band. '#' represents the number of policies with sums insured falling within that band. 'Aggregates' represents the total of the sums insured for all policies within that sum insured band, while the 'premium' and 'loss' figures are the total amounts for the underwriting year, applicable to the policies counted within that band.

Remember that some policies can cover several different risks, such as different locations for the same manufacturer, etc. In most cases, cessions to treaties are made on the basis of the sum insured of the highest valued individual risk. For example, a policy may cover ten locations, with the largest valued at \$1,500,000. This policy would be ceded to the treaty based upon this sum insured, even though the total value of all of the locations may be \$5,000,000.

In the above profile, the policy would be shown in the band \$1,000,001 - \$2,000,000 and the entire policy premium, as well as the total of the sums insured for all of the locations, would be put into that band. (Profiles for excess of loss covers should be prepared by individual location, if possible, for reasons that will be discussed later.)

### **Apportionment over the treaty programme**

This exercise, as usually is the case in the real world of reinsurance, is a question of best guessing. We are trying to estimate how the premiums, claims and aggregate sums insured would be apportioned over different types of reinsurance programme. To do this we must make certain assumptions, the first of which is that every policy within each band has a sum insured equal to the midpoint of the band.

For example, in the band of sums insured between \$1,000,001 - \$2,000,000 the midpoint is roughly \$1,500,000. If we are assuming that the reinsured is going to retain the first \$250,000 of sum insured on each risk we can say that, for this band of the profile, the reinsured would keep  $250,000/1,500,000$ ths of the premiums, aggregate sums insured and claims. It is then a matter of applying the same principle to all bands of the profile and adding up the results.

If the reinsured prepares another profile of risks in construction/occupancy group A2 (or B1), where the retention is 90% of the maximum, a corresponding calculation would be made by applying the fraction 225,000/1,500,000ths and so on.

Following on from this we would want to calculate the fraction of each band that would be allocated to the various treaties. Going back to the \$250,000 retention and the \$1,000,001 - \$2,000,000 band, if we assume that the first \$250,000 of each risk is retained, there is going to be \$1,250,000 of sum insured, per risk, left over, which equates to 5 times the retention. If we are looking at a first surplus treaty of 5 lines or more, we can allocate all of the remaining premiums, claims and aggregates to the treaty. However, if our hypothetical treaty only accepts up to 4 lines we must apply the fraction \$1,000,000/\$1,500,000 to the figures in the band. The remainder, after subtracting the amounts allocated to the retention and first surplus treaty, would go to the second surplus treaty, if there is one; otherwise it may be placed under a facultative obligatory treaty, or as facultative reinsurance in the open market.

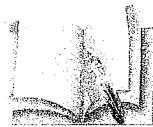
One final thing to mention, before we start to build a spreadsheet model, is the quota share treaty. If, instead of taking a simple retention of the first \$250,000 of sum insured on each risk, we take up to \$500,000 each risk, we can protect this with a 50% quota share treaty. This would alter the amount of each band that goes to the retention. In our example, we are now looking at a fraction of 50% of 500,000/1,500,000ths. Taking \$500,000 as the gross line, you can see that there are now 2 gross lines remaining, which would be allocated to the first surplus.

## **5.2 Constructing a Spreadsheet**

In the first edition, I described a spreadsheet that allocates a profile of sums insured, premiums and losses over a given reinsurance programme. Several people commented that the instructions were hard to follow and I must admit that describing how to build even the simplest spreadsheet is a daunting task. However, the 'treaty designer' spreadsheet is deliberately simple, taking no account of graded retention tables, catastrophe zones etc. This helps to keep the whole thing on one sheet. Appendix 6 contains a sample spreadsheet that you may wish to construct.

## Chapter 6

# Excess of Loss Covers



We have already come across excess of loss reinsurance as a type of facultative cover. Facultative reinsurances protect individual risks, so when we arrange a facultative excess of loss reinsurance we are protecting against individual losses whose amounts exceed a fixed threshold (known as the 'deductible' or 'priority').

Excess of loss treaties protect a large number of risks of different sizes and can be designed to perform different functions, such as:

- To protect the reinsured against large individual losses
- to protect the reinsured against an accumulation of smaller losses from a single event
- to protect the reinsured against an accumulation of losses over a certain period.

Sometimes an excess of loss programme will combine more than one of the above functions.

In many cases, excess of loss reinsurance is purchased alongside proportional reinsurance and protects the reinsured's retained account.

For example, a company may have a quota share treaty with a limit of \$1,000,000 sum insured, any one risk and a retention of 25%. Because the risks in the company's portfolio have differing sums insured, the company will not have a \$250,000 retention on every single risk. For example, on a risk with a sum insured of \$500,000 the company's maximum commitment will be \$125,000. If the company arranges an excess of loss protection with a priority of \$125,000 for any single risk, even a total loss on a \$500,000 risk would not give rise to a loss under the cover.

We can see that the company has a proportional treaty programme to provide it with underwriting capacity and has decided that the maximum amount it can pay in respect of any of its policies is \$125,000. It could have taken a 12.5% retention under the

\$1,000,000 quota share treaty, but has instead decided to take a 25% retention and protects its potential liability with a risk excess of loss treaty for \$125,000 excess of \$125,000.

The slip for such a protection might look like this:

Reinsured:	XYZ Insurance Company
Period:	12 months at 1 <sup>st</sup> January 2012 Losses occurring during basis
Type:	Excess of loss reinsurance
Interest:	Protecting the reinsured's retention of up to US\$250,000 sum insured, any one risk, in respect of all business underwritten in the reinsured's fire department, including burglary when written in conjunction with fire business.
Territorial Scope:	Bermuda
Sum Reinsured:	To pay up to US\$125,000 ultimate net loss each and every loss occurrence, any one risk Excess of US\$125,000 ultimate net loss each and every loss occurrence, any one risk
Conditions:	Ultimate Net Loss Clause Net Retained Lines Clause Reinsured to be sole judge of what constitutes any one risk Nuclear Energy Risks Exclusion Clause, NMA 1975(a) Excluding obligatory and excess of loss reinsurances War and Civil War Exclusion Clause
Reinstatement:	Two full reinstatements at additional premium calculated at pro rata to amount reinstated, irrespective of time.

Premium:	Minimum and deposit premium US\$40,000 payable in four equal instalments on 1 <sup>st</sup> January, 1 <sup>st</sup> April, 1 <sup>st</sup> July and 1 <sup>st</sup> October 2012, adjustable at 5% of the reinsured's gross net premium income accounted during the period of this agreement.
Information:	Information presentation dated 15 <sup>th</sup> November 2011 seen by reinsurers hereon. Estimated GNPI: US\$900,000

Note the way in which the cover limit and priority are worded "To pay up to US\$125,000 ultimate net loss each and every loss occurrence, any one risk, excess of ...". It is this form of words that distinguishes a risk excess of loss cover from any other kind of cover.

If the reinsured's portfolio is affected by a catastrophic loss in which several of its insured risks are damaged or destroyed at the same time, this type of cover will only pay individual claims that have exceeded the priority. The reinsured cannot add the claims together for the purpose of collecting from a risk excess of loss protection.

A 'catastrophe excess of loss treaty' is designed to respond to just such a situation, by allowing the reinsured to add together all his net retained losses from a single event to make a single excess of loss claim. A catastrophe excess of loss slip might look like this:

Reinsured:	XYZ Insurance Company
Period:	12 months at 1 <sup>st</sup> January 2012 Losses occurring during basis
Type:	Excess of loss reinsurance
Interest:	Protecting the reinsured's retention of up to US\$250,000 sum insured, any one risk, in respect of all business underwritten in the reinsured's fire department, including burglary when written in conjunction with fire business.
Territorial Scope:	Bermuda

Sum Reinsured:	To pay up to US\$875,000 ultimate net loss any one loss occurrence Excess of US\$125,000 ultimate net loss any one loss occurrence
Conditions:	Ultimate Net Loss Clause Net Retained Lines Clause Definition of 'any one loss occurrence' as per LPO 98a Two Risk Warranty Nuclear Energy Risks Exclusion Clause, NMA 1975(a) Excluding obligatory and excess of loss reinsurances War and Civil War Exclusion Clause
Reinstatement:	Two full reinstatements at additional premium calculated at pro rata to amount reinstated, irrespective of time.
Premium:	Minimum and deposit premium US\$40,000 payable in four equal instalments on 1 <sup>st</sup> January, 1 <sup>st</sup> April, 1 <sup>st</sup> July and 1 <sup>st</sup> October 2012, adjustable at 5% of the reinsured's gross net premium income accounted during the period of this agreement.
Information:	Information presentation dated 15 <sup>th</sup> November 2011 seen by reinsurers hereon. Reinsured has in force a risk excess of loss cover for US\$125,000 excess of US\$125,000 with two reinstatements, which shall be deemed to be in force at the time of any occurrence giving rise to a loss hereunder. Estimated GNPI: US\$900,000

Note the different wording of the contract limit, "To pay up to US\$875,000 ultimate net loss any one loss occurrence". In this case there is no need for the reinsured to suffer individual losses of more than \$125,000 per risk. The fact that a number of losses can be attributed to a single event means that the reinsured can add

together his net losses from the event and recover any amount that exceeds the priority of his catastrophe reinsurance programme.

Note that in this example we have taken the same amount of \$125,000 as the priority for each cover. Since a catastrophe cover is only designed to pay claims arising from a catastrophic situation (involving more than one insured risk in the same event), there should be some mechanism to ensure that the cover does not expose reinsurers to a loss on a single risk.

In our example we are assuming that both the risk excess of loss and the catastrophe excess of loss covers are in existence at the same time. If a catastrophe occurs, losses on individual risks exceeding \$125,000 each will fall to the risk excess of loss programme first. The total retained losses from the occurrence, less recoveries, if any, from the risk excess of loss cover will form the 'ultimate net loss' of the reinsured for the purpose of making recoveries under the catastrophe cover.

This is an example of how it would work in practice:

Sum Insured	Retention %	Quota Share %	100% Loss	Retained Loss
2,000,000	12.5	37.5	1,000,000	125,000
1,000,000	25.0	75.0	1,000,000	250,000 <sup>1</sup>
500,000	25.0	75.0	200,000	50,000
			425,000	
			-125,000	
		UNL	300,000	
		Priority Recovery	-125,000	
			175,000	

<sup>1</sup> Results in a \$125,000 recovery under the risk excess of loss cover.

As you can see in this example, it would not be possible for the catastrophe cover to be exposed to a loss from a single risk, because of the existence of the risk excess of loss cover. In fact, the risk cover in our example provides two full reinstatements of the limit. This means that, even if there were several losses above \$125,000 from the same event, the reinsured could make multiple recoveries from

the risk excess cover, up to a total of \$375,000. Another mechanism that is frequently used in catastrophe covers is known as the ‘two risk warranty’, which states that the catastrophe reinsurers will only be liable to pay claims when two or more insured risks are affected in the same event.



**As with all reinsurance matters, there are infinite possibilities. For example, if the same catastrophe cover existed without there being a risk cover alongside it, and without the two risk warranty, the cover would respond to both large individual losses and to catastrophe losses. The net losses of \$425,000 would not be reduced by any risk excess of loss protection and \$300,000 would be recoverable from the cover.**

In these circumstances, the cover combines the functions of risk and catastrophe covers. The cost of such a cover would be greater than for a pure catastrophe cover because it is now also exposed to losses on single risks.

While many excess of loss covers are designed to protect against abnormal occurrences, there are other covers that provide protection against an abnormal number of smaller losses accumulating over the course of a year.

### **Working Excess of Loss Covers**

These have a priority that is fixed at a low level, meaning the cover will almost certainly be affected by several losses every single year. The reinsured is protecting himself against an unusually large number of losses of this magnitude during the year. A good example of a working excess of loss cover is the first layer of a motor excess of loss programme. Because these covers anticipate a certain number of losses each year, reinsurers charge a premium that is sufficient to pay the anticipated losses, plus a further premium against the possibility of more, unforeseen losses. This is usually achieved by charging a variable rate, adjustable in accordance with the amount of losses to the cover once known. This is called ‘burning cost rating’ and is discussed in Section 7.4.

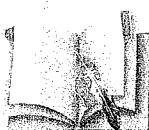
### **Stop Loss Covers**

These are sometimes referred to as ‘excess of loss ratio covers’, which is a far more descriptive term. They are most often used to

protect a crop insurance account against weather perils, usually hailstorm, where it is often the only form of reinsurance cover available. A company that underwrites a crop hail account knows that hailstorms will strike somewhere every year, but has a good idea of how much the claims are going to be in relation to its overall premium (ie the loss ratio).

For example, the annual premium from crop insurance may be around \$10,000,000 and the average losses around \$7,500,000, giving an expected loss ratio of 75%. Costs of administration and loss adjustment may be around 15% of premiums, giving the company an annual profit of 10%.

The company wants to protect itself against a bad year, which may only happen once every 20 years or so and which could push its loss ratio up to 200%.



**The job of reinsurers is not to guarantee a profit to the reinsured, but merely to reduce his risk of ruin. It would, therefore, not be possible to cover in excess of a loss ratio of 75%. A more likely figure for the reinsured's priority would be 100%.**

Let us assume that the cover is arranged to protect the reinsured for any loss amount in excess of 100% of the year's gross premium income, up to a further 100%. The cover is assumed to cost 5% of the gross premium income.

In a normal year the reinsured would pay 75% of the premiums as losses. 15% would go on administration costs and 5% on the reinsurance premium, leaving a 5% profit margin.

If the loss ratio for the year was 200%, the reinsured would recover 100% from the reinsurers. He would, therefore, have paid away 100% in losses (net of reinsurance recoveries), 15% in administration costs and 5% as reinsurance premium, leaving his account in deficit to the amount of 20% of gross premiums.

A slip for such a cover may look like this:

Reinsured: XYZ Insurance Company

Period: 2012 harvesting season

Type:	Stop loss reinsurance
Class:	To cover the reinsured's crop hail account
Sum Reinsured:	To pay all losses excess of 100% of the reinsured's gross net premium income or US\$9,000,000, whichever is the greater, up to a further amount of 100% of the reinsured's gross net premium income or US\$11,000,000, whichever is the lesser.
Premium:	Minimum and deposit premium payable in full at inception. US\$450,000 adjustable on expiry at 5% of the reinsured's gross net premium income booked in respect of all crops with anticipated harvesting dates during 2000.
Information:	Information presentation dated 15 <sup>th</sup> November 2011 seen by reinsurers hereon. Estimated gross net premium income US\$10,000,000.

As you can see in the specimen slip, the limit and the priority are expressed as percentages of the gross net premium income and also have monetary limits. The monetary figures are there to ensure that reinsurers will not be exposed too soon if the actual premium income is far less than expected. In our example the priority represents \$10,000,000 based upon the given estimate of the gross net premium income, but if the reinsured had miscalculated and only booked \$1,000,000 of premium, the reinsurers might then be exposed to losses from a single hailstorm instead of being exposed only in an unusually bad year. The existence of the \$9,000,000 minimum monetary priority will give the reinsurers some security against this while giving the reinsured a 'hedge' against a drop of up to 10% in his premium income.

Conversely, if the company managed to generate \$20,000,000 of income, the financial exposure of the reinsurers would be doubled without an upper monetary limit. The existence of the \$11,000,000 upper limit enables reinsurers to avoid this situation while allowing the reinsured a 10% margin for growth.

## ILW Contracts

An industry loss warranty is a catastrophe excess of loss contract with an important difference. The principal trigger for paying a claim is whether the sum of all insured losses paid by the entire market from a given catastrophe exceeds a certain figure. That figure (which may be many billions of dollars) is provided by a monitoring organisation that is mutually agreed at the commencement of the contract. One example is an organisation known as Sigma, which publishes data on the estimated insured loss amounts from natural catastrophes. The Japanese earthquake loss of 2011 produced estimated insured losses approaching US\$40 billion at the time of writing.

The reinsured must also have suffered losses from the event, in order to demonstrate that the reinsurance contract contains an element of risk transfer. However, an ILW contract stands to one side of the reinsured's other catastrophe programmes, rather than being just another layer of cover. The contract may cover losses from all classes of business written by the reinsured and may also include any reinstatement premiums the reinsured is liable to pay under its other programmes arising from the covered event.



**Because the ILW trigger is set at such a high level, these contracts may be relatively inexpensive. However, they tend to have large limits and are written by a single reinsurer, rather than placed on a subscription basis. For that reason, the reinsured must be careful to select only those reinsurers with a healthy credit rating and may also seek additional security from the reinsurer in the form of a letter of credit or a trust fund agreement.**



# **Chapter 7**

## **Excess of Loss Reinsurance – Financial Aspects**

An excess of loss contract is far simpler, in an accounting sense, than a proportional treaty because there are usually only three types of financial transaction, premium, loss payments and reinstatement premiums.

### **7.1 Premium**

A proportional treaty accepts percentage cessions of individual policies and therefore receives the same percentages of the premiums for those policies. An excess of loss contract is different because it protects the reinsured against losses over a certain size.

We have already seen that for facultative excess of loss reinsurances the premium is disproportionate because most losses are only partial. In fact, losses of 40% or less of the full value at risk may amount to 80% of the total of all losses.

The premium for an excess of loss contract is based upon the reinsurer's assessment of the risk he is assuming and this will depend upon a number of factors, such as:

- The maximum amount being protected (ie the reinsured's retained 'line')
- the profile of the protected account (numbers of risks within bands of values)
- loss history
- catastrophe exposure (increasingly estimated by specialist catastrophe modelling tools)
- original premium income
- the limit and deductible of the cover.

#### **Rate**

The rating calculations that the reinsurer performs will enable him to fix a premium for the contract. This premium, expressed as a

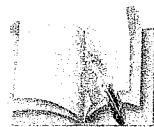
percentage of the contract limit, is known as the 'rate on line', which is often used by reinsurers in their premium calculations. The rate on line is important to reinsurers as it gives a quick indication of the payback period should the contract suffer a total loss. For example, if a contract has a limit of \$10,000,000 and the annual contract premium is \$2,000,000, the reinsurers would need to collect \$2,000,000 per year for 5 years in order to pay for a single loss of \$10,000,000.

Having formed an opinion as to the amount of premium he requires to protect the reinsured, the reinsurer will usually express the premium as a percentage rate, applied to some variable component of the business he is protecting. This variability is necessary in order to ensure that, if the reinsured's business grows, he will receive more premium for the increased exposure under the reinsurance contract.

### **Premium Income**

The most common variable to which a rate may be applied is the protected premium income. Ignoring changes in the reinsured's original premium rates, growth in the premium income usually indicates that more risks are being accepted, leading to an increase in the reinsurers' exposure under the excess of loss contract.

The term most frequently used to describe the premium income is 'gross net premium income' or 'GNPI'. A typical definition of GNPI may be found in the specimen wordings in the Appendices, but essentially 'gross' means the premiums booked by the reinsured during the contract period, without any deduction for brokerages, taxes or other expenses. 'Net' means net of the cost of any other reinsurances that have the effect of reducing the exposure to reinsurers under the excess of loss contract. In other words, we are rating the contract based upon the protected portion of the original gross premiums. Premiums paid for facultative and proportional treaty reinsurances may, therefore, be deducted from the gross booked premium to arrive at the GNPI. However, premiums paid for other excess of loss contracts should not be deducted.



This is so that, if the reinsurer is rating an entire excess of loss programme with several layers of cover, some of which may be per risk covers and others catastrophe, he will have a common income upon which to base his rates rather than having to reduce the GNPI by the amount of premium he is charging for any underlying layers.

### (Minimum and) Deposit Premium

Most excess of loss contracts have a variable premium that can only be accurately calculated after the contract has expired. It is, therefore, usual for reinsurers to charge a deposit premium at the beginning of the period and to adjust it when the variable factors are known.

Sometimes, one or more of these variables can be unexpectedly low, resulting in an unacceptably low contract premium after application of the rate. Reinsurers are effectively selling their capacity to different reinsureds throughout the year and their own capacity is limited by the size of their capital and their own reinsurance protections (retrocessions). Reinsurers, therefore, require a minimum premium for any contract that they accept, so that, even if the final GNPI is negligible, they will still receive sufficient premium to cover their own costs and exposure.

Usually, the minimum premium and the deposit premium are the same figure, but there are some instances where two different figures are specified. When the two figures are the same, we refer to a ‘minimum and deposit premium’ or ‘M&D’. Therefore, we may see a contract premium described in the following way:

*“Minimum and deposit premium US\$4,500,000, payable in four equal quarterly instalments on 1<sup>st</sup> January, 1<sup>st</sup> April, 1<sup>st</sup> July and 1<sup>st</sup> October 2012, adjustable upon expiry at 10% of the reinsured’s gross net premium income accounted during the period of this agreement”.*

Deposit premiums are frequently paid annually, half yearly or quarterly, and usually in advance. Reinsurers will often discount the deposit premium according to the speed with which they collect it. For example, if the deposit premium is to be paid in full at inception there may be a 20% discount from the estimated final contract

premium. If the premium is to be paid half yearly the discount may be only 10%, while if the premium is payable in quarterly instalments there may be little or no discount. This discount is only from the 'up front' premium. The finally adjusted premium will be the same unless the adjusted figure is much lower than expected. In such circumstances, assuming that the deposit premium was the same as the minimum premium, an 80% M&D will result in a lower contract premium than one with the same rate, but with a 100% M&D.

### **The 'Penal' M&D**

If, in the above example, the final GNPI is \$40,000,000, the 10% rate would produce an adjusted premium of \$4,000,000. However, the minimum and deposit premium was \$4,500,000 and there will, therefore, be a nil premium adjustment. In such cases, the M&D is said to be penal because the reinsured is effectively being punished for incorrectly estimating his premium. This often happens with new insurance companies that make optimistic projections for the purpose of putting together a business plan.

### **Example**

The contract limit is \$10,000,000 any one loss occurrence.

The estimated GNPI is \$50,000,000.

The required rate on line is 50%, producing a contract premium of \$5,000,000, which represents 10% of the estimated GNPI.

The reinsured might charge a minimum and deposit premium of \$4,500,000 at the beginning of the year (the inception of the contract), and adjust this at the end of the year, based upon 10% of the actual GNPI.

If, at the end of the period, the actual GNPI has risen to \$60,000,000 it usually means that the reinsured has accepted more business than he had originally estimated. The 10% adjustment rate, applied to the actual GNPI, produces a contract premium of \$6,000,000 (or a 60% rate on line), meaning that the reinsured must pay an adjustment premium of \$1,500,000 to the reinsurers in order to 'top up' the deposit premium to the actual earned premium.

## Other Variable Factors

Although GNPI is the most common variable used to adjust an excess of loss contract premium, it is by no means the only one. For example, a personal accident protection on a pension fund might be rated at 5 cents per member, based upon the average membership, measured at twelve monthly intervals. Cash in transit covers may be rated based on annual carryings, and employers' liability covers on North Sea oil rigs may be rated on the number of man days spent offshore. There is no limit to the variety of factors that may be used as a basis for rating excess of loss covers.

Another variable that is commonly used in the rating of working excess of loss covers is the amount of losses that the reinsurers sustain under the contract. This form of rating, which is retrospective in nature, is referred to as 'burning cost' and is discussed in Section 7.4.

## 7.2 Loss Payments

Loss payments are simple transactions once the ultimate net loss has been established. However, establishing the ultimate net loss is not always simple. Sometimes it is difficult even to know how many losses there have been and when the losses have taken place. There are many factors that can influence the claim collection and the following are useful examples.

### 7.2.1 'Hours Clause'

Although commonly referred to as the Hours Clause, this is actually a definition of the duration and extent of a catastrophe, which is found within a clause called 'definition of any one loss occurrence', which has a wording similar to the following:

*"For the purposes of this Agreement a loss occurrence shall consist of all individual insured losses which are the direct and immediate result of the sudden violent physical operation of one and the same manifestation of an original insured peril and occur during a loss period of 72 hours any:*

- (a) *hurricane, typhoon, windstorm, rainstorm, hailstorm or tornado*

- (b) *earthquake, seaquake, tidal wave or volcanic eruption*
- (c) *fire*
- (d) *riot or civil commotion which occurs within the limits of one city, town or village or:*
- (e) *168 consecutive hours as regards all other insured perils.*

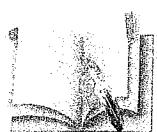
*It is further agreed that all individual insured losses which are the direct and immediate result of:*

- (i) *malicious damage which occurs within the limits of one city, town or village during a loss period of 72 consecutive hours shall constitute an individual loss occurrence for the purposes of this Agreement, as shall:*
- (ii) *any flood or floods which occur within the catchment area of any named river and its tributaries during a loss period of 168 consecutive hours, it being understood that for the purposes of this Article a flood shall mean the escape of water from its normal confines (other than tanks, apparatus, pipes and similar water containers forming part of buildings).*

*Provided that if any such aforementioned operation and physical manifestation shall directly and immediately result in the physical manifestation of another original insured peril or perils then all individual insured losses which directly and immediately result therefrom and occur during the same loss period of 168 consecutive hours or 72 consecutive hours where any of the perils mentioned in (a) (b) (c) and (d) above are involved shall be deemed to constitute a single loss occurrence.*

*The Reinsured may choose the date and time when the appropriate loss period commences provided that no such*

*period shall commence earlier than the time of the first recorded individual insured loss to which this Agreement applied resulting from the operation and manifestation of an original insured peril as aforesaid and if the operation of such a peril shall last longer than the appropriate loss period then the Reinsured may apply further appropriate loss periods in respect of the continued operation of that peril provided none of those additional periods shall overlap".*



**In other words, if the reinsured suffers a series of losses as a result of freezing winter weather conditions (a 168 hour event for the purposes of the clause) lasting 16 days, the reinsured may divide the period into several individual loss occurrences to recover from his catastrophe cover. 168 hours equals 7 days, so there appears to be a possibility of dividing the loss occurrence into 3 separate loss occurrences.**

**The question is, how can this be done in a way which is most advantageous to the reinsured?**

We should bear in mind that, for each separate loss occurrence, the reinsured will have to bear one deductible under his catastrophe programme. We should also look at the number of reinstatements available under the catastrophe programme, as well as the adequacy of the cover limit.

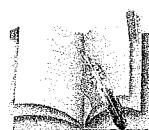
### **Practical Exercise 3 - Allocating Claims over an Excess of Loss Programme**

In this exercise, we are going to look at the possible ways of allocating a loss of several days' duration over an excess of loss programme.

The company suffers a large number of individual losses from a winter freeze. The renewal of the company's excess of loss arrangements takes place on 1<sup>st</sup> January, while the catastrophe is still in progress. The covers contain an Extended Expiration Clause, which states that, should the covers expire while a covered loss event is in progress, the entire loss event is recoverable provided that no portion of the claim from that event is claimed against next year's cover.

The catastrophe covers contain a definition of each and every loss, which states that all freeze losses occurring within a period of 168 consecutive hours shall be regarded as one loss occurrence for the purposes of making recoveries from the catastrophe cover. The company may choose when to start each period of 168 hours (7 days) provided no period starts before the time of the first recorded loss to the company and provided no two periods overlap.

The company should, therefore, decide how to divide the period into separate 7 day periods to gain the maximum recovery, net of reinstatement premiums, from its reinsurance programme.



**Please bear in mind that recoveries from the risk excess of loss programme must be deducted first.**

The amounts of each loss, net of proportional reinsurance recoveries, are as follows:

<b>Date of loss</b>	<b>Loss to net retention</b>
28/12/11	20,000
29/12/11	50,000
30/12/11	70,000
31/12/11	100,000
01/01/12	0
02/01/12	210,000
02/01/12	400,000
03/01/12	80,000
04/01/12	300,000
04/01/12	200,000
06/01/12	50,000
07/01/12	100,000
08/01/12	70,000
09/01/12	70,000
10/01/12	400,000
11/01/12	120,000
12/01/12	50,000

The company had the following excess of loss programmes:

**2011:**

Per Risk:	\$750,000 XS \$250,000 each and every loss, each and every risk Premium: \$100,000 Reinstatements: 2 at 100% additional premium
Catastrophe:	1 <sup>st</sup> Layer: \$650,000 XS \$350,000 any one loss occurrence Premium: \$40,000 Reinstatements: 1 at 100% 2 <sup>nd</sup> Layer: \$1,000,000 XS \$1,000,000 any one loss occurrence Premium: \$50,000 Reinstatements: 1 at 100%

**2012:**

Per Risk:	\$750,000 XS \$250,000 each and every loss, each and every risk Premium: \$120,000 Reinstatements: 2 at 100%
Catastrophe:	1 <sup>st</sup> Layer: \$650,000 XS \$350,000 any one loss occurrence Premium: \$44,000 Reinstatements: 1 at 100% 2 <sup>nd</sup> Layer: \$1,000,000 XS \$1,000,000 any one loss occurrence Premium: \$55,000 Reinstatements: 1 at 100%

All covers commence on 1<sup>st</sup> January.

All covers have an Extended Expiration Clause.

The catastrophe covers have a limitation per loss occurrence:

- 72 hours for wind, flood and earthquake
- 168 hours for losses from any other cause.

1. Calculate the loss recoveries from the per risk covers, as well as the reinstatement premiums.
2. Calculate the most advantageous way of recovering under the catastrophe programme, bearing in mind the provisions of the 'Hours Clause'.

## **7.3 Reinstatement Premiums**

Most excess of loss contracts are designed to pay losses above a certain size, per loss occurrence, and have a fixed maximum amount that the reinsurers can pay for a single event.



**Some contracts do not place any limitation upon the number of events that the reinsurers may be liable for. Consequently, reinsurers under such contracts have potentially unlimited liability. Such contracts are becoming increasingly rare, as reinsurers attempt to limit their liability, but are still seen in some areas, particularly in motor insurance.**

More commonly, reinsurers limit the maximum amount that the reinsurance contract can pay in the aggregate for the contract period. A common way of achieving this is to state that the contract limit applies only once during the contract period and that any losses that the reinsurers pay will erode that limit. For example, if the contract limit is \$10,000,000 any one loss occurrence, excess of \$5,000,000 any one loss occurrence, a \$7,500,000 loss would result in a \$2,500,000 loss to the cover. This would erode the cover limit, leaving \$7,500,000 available to cover future losses.

However, future losses would still be subject to the contract deductible of \$5,000,000.

The reinsured will often not feel comfortable with a single limit of liability and will wish to reinstate the contract limit to its full amount after each loss to always have the benefit of full cover.

Such reinstatements, which are usually limited in number, are subject to the payment of an additional premium to the reinsurers. This is known as the 'reinstatement premium' and is usually payable at the same time as the loss is paid by the reinsurers. The standard practice

is that the reinstatement premium is deducted from the claim payment.

Reinstatement premiums are calculated as a percentage of the basic contract premium and, if a reinstatement premium becomes payable before the contract premium has been adjusted, it will be provisionally calculated based upon the deposit premium.

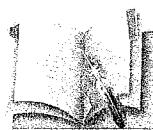
The following reinstatement conditions are common:

- At nil additional premium: The contract limit will be automatically reinstated from the time of the loss occurrence, free of charge
- At 100% additional premium: The contract limit will be automatically reinstated from the time of the loss occurrence, at an additional premium calculated at pro rata as to the amount reinstated, irrespective of time. This means that, if the loss is 50% of the contract limit, the additional premium to reinstate the limit will be 50% of the contract premium. Similarly, if the percentage additional premium is specified as 50%, a loss of 50% of the contract limit would require the payment of 25% (50% of 50%) of the basic premium in order to reinstate the contract limit to its full amount
- At pro rata to time and amount: A loss of 50% of the contract limit, which occurs 10 days before the expiry of a twelve month contract period, would require a reinstatement premium calculated at 50% of 10/365ths of the contract premium.

Reinsurers are becoming increasingly reluctant to grant reinstatement premiums with a pro rata to time factor. Their argument is that they are providing cover against losses that may occur at any time during the year. The reinstatement premium is a part of their payback calculation, so a contract with a 25% rate on line with a single reinstatement at 100% additional premium can suffer a maximum loss in a year of twice the contract limit.

In the event of a single total loss, 100% of the contract limit would become payable, so in effect the reinsurer has only lost the equivalent of 50% of the contract limit (ie the contract limit, less two premiums, each equivalent to 25% of the limit). Of course, if there is a second total loss, no further reinstatement premium is payable, leaving the

reinsurers out of pocket to the tune of 150% of the contract limit. If the reinstatement premium were to be reduced pro rata to the number of days' cover remaining, the additional premium would be anything from 100% if the loss occurred on the first day of the cover, to virtually nothing if the loss occurred on the last day of the cover.



**Note that, if reinstatements are stated in the contract, the limit must be reinstated following a loss. The reinsured cannot choose not to reinstate the contract if, for example, he suffers a loss on the last day of the contract period.**

Contracts with a high loss expectancy (and consequently a high rate on line) can give some surprising results when reinstatement premiums are considered. For example, a contract with a 60% rate on line and a \$10,000,000 limit per occurrence with one reinstatement at 100% will produce the following results:

- If there is no loss:  
\$6,000,000 profit to the reinsurers (less brokerage)
- If there is a loss of \$5,000,000 to the contract:  
\$4,000,000 profit to the reinsurers (basic premium of \$6,000,000 plus \$3,000,000 to reinstate 50% of the limit, less \$5,000,000 loss)
- If there is a \$10,000,000 loss to the contract:  
\$2,000,000 profit to the reinsurers (premium of \$6,000,000 plus \$6,000,000 to reinstate 100% of the limit, less \$10,000,000 loss)
- If there are two \$10,000,000 losses to the contract:  
\$8,000,000 loss to the reinsurers (premium \$6,000,000 plus reinstatement premium of \$6,000,000 less two losses of \$10,000,000).

Sometimes there may be a number of reinstatements of the contract limit at different levels of reinstatement premium, eg one free, plus one at 50%, plus two at 100%. These must be taken in sequence so that, if the contract limit is \$10,000,000, reinstatement of the first \$10,000,000 of losses to the contract will be free, reinstatement of the next \$10,000,000 of losses will be based on 50% of the contract premium, and reinstatement of the next \$20,000,000 of losses will be based upon 100% of the contract premium.

## 7.4 Burning Cost Rating



**It has been customary for many years to rate working excess of loss covers on a burning cost basis. What is the reasoning behind this method of rating?**

### Working Covers

The term ‘working cover’ is applied to a low layer excess of loss contract that regularly suffers losses. The best example is a motor excess of loss cover, where the reinsured’s priority is low enough to ensure that the layer will be affected by a significant number of losses each year (eg less than the value of an average vehicle or a fairly typical damages award for bodily injury or minor third party property damage).

Assuming that the protected portfolio is quite large and homogeneous, the frequency of smaller losses can be estimated quite reliably and a working layer will, therefore, be rated on the basis that a certain level of losses can be reasonably anticipated each year.

This results in reinsurers charging a premium to cover the anticipated claims (as well as their own administration costs), plus a further amount to cover the risk of incurring more than the anticipated amount of claims.

### Definition of Burning Cost

‘Burning cost’ is the rate of premium that must be charged to match the incurred losses to the layer.

For example, if the reinsured’s retained premium income is \$10,000,000 and the incurred losses to its working cover are \$1,000,000, the contract rate would need to be 10% of retained premium income for the reinsurers to break even. In this example, the 10% rate is known as the ‘pure burning cost’.



**Actually, reinsurers would argue that charging a rate of 10% in the above example would leave them in a deficit situation because they have to pay brokerage (in some cases) as well as their own administrative costs. To compensate for this, reinsurers will load the pure burning cost by a factor of 100/70, 100/75 or 100/80 to produce a ‘loaded burning cost’.**

100/70ths is probably the most common loading factor and allows reinsurers a margin of nearly 43% of the incurred losses.

Burning cost calculations are performed retrospectively, when the incurred losses to the contract are known or can be estimated. This involves charging a deposit premium at the inception of the cover and adjusting it at the end of the year when the cover has expired.

Insurance claims, particularly those involving any kind of third party liability, can take several years to settle. It is, therefore, usual to recalculate the excess of loss premium every year until all of the claims have been settled.

The following example demonstrates how the process evolves.

The reinsured requires excess of loss protection for his motor account. From the historical claims information, the protection is broken down into several layers and the working layer is established at \$700,000 excess of \$300,000 each and every claim.

The estimated retained premium income for the coming year is \$41,000,000 and the reinsurers anticipate that the layer will produce losses totalling between \$500,000 and \$1,000,000 during the year. The pure burning cost is, therefore, estimated at between 1.22% and 2.44% of the estimated retained premium income.

The reinsurers decide to rate the cover on a burning cost basis with a loading factor of 100/75ths.

A ‘minimum rate’ of 0.65% is charged. This is a fairly arbitrary figure that the leading reinsurer considers to be the minimum amount of premium he requires for the granting of reinsurance capacity. It is a way of guaranteeing that reinsurers will still receive a premium in the unlikely event that no losses affect the cover.

A ‘maximum rate’ of 3.50% is applied. This ensures that, if the eventual claims to the cover are significantly higher than anticipated, the reinsured will begin to benefit from the cover instead of paying ever-increasing premiums of 100/75ths of the claims he is recovering.

A ‘minimum and deposit premium’ is charged at the beginning of the year or in instalments at regular intervals. This guarantees that the reinsurers will receive a minimum level of premium, even if the

eventual retained premium income is considerably less than the original estimate. The minimum and deposit premium is usually calculated by applying the minimum rate to the estimated retained premium income.

The premium of the working layer may, therefore, be expressed as follows:

*“Minimum and deposit premium \$266,500 payable in four equal quarterly instalments, adjustable at 100/75ths of the incurred losses hereon, subject to a minimum rate of 0.65% and a maximum rate of 3.50% of the reinsured’s gross net premium income for the period of this cover”.*

‘Gross net premium income’ (GNPI) is the standard way of expressing gross retained premium income, and is the total of premiums accepted by the reinsured during the period of the cover, without deducting anything for commission or brokerage paid away (ie gross), less premiums paid away for other reinsurances that have the effect of reducing claims to the excess of loss programme (reinsurances that inure to the benefit of the programme).

During the first year the reinsured pays the four instalments of the minimum and deposit premium. A number of claims occur during the year, but not all of them are settled quickly. In fact, during the first year there are only three claims payments made by reinsurers, for amounts of \$10,000, \$11,125 and \$25,000.

At the end of the first year the reinsured declares his actual GNPI as \$41,856,750. Paid losses total \$46,125 and outstanding losses are declared at \$550,000 to the working cover.

The premium adjustment is:

$$\begin{array}{lll} \text{A:} & \text{Incurred losses} = 46,125 + 550,000 & = 596,125 \\ \text{B:} & \text{GNPI} = 41,856,750 & \end{array}$$

$$\begin{array}{ll} \text{Pure burning cost rate} = 1.424\% (\text{A/B}) & \\ \text{Loaded rate} = 1.424 \times 100/75 & = 1.899\% \end{array}$$

$$\begin{array}{ll} \text{Reinsurance premium} = 41,856,750 \times 1.899\% = & 794,860 \\ \text{Less deposit paid} & 266,500 \\ \text{Adjustment premium payable} & 528,360 \end{array}$$

Over the next twelve months some of the other claims are settled. Let us say that a total of \$75,000 is paid by the reinsurers. Some of the claims that are settled by the reinsured are much lower than originally reserved and we end the second year with \$250,000 of outstanding losses.

The incurred loss position is now  $\$46,125 + \$75,000 + \$250,000 = \$371,125$ .

At this point a second premium adjustment statement is prepared:

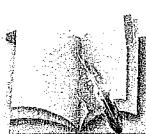
Pure burning cost rate = $371,125/41,856,750 \times 100/1$	= 0.887%
Loaded rate = $0.887 \times 100/75$	= 1.182%
Reinsurance premium = $41,856,750 \times 1.182\%$	= 494,747
Premium already paid	= 794,860
Refund due to reinsured	= 300,113

During the third year a further \$200,000 of claims are paid by the reinsurers and there are no outstanding losses at the end of the year.

The incurred loss position is now  $\$46,125 + \$75,000 + \$200,000 = \$321,125$ .

At this point a third and final premium adjustment statement is prepared:

Pure burning cost rate = $321,125/41,856,750 \times 100/1$	= 0.767%
Loaded rate = $0.767 \times 100/75$	= 1.022%
Reinsurance premium = $41,856,750 \times 1.022\%$	= 427,776
Premium already paid	= 494,747
Refund due to reinsured	= 66,971

 In terms of cash flow the reinsured has gained nothing from the cover. In fact any claims recoveries he has made from his reinsurers are completely illusory as he has paid his reinsurers \$100 premium for every \$75 of claims recoveries. What is worse, because at the end of the first year the outstanding losses were relatively high, a very large adjustment premium has been paid, giving reinsurers the benefit of a positive cash flow in anticipation of claims that did not materialise.

A reinsurance contract only benefits the reinsured when the claims exceed the contract premium. The reinsurance contract often produces a profit for the reinsurers or an expense for the reinsured. This is essential to provide reinsurers with a fund that can be used to pay losses in ‘bad’ years, as well as to provide reinsurers with an incentive to be in the business.

If a reinsurance contract is designed so that claims are likely to arise under it on a regular basis, it stands to reason that reinsurers will want to build these anticipated claims into their rating calculations.

The burning cost method is a way of achieving this, but it has its drawbacks in terms of an unattractive cash flow from the reinsured’s point of view.

If the reinsured only benefits from the excess of loss cover when the claims exceed the premiums, it seems strange to have a situation where the contract premium is a variable figure that increases with each claim. In fact, the contract only begins to benefit the reinsured after enough claims have occurred to push the burning cost above the maximum contract rate.

Reinsurers often have the benefit of historical claims figures and other information to enable them to estimate the likely amount of claims to the contract. They will use this information to pitch the maximum rate at such a level that they will only lose money in a very unusual year.

Therefore, the question we should ask ourselves is, why have the contract at all?

There are some circumstances in which a working cover may be a fairly sensible option. For example, a new insurance company is usually capable of taking only a small retention. In an excess of loss contract this means the maximum amount that the reinsured can pay in respect of each claim before calling upon his reinsurers. This amount is generally known as the reinsured’s ‘priority’ or ‘deductible’.

Because the company is new it has not built up any reserves from retained profits and so it must initially set its priority at a low level. The reinsurers know from similar business that there are likely to be regular losses exceeding this priority, but have no real way of knowing the size of the reinsured’s portfolio (eg the number of insured

motor vehicles) and, therefore, the likely number of claims. In these circumstances, reinsurers will feel safer with a burning cost rating formula.

The reinsured may also feel happy to accept such a contract because the minimum rate is likely to be quite low, which is important in terms of cash flow in the early years, where reinsurance costs are likely to represent a large proportion of the company's outgoings.

Nevertheless, as soon as a reasonably reliable pattern of loss experience is established, the reinsured should try to move to a fixed rate by eliminating the 'normal' losses from the reinsurance contract.

This may be done by increasing the priority to a level above the normal maximum loss amount. However, this solution may be unsatisfactory because the reinsured could suffer a large number of smaller losses in a single year. For example, unusually bad weather conditions could lead to a large number of road accidents. If the reinsurance priority is set at a high level, none of these claims might affect the contract but the large numbers of claims could cause a severe strain upon the company's resources in the absence of any reinsurance recoveries.

An alternative method of eliminating the pointless cash swapping exercise would be to say, "For this layer of reinsurance protection, I am reasonably sure that I would claim an average of \$750,000 per year from my reinsurers. I will, therefore, choose to pay the first \$750,000 of reinsurance claims under this layer myself". In this way, reinsurers could concentrate upon charging a pure risk premium that is calculated to enable them to build up a reserve against a bad year (ie when claims to the layer go above \$750,000). As there are no anticipated 'normal' claims for the reinsurers to worry about, the reinsurers do not need to charge a floating rate.

This additional retention is known as an 'inner aggregate deductible'. Appendix 7 contains a sample burning cost spreadsheet model in which an inner aggregate deductible is compared to a similar contract rated on a burning cost basis.

# **Chapter 8**

## **Excess of Loss Rating**

Rating of excess of loss contracts is a mixture of statistical theory, experience and intuition, tempered by the effects of market forces. Burning cost rating is the easiest method to understand, because it simply involves determining the average annual incurred losses to the layer, loading it by an expense factor and applying the resultant 'premium' to the GNPI to produce a rate.

There are some important factors to take into account, such as the effects of inflation upon the claims amounts, as well as the amount of the 'usual' claims in relation to the size of the layer. For instance, if the claims to a contract, in excess of \$200,000 are usually no more than \$800,000 then that should be the contract limit. If no claims have ever exceeded \$1,000,000 then, in theory, a burning cost calculation for a layer of \$800,000 excess of \$200,000 would produce the same rate as a layer of \$1,800,000 excess of \$200,000. Clearly, the cover is being rated based upon the \$800,000 limit, excess of \$200,000. The next \$1,000,000 of cover should be separately rated.

### **8.1 Exposure Rating**

An excess of loss cover on a single facultative risk may be rated as a percentage of the original policy premium using first loss rating scales. If you are unfamiliar with this method of rating, please refer to Section 2.1.2.

It stands to reason that, if we were protecting a group of risks on an excess of loss basis, we could apply the first loss scale to every protected risk to arrive at a reasonable premium for an excess of loss cover. However, there are certain problems to overcome, such as:

#### **8.1.1 Reinstatements**

Excess of loss contracts, particularly property covers, are subject to limited reinstatement of the contract limit following a loss. Usually, reinstatements are subject to the payment of an additional premium.

If we were protecting 100 individual risks by way of facultative reinsurance, each risk could result in a total loss to the reinsurers

and there would be no reinstatement premium to be paid because any risk, once totally destroyed, would not expose the reinsurers any further.

Therefore, if we group these 100 risks together and protect them by a single excess of loss cover, with limited, paid reinstatements, we are considerably restricting the extent of reinsurers' potential liability. This should result in a premium discount, compared with the price for protecting the same 100 risks individually.

### **8.1.2 Differing Values**

It is highly unlikely that the 100 risks will all have the same insured value. In fact, in a typical 'profile' of risks, there may be many whose values are below the proposed deductible of the excess of loss cover.

Let us assume that the reinsured retains a maximum of \$10,000,000 per risk, and wishes to arrange an excess of loss programme in layers of \$4,000,000 excess of \$1,000,000 and \$5,000,000 excess of \$5,000,000 each loss, each risk.

- Risks with a sum insured of less than \$1,000,000 would not expose the programme at all
- risks with a sum insured of \$2,000,000 would expose only the first layer. They would effectively be protected for \$1,000,000 excess of \$1,000,000, or 50% excess of 50% of their insured value
- risks with a sum insured of \$8,000,000 would expose the first layer totally. The first layer coverage of \$4,000,000 excess of \$1,000,000 represents 50% excess of 12.5% of original insured values. The second layer would be exposed for \$3,000,000 excess of \$5,000,000 or 37.5% excess of 62.5% of original insured values.

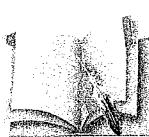
While there is no 100% scientifically correct way of working out excess of loss costs, the following method can be used as a rough guide to the sort of prices you might be expected to pay for a property, per-risk excess of loss programme.

### **The Risk Profile**

This should be prepared for the protected portion of the account. In other words, if the reinsured is protecting his net retention, the risk

profile should be in respect of net retention only. The profile should be prepared in 'bands' of retained sum insured and should show the numbers of risks, the aggregate of retained sums insured and the aggregate of retained premiums (gross) for all risks within each band.

Note that this profile is more detailed than the sort of profiles required for structuring a proportional treaty programme. In a proportional programme we are concerned with the cession of risks which, as we have seen, is usually done on a 'top location and pro-rata' basis. We can, therefore, place each policy in the band corresponding to the sum insured of the highest valued risk in the policy schedule.



**When we are looking at a per-risk excess of loss programme, we are concerned with how each individual risk exposes the cover. If the profile were prepared with all of the premium for each policy being shown in the band corresponding to the value of the biggest risk, the profile would give a pessimistic picture of the true level of reinsurers' exposure.**

In our risk profile we are going to assume that all of the risks in any given band have a sum insured exactly at the midpoint of the band. In other words, if the first band is from \$0 to \$1,000,000 we shall assume that all of the risks within that band are valued at \$500,000.

### First Loss Scale

There are many first loss scales in existence, all prepared by different insurance and reinsurance companies from their own statistical observations. Some companies prepare different scales for different types of business, such as commercial and industrial risks. We shall use the abbreviated scale given in Section 2.1.2.

Let us assume that we are rating a programme in layers of \$4,000,000 excess of \$1,000,000 and \$5,000,000 excess of \$5,000,000. Risks in the band of values from \$5,000,000 to \$6,000,000 are taken to have an average value of \$5,500,000. The \$1,000,000 priority will, therefore, represent  $\frac{1}{5.5}$  or the first 18% of the average value. The first layer will be exposed to the next \$4,000,000 of risk. The priority plus the limit equals \$5,000,000 which is  $\frac{5}{5.5}$  or the first 91% of the risk. If we round these figures to the nearest 10% for simplicity's sake, we can say that the cover plus priority of the first layer represents 90%

of the insured values in this band of the risk profile. The priority on its own represents the first 20% of the values. By referring to the first loss scale, we can see that the first 90% of the risk is worth 95% of the original premium. Therefore, we know that the premium for the cover plus the priority should be 95% of the original premiums in that band of the profile. Also, we can see from the scale that the first 20% of the risk is worth 66% of the original premium. From this, we can deduce that 70% excess of 20% of the sum insured should be worth 29% of the original premium.

We can perform this calculation for every band of the risk profile and for each of the layers. We can then total the reinsurance premiums for each band of the profile to arrive at a premium for the layer in question. However, as we have already seen, this premium is, in effect, nothing more than a total of facultative excess of loss premiums. If the per-risk excess of loss cover provided unlimited, free reinstatements, this would probably be a fair premium to pay. However, in practice, such contracts have limited reinstatements, which may sometimes be free but are more usually subject to the payment of an additional premium. Therefore, we need to find a way to discount this ‘unlimited premium’ to take into account the restriction upon the amount of cover provided.

### **Poisson Tables/Formula**



**Fortunately, statisticians have provided us with a useful tool for determining what the price of a cover should be if reinstatements are limited and are subject to the payment of an additional premium.**

Poisson Tables are statistical calculations that say, for example, that if the probability of an event occurring an unlimited number of times is 80%, the probability of it happening a first time is 57% and the probability of it happening a second time is 19%.

Some spreadsheet programmes, such as Microsoft Excel, have a built-in Poisson function. Unfortunately, other programmes do not and so we need to derive the figures in two stages.

Appendix 8 shows how to derive a Poisson formula in some, but not all, spreadsheets.

## 8.2 Constructing a Property Risk Excess Rating Model

In an ideal situation, we would like to see a risk profile with the aggregate sums insured and the numbers of risks in each band of values, as well as the premiums applicable to each band. This would enable an underwriter to make a judgement regarding the level of original rates being charged so that, if this appears too low, he can adjust his quote accordingly.

Appendix 8 contains instructions for building a model of the premiums.



**This is a complex spreadsheet and, if you are not familiar with spreadsheets, could be quite a challenge!**

## 8.3 Catastrophe Rating

Another statistical tool used in excess of loss rating is a type of frequency distribution known as ‘Pareto’. This is the most common way of rating catastrophe excess of loss contracts to ensure consistency in rating across an entire catastrophe programme. If an underwriter has calculated the rate for a particular layer of cover, other layers of the same programme can be rated by ‘reading off’ the rate from a suitable Pareto Curve. ‘Suitable’ refers to the fact that Pareto Curves, like all statistical curves, can be derived from a mathematical formula, which has a variable factor. The size of the variable depends upon the observed loss patterns for the type of business or territory we are studying.

In the absence of ‘suitable’ Pareto Curves, we can make a very rough guess at the rating for a catastrophe programme, using the same first loss scale used in the risk excess of loss rating model.



**Essentially, all we are going to do is establish the correct premium or loss cost for the catastrophe PML, and then apply our first loss scale to this figure. However, there are several stages we need to go through first.**

## **Stage 1 - Index the claims history**

Hopefully, there will be some sort of claims history for the perils concerned. We should be very careful when looking at the previous claims history as certain key factors may have changed. For example, the reinsured may have stopped granting earthquake cover as an automatic extension and may now only grant cover by special endorsement, at an additional premium. Another good example concerns policy deductibles. In the Caribbean area, windstorm deductibles were hardly ever applied before the occurrence of Hurricane Hugo, but since then, deductibles of 2% of insured value have been commonplace. If such deductibles had been applied before Hugo the insured losses would have been considerably less.

Indexation of the claims should take into account not only inflation, but also the growth in the protected account. This can be achieved by indexing based upon the growth in the reinsured's premium income (the GNPI). For example, if the GNPI in 1990 was \$20,000,000 when a catastrophe loss of \$5,000,000 was suffered, and in 1995 the GNPI had grown to \$30,000,000, the \$5,000,000 loss could be indexed to \$7,500,000. Assuming that rates have not changed, the increase in the GNPI should reflect inflation plus the growth in the reinsured's business.

## **Stage 2 - Establish the catastrophe PML**

This may be the same as the total amount of cover, including deductible, that the Reinsured is purchasing. It is for this reason that underwriters often stipulate in their quotations 'warranted no higher layer carried'. In other words, the underwriter, in preparing his quotation, has taken the amount of cover purchased as the reinsured's assessment of the catastrophe PML. Should the reinsured subsequently decide to purchase more cover, it can be deduced that his estimation of the PML has increased. Consequently, the reinsurer can be thought to be more heavily exposed and may wish to charge a higher premium.

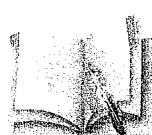


**As an alternative to establishing the PML in this way, we can turn to market information, such as that supplied by the CRESTA organisation, which may suggest the PML for various catastrophe perils as a percentage of the protected aggregate sum insured.**

There are a number of catastrophe modelling software packages that attempt to estimate the likely claims amounts that a given portfolio would suffer under certain circumstances. These models usually require a large input of portfolio data, such as the postal code, construction type, policy deductibles and sums insured relating to every policy in force. The manufacturers of these packages are constantly recalibrating their models with every new earthquake, flood or windstorm event.

An insurer will rely on the output from such models to indicate how much catastrophe cover they should be purchasing. Likewise, the reinsurer will use this information to assist him in the quotation process and to check the price of any programme he is offered against the prices of similar programmes in the same territory.

The limits and deductibles of catastrophe programmes can be thought of in terms of their 'return period' to compare the prices against those of similar programmes or to determine whether a given quotation represents good value for money compared to another with a different structure. For example, a programme might have a deductible of GBP 10,000,000 and that figure may represent a flood loss that (according to a particular catastrophe model) has a return period of 15 years. The first layer might have a limit of GBP 40,000,000 excess of GBP 10,000,000. Therefore, a loss that exhausts the limit of the first layer would be GBP 50,000,000 'from ground up' and that might represent a flood loss with a return period of 60 years. The remaining layers of the programme could take the protection up to a return period of 200 years.



These days almost every reinsurance broker and underwriter employs dedicated teams of catastrophe modellers, whose job is to check, "clean" and input the data into the models and if necessary make assumptions about that data where the quality of it is not ideal. The output from those models is expressed in terms of the expected monetary loss from events of particular return periods. Nobody should ever imagine that these models are predictive. If you are purchasing catastrophe reinsurance against a 1:200 year event, there is no guarantee that you will not suffer a 1:500 year event tomorrow. The models are useful as benchmarking tools to guide insurers as to the levels of cover it is prudent to purchase and for reinsurers to compare prices.

### **Stage 3 - Calculate the 'as if' loss experience**

Having indexed the losses, we can then take the largest loss as a guide and work out the 'as if' losses for a fictitious layer of 90% excess of 10% of the largest loss. Therefore, if our largest indexed loss is \$40,000,000, we have a fictitious layer of \$36,000,000 excess of \$4,000,000. We can then apply these limits to all of the indexed loss amounts, to arrive at the as if loss position for that layer. These as if losses should then be totalled and divided by the number of years in the observation.

### **Stage 4 - Calculate the fictitious limit and deductible as percentages of the PML**

For example, if the catastrophe PML is \$80,000,000 a layer of \$36,000,000 excess of \$4,000,000 represents 45% excess of 5% of the PML.

### **Stage 5 - Find a loss factor from the Pareto Curve or first loss scale**

In our 45% excess of 5% example, we are saying that we are covering up to 50% of the PML. From our first loss scale, the rate for the first 50% of cover is 83%. The rate for the first 5% is 42.5% and so it is logical to assume that the rate for 45% excess of 5% should be 83-42.5% or 40.5%. If we now take the average as if loss for the 45% excess of 5% layer and divide it by this loss factor, we will arrive at the 100% loss cost. In other words, if the average as if loss is \$10,000,000 the 100% loss cost (for the full \$80,000,000 of cover) would be  $10,000,000/.405 = 24,691,358$ .

### **Stage 6 - Establish the proposed limit and priority as percentages of the PML**

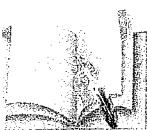
A layer with a limit of \$20,000,000 excess of \$20,000,000 protecting a PML of \$80,000,000 has a limit of 25% excess of 25% of the PML.

### **Stage 7 - Apply Pareto Curve or first loss scale to the 100% loss cost**

The layer 25% excess of 25% takes us up to the first 50% of the PML. We have established the loss cost (or pure risk premium) as \$24,691,358 in our example. The first 50% of cover, according to our first loss scale, accounts for 83% of the premium. The first 25% (the deductible or priority) accounts for 71.2% of the premium. We can,

therefore, deduce that the premium for 25% excess of 25% would require 11.8% of the pure risk premium, equivalent to \$2,913,580. This figure may then be expressed as a percentage of the GNPI for contract rating purposes.

Please note that this is a very rough guide. Every reinsurer will have a different method of calculating rates. Many will load the rate by a ‘fluctuation loading’ to protect themselves against early occurrences of catastrophes or losses of such a magnitude that they defy previous predictions.



**Care needs to be taken when dealing with an account protecting multiple perils and multiple catastrophe zones. Nevertheless, it should prove useful as a rough guide to estimating rates, provided it is used judiciously and modified for local circumstances.**

## 8.4 Constructing a Catastrophe Rating Model

Appendix 9 uses the same spreadsheet file that contains the risk excess of loss rating model to create a catastrophe rating model.



## Chapter 9

# Market Evolution

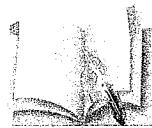
Reinsurance is a constantly evolving business and, as our world grows more complex, the potential for greater financial losses is growing at an alarming rate.

Although it is the job of underwriters to foresee the likeliest causes of major losses, it is true to say that the insurance and reinsurance community is often caught unawares by the scale and nature of losses, and is sometimes forced to change direction in the light of expensive experience.

For example, prior to Hurricane Tracy in Darwin in 1974 it was possible to purchase per-risk excess of loss covers with unlimited reinstatements. This meant that, although reinsurers placed strict limits upon the amount of loss they could sustain on a single risk, they carried potentially unlimited liability with regard to the number of individual losses the contract could sustain in a single event. It is unlikely that such covers could be placed any more. Reinsurers impose limited reinstatements on property risk excess of loss contracts, and may also impose separate limits per event.

Another example was the oil rig explosion on Piper Alpha in the North Sea in 1988. Prior to this event it was normal for employers to purchase unlimited employers' liability coverage. Now, due to the non-availability of reinsurance protection, insurers in the UK only offer liability coverage of up to £10 million per employer, although there is a small market for excess of loss insurance above that figure.

In the area of property covers, reinsurers have recently become acutely aware of some unusual weather patterns. The UK and other parts of Northern Europe were affected by a hurricane in 1987 and severe storms in 1990. The 1980s and 1990s witnessed severe weather-related losses all over the globe, while earthquake losses now have a greater potential for economic loss due to increasing industrialisation and insurance awareness. This has led reinsurers to attempt to limit their liability under proportional property treaties by imposing per-event limitations.



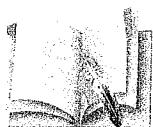
**In some ways, this is a similar measure to the post-Darwin event limitations under per-risk excess of loss covers. However, there is one important difference. An excess of loss cover is rated, to some degree, independently of original premiums because the reinsurer is not participating in the losses to the same degree as the reinsured. In proportional reinsurance the reinsurers are receiving the same share of the original premium on each risk that they should pay in respect of any losses. Therefore, it seems cynical of the reinsurers to try to limit their share of a catastrophe loss to less than their true share, based upon the proportion of the original premiums that they have received.**

Reinsurers may argue that they cannot accept unlimited liability but, in reality, this is precisely what the ceding company is doing all of the time. The liability of the reinsurers for their share of a treaty is no more unlimited than the potential liability of the ceding company on the totality of its retained shares. The ceding company must assess its retained liabilities and try to estimate the amount of catastrophe protection required to protect it against the worst foreseeable loss situation. The reinsurer must attempt to do the same while accepting treaties and facultative risks from all over the world. The calculations are, therefore, more complex and some reinsurers have been finding that the profits earned from reinsurance are sometimes not sufficient to allow them to purchase adequate levels of catastrophe protection. This explains their attempts to reduce potential liabilities while maintaining premium volume.

An alternative to catastrophe event limits in proportional property treaties is to limit the amount of business ceded to the treaty in respect of a single catastrophe zone. For example, the total amount of sum insured ceded in respect of risks located in Mexico City must not exceed a stipulated figure at any time during the life of the contract. Provided the reinsured is careful not to exceed these limits, the reinsurers will always be providing catastrophe coverage up to the full extent of their share of each individual risk. If, at the time of a catastrophe loss, it is found that the limits for the affected zone have been exceeded, the reinsurers will be entitled to apply the condition of average to the whole loss occurrence, and reduce their payment accordingly.

Another example of a market changing in response to circumstances was the concern raised over the failure of computer systems with the approach of the year 2000. This resulted in the introduction of clauses commonly referred to as 'Y2K' exclusions, and sometimes referred to as 'EDRC' (electronic date recognition clauses). Even after the passing of the millennium, such clauses remain in reinsurance contracts.

2011 was the worst catastrophe year on record, with two major earthquakes in Christchurch, New Zealand (following hard on the heels of another major quake there in 2010), the devastating Japanese earthquake and tsunami, and the massive floods in Australia. While these led to some much needed price increases, the amount of capital currently deployed within the world's reinsurance market means that the impact of these disasters has not been as dramatic as the catastrophes of past decades.



**These are just a few examples of circumstances in which the reinsurance market has adapted its practices in the light of experience. There are of course many more, including asbestos and the mounting costs of litigation in the United States.**



# Chapter 10

## Miscellaneous

### 10.1 Retrocession Treaties

A retrocession is a reinsurance of a reinsurance. Reinsurance is a way of giving an insurer additional capacity to allow it to accept greater levels of risk. In effect, reinsurance is a means of providing additional capital to an insurer.



**Although not many people will see it this way, an insurer could have a net reinsurance cost of 5% of its premiums year after year and still be getting a good deal. How? If the cost of raising the additional capital necessary to underwrite its account exceeds 5% of the insurer's premiums, a 5% net reinsurance cost will save the insurer money.**

Reinsurers are able to provide their capital cheaply because they can achieve an increased spread of risk by accepting reinsurance from around the world. However, even reinsurers need protection, particularly if their own capital is limited and they specialise in narrow geographical regions or classes of business. Such reinsurers frequently arrange retrocession protections. Proportional retrocession treaties are becoming quite rare these days, mainly because reinsurers are unwilling to pay extra commission to their competitors for business they would rather accept on a direct basis.

There is still a market for excess of loss retrocession protections. These may protect facultative, proportional treaty or excess of loss business, or all three types together. These protections differ from standard excess of loss reinsurances where the calculation of the exposure is concerned.

As an example, consider a retrocession protection of a motor excess of loss treaty portfolio. Assume that the cover is for \$20,000,000 excess of \$5,000,000 each and every loss. The protected reinsurer (the 'retrocedent') is accepting shares of motor excess of loss covers from a number of territories. In many cases the original programmes are placed in layers and, in certain cases, the retrocedent does not

accept or receive the same share in all layers of the programme. Take the following example:

<b>Layer</b>	<b>Limit</b>	<b>Priority</b>	<b>Retrocedent's share</b>
1	\$5,000,000	\$10,000,000	10%
2	\$15,000,000	\$15,000,000	5%
3	Unlimited	\$30,000,000	25%

A single loss of \$15,000,000 would represent a total loss to the first layer of \$5,000,000, but as the retrocedent only has 10% of the layer his loss would only be \$500,000. If the original loss were \$30,000,000, the retrocedent would incur an additional amount of 5% of \$15,000,000 or \$750,000, bringing the retrocedent's ultimate net loss to \$1,250,000. Therefore, to expose the retrocession protection there would need to be an additional \$3,750,000 of loss from the third layer. As the retrocedent has a 25% share of this layer, there would need to be a loss of \$15,000,000 to the layer. A single claim under this particular programme would have to exceed \$45,000,000 before it could begin to trigger the retrocession protection. This is the 'entry point' for the retrocession. The 'exit point' would be reached after the loss to the retrocedent increases by a further \$20,000,000, but as the retrocedent only has 25% of the third layer this means that the original loss would need to be an additional \$80,000,000 into the layer. Therefore, the original loss that would be required to result in a total loss to the retrocession would be \$125,000,000.



**It is important to perform a similar analysis of the entire portfolio when seeking quotations for such protections to demonstrate just how far removed the protections are from everyday loss situations.**

## 10.2 Reinstatement Premium Protections

Most excess of loss treaty protections have limited reinstatements that must be paid for in the event of a loss. Reinstatements are usually automatic, so even if the contract suffers a total loss on its last day, the reinsured must still pay the reinstatement premium. Sometimes, the reinsured may feel that, in the event of a catastrophe,

the amount of loss falling to his priority, plus the reinstatement premiums, would still represent a severe threat to his balance sheet. In such cases, it may be wise to consider purchasing a 'reinstatement premium protection'. This cover guarantees to pay any reinstatement premiums incurred under one or more named excess of loss treaties.

In theory, the rating of such covers is easy. If the contract has a rate on line of 10%, it is thought to have a 1-in-10 chance of a loss (ignoring loading factors, etc). The reinstatement protection would also have a rate of 10% (but now of course the rate applies to the possible reinstatement premium). In practice, things are never quite so easy because the cover might protect a number of different layers, or even different programmes, and there may be multiple reinstatements on some of the layers.



**As we have seen in our rating exercises, the rate for a cover will vary according to the number and cost of reinstatements. The probability of successive reinstatements being utilised falls away rapidly for many excess of loss covers, and all of this needs to be factored into the rating. Of course, market forces will always have a great impact upon the actual price of the cover, regardless of the technical arguments.**

### 10.3 Additional Reinstatement Covers

Sometimes a broker or insurer will receive a number of quotations from several markets. It may happen that the most attractive quotation has the drawback of insufficient reinstatements. If the underwriter is unwilling to allow more reinstatements, but the insurer is keen to accept the quotation, he may try to arrange a backup reinstatement protection that will operate in the event that the reinstatements on the original layer become exhausted. There are reinsurers who specialise in offering these types of protections. For the reinsurer, the possibility of suffering a loss is often remote. The reinsured must pay a premium for the cover at the start of the year, unlike the standard reinstatements of the main cover, where the premium only becomes payable on settlement of a claim. However, the combination of the best quotation with inadequate reinstatements, plus the additional cost of a backup reinstatement cover, may represent the best deal for the reinsured.

## **10.4 Alternative Reinsurance**



**Given that reinsurance is a method of providing capital, you would think that there would be alternative methods of achieving the same objective. You would be right. A study of the various methods of financing risk would be beyond the scope of this book and would probably become out of date very quickly.**

'Time and distance covers' were once sold to Lloyd's syndicates as a way of smoothing the requirements for cash to meet likely payment dates. The syndicate would give an estimate of its outstanding liabilities and a likely timescale for the cash requirement. Specialist reinsurers would discount this amount (for the time-value of money) and take a 'premium' in advance, in return for an agreement to release pre-agreed cash payments to the syndicate on certain dates. Such covers are now disallowed under Lloyd's regulations, but there is nothing to stop an insurance company from purchasing one if it wants to.

Other types of contract involve the use of 'derivatives'. A derivative can be almost anything. For example, somebody could trade financial instruments based on the FTSE 100 Index. If the index moves up, the instrument gains value and can be sold for a profit. The application in the insurance industry comes from finding a derivative product that approximates the risk to the insurer. For example, if the insurer has a heavy exposure to flood in a particular State, it could purchase derivatives that are geared to an index of insurance industry flood losses in that same State. If the insurer suffers losses it is likely that the whole industry will have suffered to a similar degree. The insurer could then sell his flood bonds at a profit as an alternative to conventional reinsurance recoveries.

## **10.5 Thinking Things Through**

Throughout this book I have tried to stress the need for testing reinsurance programmes as far as possible against existing or theoretical data. Snap decisions are often made about reinsurance, based on prejudice or misunderstood ideas. Beware of following blindly what others say. Reinsurance is such a mathematical business that the effect of changes to a reinsurance programme can be

estimated quite well, particularly when dealing with proportional treaties.

Here are a couple of examples of ideas I have come across. They are not bad ideas, but they should always be thought through and tested against the true facts whenever possible.

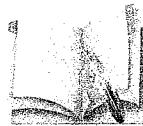
***"Graded retentions make better treaties"***

The practice of grading retentions according to risk type and construction standards is common throughout the insurance community.

Insurers use it to control the amount of risk that they retain and, in doing so, to balance their portfolio. For example, if a company decides that it can retain £1,000,000 per risk in its fire department, the figure will only be regarded as a maximum, to be utilised on a risk of low hazard, with the highest standards of construction and housekeeping. Where the standard of the risk falls below these ideals there will be a scaling down of the retention. For example, on a sawmill built of wood, the retention could be scaled down to £100,000, representing 10% of the maximum.

This has a direct bearing upon the amount that the company may cede to its surplus treaties, where the treaty limits are expressed as multiples of the retention. The treaty reinsurers often insist that the company should adhere to a table of limits in the belief that it gives them a better spread of risk, with more of the better risks and less of the poorer risks.

However, this is a very simplistic view. Consider two risks, each with a sum insured of £1,000,000. Risk A is of the highest standard, where the company can take a full retention of £1,000,000. The surplus treaty reinsurers will receive nothing on this risk. Risk B is considered to be poor, and the company is only permitted to retain £100,000. A 10 line surplus treaty will be capable of taking the remaining £900,000 (representing 9 lines). Therefore, the reinsurers will be taking 90% of the poor risk without the benefit of premiums from the high quality risks.



**Of course, this anomaly only occurs with risks whose values are relatively small, but it is always worth looking closely at the risk profile to see whether this is likely to be a problem. Ideally, the risk profile may be broken down by risk category or hazard grade, so that some rough calculations may be made concerning the effect of the table of limits upon the premium distribution between the ceding company and the various treaties.**

In an ideal world, such tables of limits would be unnecessary because the poorer risks should carry a much higher premium rate than the better risks. For example, warehouses are considered by many underwriters to be poor risks. This is because they are often unattended at night and may contain flammable substances. If the rate for a good risk should be 1 per mille, then perhaps a general warehouse should attract a rate of 5 per mille. If the insurance company accepts a large number of warehouse risks at the correct rate, its theoretical exposure should be no worse than if it were to accept a large number of 'best class' risks. This is because in both cases the rates should have been calculated based upon the experience of similar types of risk.



**The key to successful underwriting is to have large numbers of risks written at the correct premium rates, because of course the concept of risk is a statistical problem and statistics only have real validity when the sample size is high.**

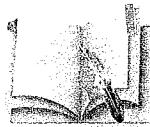
In many parts of the world the insurance market is very small by Western standards because there is very little demand for insurance. In such countries it is difficult to build a balanced portfolio because there are simply not enough insured risks. In property insurance the majority of insured risks may be commercial and industrial, with virtually no residential property being covered. This can often mean that the entire national premium volume may not be sufficient to cover a single serious loss affecting a major risk. Without reinsurance, such markets would effectively be gambling. The reinsurance market can take a global view of its exposures, meaning that if a reinsurer loses money in a particular country one year, it should have sufficient profits from other markets to maintain stability.

***“Quota share bad, surplus good”***

Some insurance companies refuse even to consider a quota share treaty, believing that it would mean ceding away its most profitable business. In many cases this may be true, but the figures often prove otherwise. Never forget that a quota share treaty meets its proportionate share of claims under every single policy. Ceding commission for such treaties is high and the ceding company may also benefit from premium reserves, loss reserves and profit commission. Even if the treaty is still giving the reinsurers a regular profit after all these factors are taken into account, there is still the question of catastrophe protection. A quota share treaty is likely to cover a very large accumulation of sums insured. Without the treaty, the ceding company would need to purchase much more catastrophe excess of loss protection.

## **10.6 The Market Reform Contract (MRC)**

For many years, insurance brokers in the London market used a document called a ‘slip’ to place insurance and reinsurance deals, both in Lloyd’s and elsewhere. A slip was designed to be a summary document, based upon which the professionals in the market (namely the brokers and underwriters) could quickly understand the nature of the deal. The slip was never intended to be the final contract document. That was left to the insurance policy or the reinsurance treaty wording. Although the main content of the slip, plus a summary of the insurers or reinsurers and their shares, were combined into a document known as the ‘cover note’ and sent to the client, that document was only intended to be a summary of the cover the broker had arranged. The client needed a far more detailed document to fully understand the cover that had been arranged on his behalf. Unfortunately, the policies or treaty wordings often took far too long to complete. Often, the broker would prepare the document and submit it to the various parties for signature, only to find that the client or one or more of the reinsurers did not agree with how the wording had been drafted. This led to severe delays (sometimes the wording was not finalised until after the contract had expired) and an increasing awareness that the shorthand language of the broker was not universally understood.

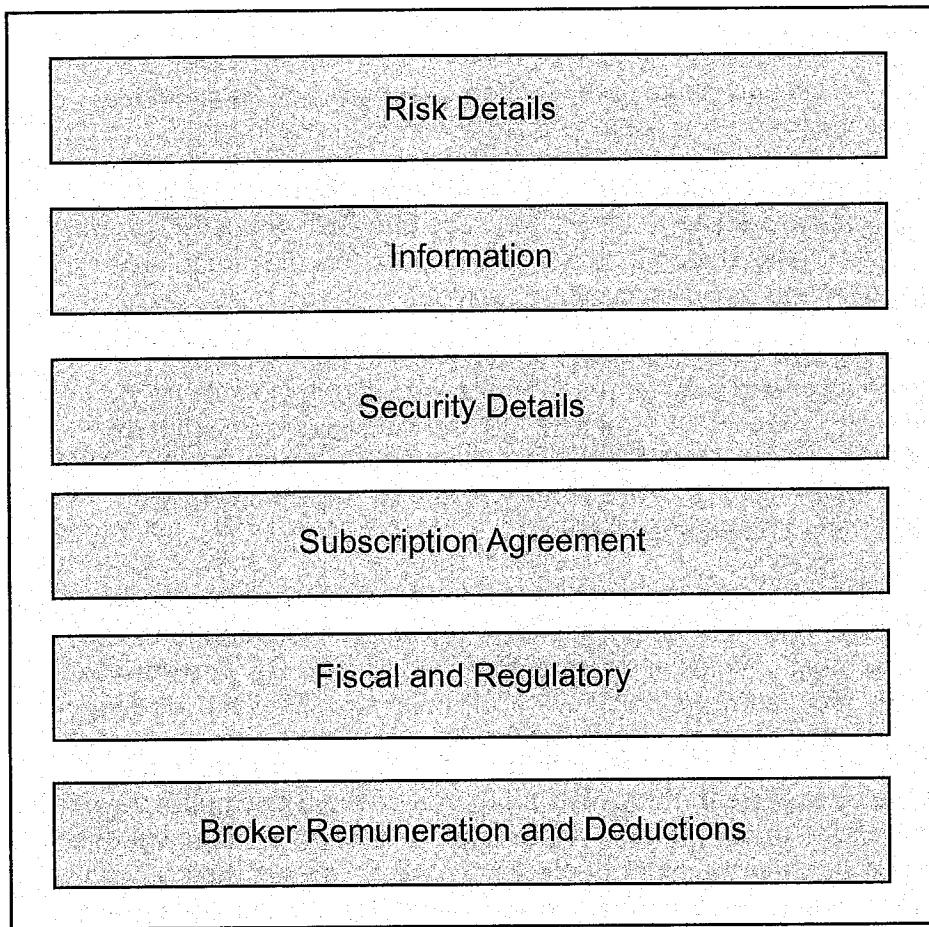


**When I joined the reinsurance industry in 1973, Lloyd's had already started trying to standardise the slip headings. However, that did not solve the problems that were giving rise to ever-lengthening delays in finalising contract wordings and the consequent risks of disputed cover.**

In 2001, the London market embarked upon a process of reform, known as 'LMP 2001'. This marked the beginning of the market's drive toward greater clarity at the outset of the insurance or reinsurance placement. A new slip format was introduced and both the brokers and the underwriters signed up to these protocols, at the same time agreeing target dates for achieving almost total compliance with the new standard. Immediately, vague terminology such as 'tba L/U only' was banned from the slip. Warranties had to be specified in full, stating precisely what would happen in the event of a breach. The slip was divided into two sections; the 'Risk Details' and the 'Subscription Agreement'. The latter section was a set of agreements between the broker and the subscribing underwriters as to how they would deal with certain issues, such as who could agree certain types of changes (the lead reinsurer, the lead plus others who designated themselves as 'other agreement parties' or the entire market on the placement).

Following the introduction of the LMP slip, changes came thick and fast. The market reform slip was introduced and this subsequently became the Market Reform Contract, a document that is intended to be the one and only contract document between the purchaser and the vendor. As no further documentation is expected to be issued (unless by subsequent endorsement) it follows that the MRC must contain a full policy wording or a full set of clauses. The MRC contains six sections.

## Market Reform Contract Structure



The ‘Risk Details’ and ‘Information’ sections largely follow the format that was laid down by Lloyd’s in the early 1970s, except that abbreviations are banned and the content is more precise than before.

The ‘Security Details’ section contains the names of all of the participating insurers/reinsurers, their shares, underwriting references and certain notices concerning the terms of their participation (such as how their lines may be ‘signed down’ in the event that the contract is over-subscribed).

The ‘Subscription Agreement’ establishes the rules to be followed for processing and administration of post-placement amendments and transactions.

The ‘Fiscal and Regulatory’ section describes any fiscal and regulatory issues specific to the insurers involved in the risk.

The ‘Broker Remuneration and Deductions’ section contains information relating to brokerage, fees and deductions from premium. None of these deductions are paid to or by the client and are between the broker and market only.

The guidance notes and specimen MRC, to be found in Appendix 10, are taken from the Market Reform Contract (Open Market), Version 1.2, August 2008 and are reproduced with the kind permission of the Market Reform Group. For the latest information on the MRC please visit the Group’s website at <http://www.marketreform.co.uk>

The ‘Risk Details’, ‘Information’ and ‘Security Details’ sections together form part one of the MRC, while the ‘Subscription Agreement’, ‘Fiscal and Regulatory’ and ‘Broker Remuneration and Deduction’ sections collectively form part two, known as the contract administration and advisory section.

Before the advent of the MRC, the broker would draw up a cover note to send to the client. This would take the form of a letter, with the client’s address, an introductory paragraph, relevant text copied from the slip, some closing text (usually referring to the broker’s terms of business) and a sign-off.

Under the new system, the broker prepares a letter spelling out his terms of business, and drawing the client’s attention to warranties etc, to which he attaches a copy of part one of the MRC, copies of the underwriters’ acceptances and a typed list of the insurers/reinsurers and their signed lines. The document is collectively referred to as the evidence of cover document or EOC.



**Strictly speaking, only the MRC, as signed by the underwriters, the pages bearing the underwriters' signatures and the broker's summary of the market form the documentation that is approved by the underwriters. The EOC letter the broker produces is a separate document between the broker and his client, and has no legal force in the eyes of underwriters.**

The broker may, if he so wishes, attach both parts one and two of the MRC to his EOC document in the interests of transparency. In the past, brokers were reluctant to tell clients how much the market was paying them by way of brokerage. Now the client has the right to know, but does not need to be told if he does not ask the question. However, some brokers have taken the decision to reveal their earnings at the outset.



**While this book is not specifically about the practices of the UK market, the MRC has marked an important development in the history of the market, since it aims to ensure contract certainty from the start of the placement. The client, having received the evidence of cover document from the broker, will not expect to receive any further documentation.**



# Appendix 1

## Answers to Practical Exercise 1

### Distribution of Premiums and Claims over a Proportional Programme

1. From the table of retentions, we can see that the company can take 100% of its maximum retention for this risk. The distribution is therefore as follows:

	<b>Sum Insured</b>	<b>%</b>	<b>Premium</b>	<b>Claim</b>
Retention	300,000	1.2	600	420
Quota Share	700,000	2.8	1,400	980
1 <sup>st</sup> Surplus	10,000,000	40	20,000	14,000
2 <sup>nd</sup> Surplus	10,000,000	40	20,000	14,000
Fac. Oblig.	4,000,000	16	8,000	5,600
Facultative	0	0	0	0

2. From the table of retentions, we can see that the company can take 50% of its maximum retention for this risk. The distribution is therefore as follows:

	<b>Sum Insured</b>	<b>%</b>	<b>Premium</b>	<b>Claim</b>
Retention	150,000	0.75	435	292.5
Quota Share	350,000	1.75	1,015	682.5
1 <sup>st</sup> Surplus	5,000,000	25	14,500	9,750
2 <sup>nd</sup> Surplus	5,000,000	25	14,500	9,750
Fac. Oblig.	9,500,000	47.5	27,550	18,525
Facultative	0	0	0	0

3. From the table of retentions, we can see that the company can take 60% of its maximum retention for this risk. The distribution is therefore as follows:

	<b>Sum Insured</b>	<b>%</b>	<b>Premium</b>	<b>Claim</b>
Retention	180,000	1.2	456	4,200
Quota Share	420,000	2.8	1,064	9,800
1 <sup>st</sup> Surplus	6,000,000	40	15,200	140,000
2 <sup>nd</sup> Surplus	6,000,000	40	15,200	140,000
Fac. Oblig.	2,400,000	16	6,080	56,000
Facultative	0	0	0	0

4. From the table of retentions, we can see that the company can take 70% of its maximum retention for this risk. The distribution is therefore as follows:

	<b>Sum Insured</b>	<b>%</b>	<b>Premium</b>	<b>Claim</b>
Retention	210,000	1.17	420	175.5
Quota Share	490,000	2.72	980	408.0
1 <sup>st</sup> Surplus	7,000,000	38.89	14,000	5,833.5
2 <sup>nd</sup> Surplus	7,000,000	38.89	14,000	5,833.5
Fac. Oblig.	3,300,000	18.33	6,600	2,749.5
Facultative	0	0	0	0

It should be noted that the company is not obliged to cede to the facultative obligatory cover, and could choose to place some of the risk facultatively, after using its quota share and surplus treaties.

## Appendix 2

### Answers to Practical Exercise 2

#### Profit Commission Calculations

##### **Exercise 2 (a)**

###### Income

Premiums ceded	428,394
Premium Portfolio Entry at 40%	139,171
Outstanding Loss Entry at 90%	86,206
Total of Income	653,771

###### Outgo

Commission at 35%	149,938
Paid Losses	104,346
Premium Portfolio Withdrawal at 40%	171,358
Outstanding Loss Withdrawal at 90%	59,388
Reinsurers' Expenses at 5%	21,420

Total of Outgo	506,450
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Income	653,771
Profit for year	147,321
Deficit c/f from previous year	66,933
Final profit	80,388
Profit Commission at 25%	20,097

##### **Exercise 2 (b)**

###### Year 1

###### Income

Premiums ceded	348,540
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**Outgo**

Commission at 35%	121,989
Paid Losses	124,678
Premium Portfolio Withdrawal at 40%	139,416
Outstanding Loss Withdrawal at 90%	92,839
Reinsurers' Expenses at 7.5%	26,141
<b>Total of Outgo</b>	<b>505,063</b>
Income	348,540
Deficit	156,523

**Year 2**

**Income**

Premiums ceded	347,928
Premium Portfolio Entry at 40%	139,416
Outstanding Loss Entry at 90%	92,839
<b>Total of Income</b>	<b>580,183</b>

**Outgo**

Commission at 35%	121,775
Paid Losses	134,759
Premium Portfolio Withdrawal at 40%	139,171
Outstanding Loss Withdrawal at 90%	86,206

Reinsurers' Expenses at 7.5%	26,095
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<b>Total of Outgo</b>	<b>508,006</b>
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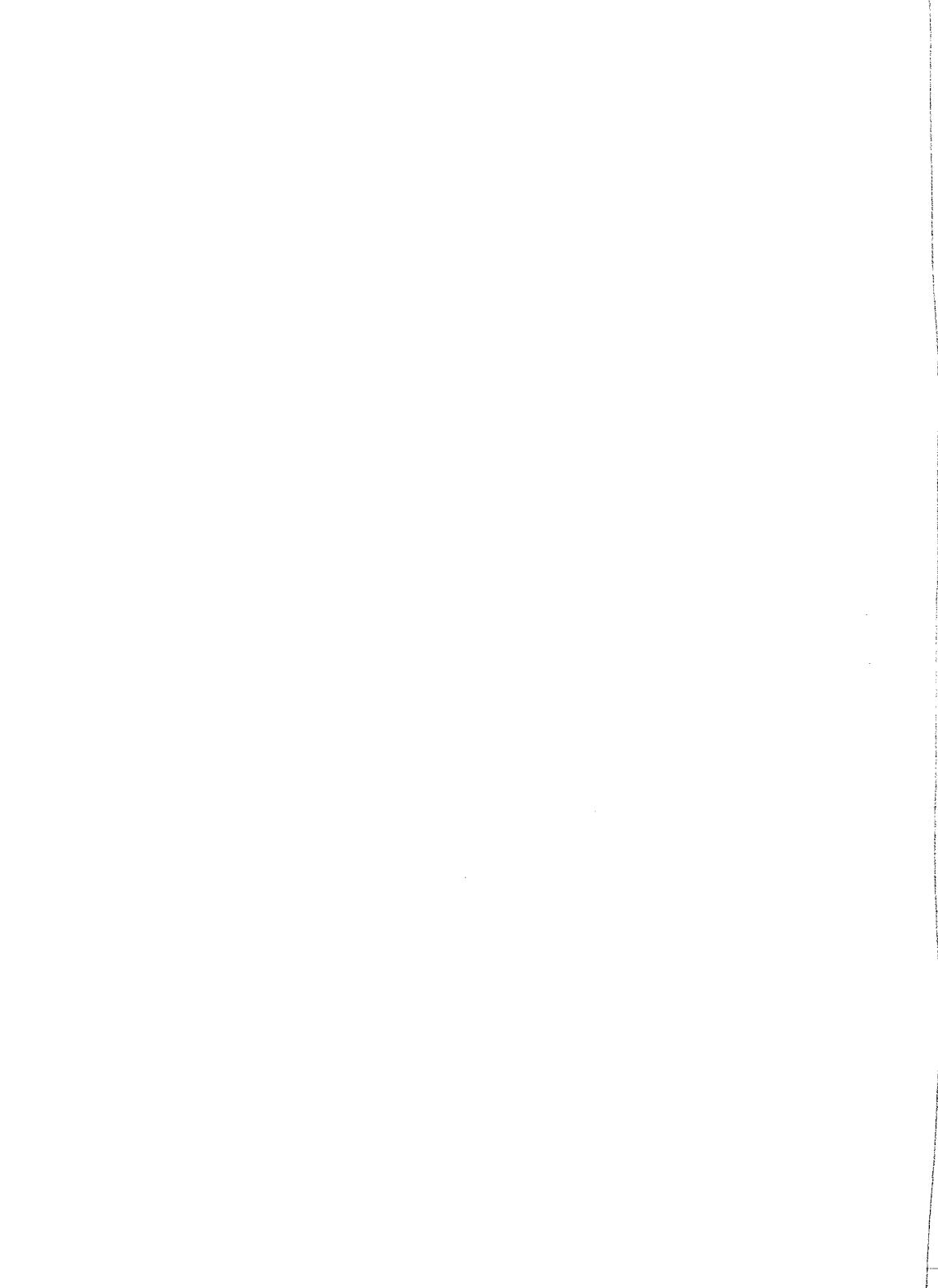
Income	580,183
Profit for year	72,177
Deficit c/f from previous year	156,523
Final deficit	84,346

**Year 3**

**Income**

Premiums ceded	428,394
----------------	---------

Premium Portfolio Entry at 40%	139,171
Outstanding Loss Entry at 90%	86,206
Total of Income	653,771
Outgo	
Commission at 35%	149,938
Paid Losses	104,346
Premium Portfolio Withdrawal at 40%	171,358
Outstanding Loss Withdrawal at 90%	59,388
Reinsurers' Expenses at 7.5%	32,130
Total of Outgo	517,160
Income	653,771
Profit for year	136,611
Deficit c/f from previous year	84,346
Final Profit	52,265
Profit Commission at 25%	13,066



# Appendix 3

## Answers to Practical Exercise 3

### Excess of Loss Claims Allocations

The period for a freeze loss is 168 hours, or 7 days.

The first task is to deduct the recoveries from the per-risk covers, which operate in excess of \$250,000 each loss, each risk. There were two losses of \$400,000 each and one of \$300,000.

All of these losses occurred in 2012. There will be the following recoveries under the 2012 per-risk programme:

Loss	\$400,000	400,000	300,000
Priority	\$250,000	250,000	250,000
Recovery	\$150,000	150,000	50,000

The reinstatement premiums will be calculated as follows:

$$\text{Loss # 1: } 150,000/750,000 \times 120,000 \times 100\% = 24,000$$

$$\text{Loss # 2: } 150,000/750,000 \times 120,000 \times 100\% = 24,000$$

$$\text{Loss # 3: } 50,000/750,000 \times 120,000 \times 100\% = 8,000$$

The above three losses are now shown for net amounts of \$250,000 each.

We then need to total the losses for each day from the start of the event, and list the days in order. We must be careful to list all of the days, even if there were no recorded losses on some of them. This will enable us to take running totals of the losses from various periods of 7 consecutive days.

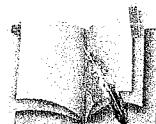


A spreadsheet programme, such as Microsoft Excel, is an ideal tool for performing these calculations.

Bear in mind that the object is not necessarily to maximise the ultimate net loss, but to maximise the company's benefit from the

programme. In this case, it was only necessary to compare two possible solutions, as follows:

Date	Net Loss	7 Days	7 Days
28/12/11	20,000		XXXXXX
29/12/11	50,000		
30/12/11	70,000		
31/12/11	100,000		
01/01/12	0		
02/01/12	460,000		
03/01/12	80,000	780,000	
04/01/12	450,000		1,210,000
05/01/12	0		XXXXXX
06/01/12	50,000		
07/01/12	100,000		
08/01/12	70,000		
09/01/12	70,000		
10/01/12	250,000	990,000	
11/01/12	120,000		
12/01/12	50,000	170,000	710,000
UNL		1,940,000	1,920,000
No. of occurrences		3	2



The reason why the Net Loss figures differ between the exercise and the answers is that, for example, on 02/01/12 there were two losses, one for 400,000 and the other for 210,000. The 400,000 loss is reduced to 250,000 by the recovery from the Risk XL programme, so the Ultimate Net Loss for that day was 460,000.

If we choose to start the first 7 day period on day # 1, the ultimate net loss is \$1,940,000 but the company would have to bear three priorities under the catastrophe programme.

On the other hand, if we ignore day # 1 as well as day # 9, we arrive at a slightly smaller ultimate net loss, but the company now only has to pay two priorities under the catastrophe programme.

Therefore, the catastrophe programme would operate as follows:

First event:

Date of Loss: 29/12/11

Ultimate Net Loss	1,210,000		
1 <sup>st</sup> Layer recovery	650,000	Reinstatement Premium	40,000
2 <sup>nd</sup> Layer recovery	210,000	Reinstatement Premium	10,500

Second event:

Date of Loss: 06/01/12

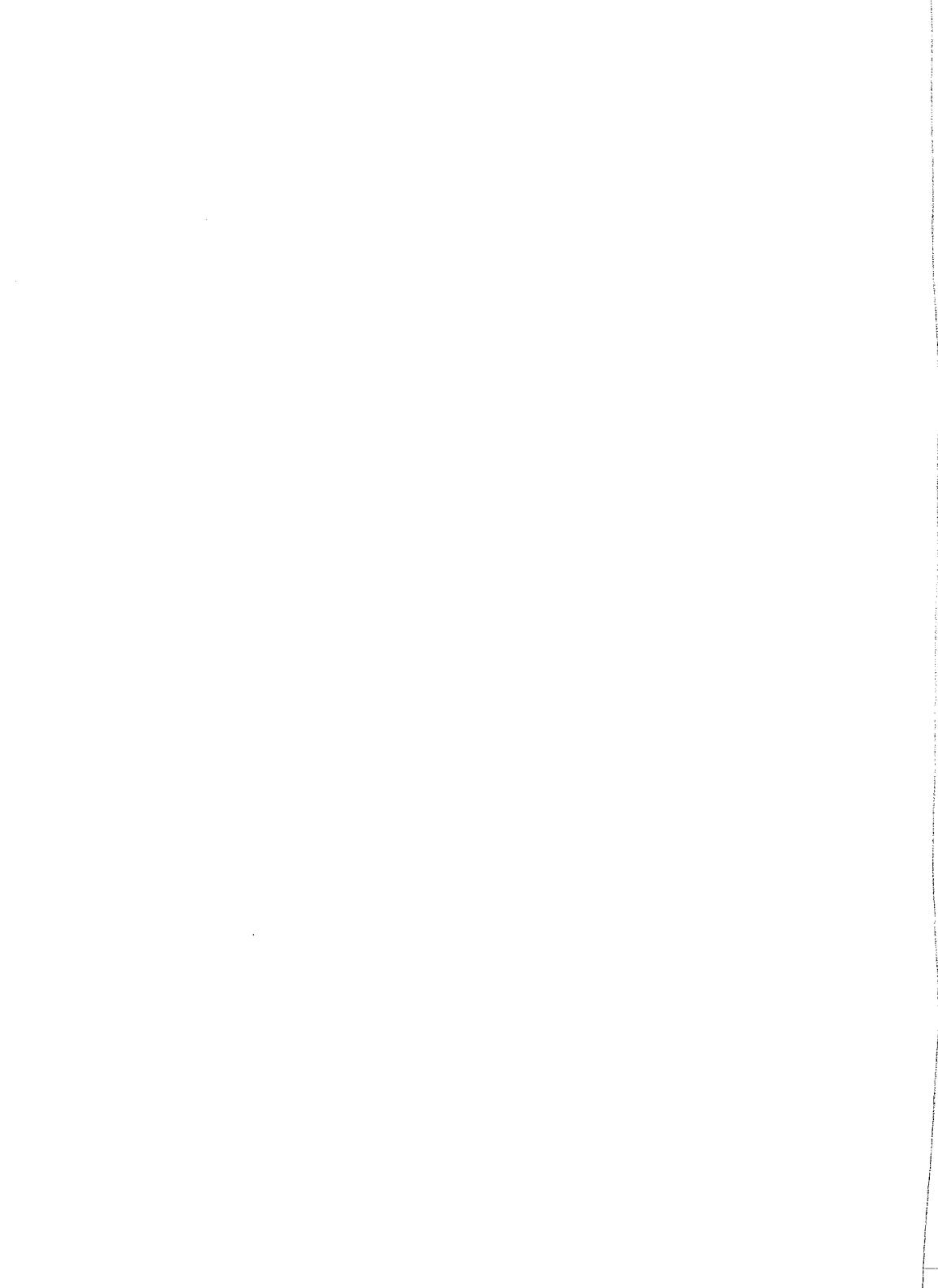
Ultimate Net Loss	710,000		
1 <sup>st</sup> Layer recovery	360,000	Reinstatement Premium	24,396



# Appendix 4

## Specimen Scale of Property First Loss Rates

<b>1<sup>st</sup> loss amount</b>	<b>Scale Rate</b>	<b>1<sup>st</sup> loss amount</b>	<b>Scale Rate</b>	<b>1<sup>st</sup> loss amount</b>	<b>Scale Rate</b>
1	22.4	34	77.3	68	86.9
2	28.1	35	77.6	69	87.1
3	31.0	36	78.0	70	87.3
4	36.7	37	78.4	71	87.6
5	42.5	38	78.8	72	87.8
6	44.8	39	79.2	73	88.0
7	47.1	40	79.5	74	88.3
8	49.2	41	79.9	75	88.5
9	51.7	42	80.2	76	89.0
10	54.0	43	80.4	77	89.4
11	55.1	44	80.8	78	89.9
12	56.3	45	81.1	79	90.6
13	57.4	46	81.5	80	90.8
14	58.6	47	81.8	81	91.3
15	59.7	48	82.1	82	91.7
16	60.9	49	82.4	83	92.2
17	62.0	50	82.7	84	92.6
18	63.2	51	83.0	85	93.1
19	64.3	52	83.2	86	93.6
20	65.5	53	83.4	87	94.0
21	66.6	54	83.7	88	94.5
22	67.8	55	83.9	89	94.9
23	68.9	56	84.1	90	95.4
24	70.1	57	84.4	91	95.9
25	71.2	58	84.6	92	96.3
26	72.0	59	84.8	93	96.8
27	72.7	60	85.0	94	97.2
28	73.4	61	85.3	95	97.7
29	74.1	62	85.5	96	98.2
30	74.8	63	85.7	97	98.6
31	75.6	64	86.0	98	99.1
32	76.3	65	86.2	99	99.5
33	77.0	66	86.4	100	100
		67	86.7		



## **Appendix 5**

# **Specimen Treaty Wordings**

The examples below follow a format that can easily be incorporated into the MRC format for placements into the London Market requiring an MRC to be used. It is simply necessary to remove all reference to a schedule and replace with “as specified under xxxxx in the Risk Details”.

### **Non-Marine Surplus Treaty**

#### REINSURANCE AGREEMENT

made and entered into between

(hereinafter referred to as the “Reinsured”)

of the one part

and

#### INSURANCE AND REINSURANCE COMPANIES

Whose signatures appear on the Signing Schedules attached hereto  
each for their one part and not one for the other

(hereinafter referred to as the “Reinsurers”)

of the other part.

WHEREBY IT IS AGREED AS FOLLOWS:

## ARTICLE 1

### REINSURING CLAUSE

The Reinsured agrees to cede and the Reinsurers agree to accept by way of reinsurance a share of business, whether direct or as coinsurance or by way of facultative reinsurance, underwritten by the Reinsured, as set out in the Schedule attached to and forming part of this Agreement on risks situated in {COUNTRY} including their interests abroad except for Personal Accident, Cash in Transit, Personal Effects and Travel Insurance which may be situated Worldwide.

## ARTICLE 2

### EXCLUSIONS

It is agreed that this Agreement shall not cover:

- (i) Any liability assumed by Reinsured on loss or damage directly or indirectly occasioned by, happening through or in consequence of war, invasion, acts of foreign enemies, hostilities or warlike operations (whether war be declared or not), civil war, mutiny, civil commotion assuming the proportions of or amounting to a popular rising, military rising, insurrection, rebellion, revolution, military or usurped power, martial law, confiscation or nationalisation or requisition or destruction of or damage to property by or under the order of any Government or public or local authority.

However, it is agreed that, the foregoing paragraph shall not apply to those classes of business which are written in accordance with the War and Civil War Exclusion Agreement nor to business outside the scope of those Agreements unless such losses of business are not covered by this Agreement.

This Agreement does not cover any liability assumed by the Reinsured on loss or damage directly or indirectly occasioned by, happening through or in consequence of any act of any person or persons acting on behalf of or in connection with any organisation the objects of which are to include the overthrowing

or influencing of any de jure or de facto government by terrorism or by any violent means.

- (ii) Nuclear Energy Risks as per Nuclear Energy Risks Exclusion Clause (1994) NMA 1975(a) (as attached).
- (iii) Obligatory Reinsurances.
- (iv) Pro Rata Treaty Reinsurances and all forms of Excess of Loss Reinsurance other than Coinsurance and Facultative Reinsurances from the local market.
- (v) Permanent Accident and Sickness.
- (vi) Bonds (other than Bankers Blanket), Financial Guarantees and Penalties.
- (vii) Marine and Offshore Technology Risks.
- (viii) Third Party Liability in respect of Contractor's Plant and Equipment whilst being driven under its own power on the public highway.
- (ix) Deterioration of Stock in respect of the Machinery Breakdown Section.
- (x) Advanced Loss of Profits
- (xi) Decennale Covers.
- (xii) Satellite Risks.

### ARTICLE 3

#### CONDITIONS

The liability of the Reinsurers for amounts ceded to them under this Agreement commences simultaneously with that of the Reinsured and shall be identical in every way with that of the Reinsured. An insurance effected by the Reinsured wherein the Reinsured is named as the Insured either alone or jointly with another party, shall be deemed to be an insurance coming within the scope of this Agreement notwithstanding that no legal liability may arise in respect thereof by reason of the fact that the Reinsured is named as

the Insured or one of the Insureds. All cessions hereunder shall be subject to the same clauses and conditions as the original policies, except in so far as they are contrary to the terms of this Agreement. The Reinsurers agree to follow the settlements of the Reinsured and pay as may be paid by them, it being understood that the intention of this Agreement is that the Reinsurers shall follow the fortunes of the Reinsured in all respects.

The Reinsured shall have absolute discretion in fixing the amount of its retention on any one risk and in determining what constitutes one risk.

Nothing contained in this Agreement to the contrary will prevent the Reinsured from revising the amount of its retention provided it has no knowledge of the risk having been affected by a loss.

This Agreement shall be subject where applicable to the provisions of the Special Conditions, if any, embodied in the attached Schedule.

Long term risks shall be ceded for period of 12 months at a time other than CAR/EAR risks.

The Reinsured may submit to the Reinsurers for their consideration details of any risk falling outside the scope of this Agreement, and if accepted by the Reinsurers, such risks shall be considered as coming within the scope of this Agreement.

#### ARTICLE 4

##### REGISTERS OF RISKS

The Reinsured shall keep at their office registers in which shall be entered all risks ceded hereunder. An entry in such a register constitutes a cession hereunder and shall be binding upon Reinsurers.

In the event of the Reinsured sustaining a loss before an entry has been made in such a register, the Reinsured shall nevertheless be entitled to claim from the Reinsurers in accordance with the provisions of this Agreement.

## ARTICLE 5

### BORDERAUX AND INSPECTION OF RECORDS

The Reinsured shall not be required to furnish bordereaux to the Reinsurers.

It is however understood and agreed that the Reinsurers hereon or their duly authorised representatives, shall have the right to inspect the books of the Reinsured on all matters pertaining to this Agreement at all reasonable times and upon reasonable notice being given. It is agreed that the Reinsurers' rights of inspection shall continue as long as either party has a claim against the other arising out of this Agreement.

## ARTICLE 6

### PREMIUM

The premium payable to the Reinsurers under this Agreement shall be a proportionate share of the original Gross Premiums received by the Reinsured in respect of the business covered hereunder, less only the Reinsurers' proportion of any cancellations or returns of premium.

The Reinsurers shall pay to the Reinsured upon the Gross Premiums defined above commission at the rates specified in the Schedule. The Reinsurers shall also bear their proportion of any taxes for which the Reinsured may be liable to the extent specified in the Schedule.

## ARTICLE 7

### PROFIT COMMISSION

The Reinsurers shall allow the Reinsured a Profit Commission on the Combined Results of Fire, Miscellaneous Accident, Renewable Engineering, Contractors All Risks and Erection All Risks Sections at the rate specified in the Schedule on the actual net profit to the Reinsurers for each underwriting year. Such Profit Commission shall be calculated on the dates specified in the Schedule for each underwriting year, in accordance with the following formula:

## Income

- 1) Losses outstanding from the previous profit commission statement for the underwriting year under consideration.
- 2) Gross Premiums for the current year as defined in Article 6.
- 3) Premium Reserve brought forward from the previous profit commission statement for the underwriting year under consideration.

## Outgo

- 1) Commission, taxes and other charges if applicable as defined in Article 6 calculated on item 2) of Income.
- 2) Losses and Loss Expenses paid during the current year on business falling within the underwriting year under consideration.
- 3) Losses outstanding at the end of the current year for the underwriting year under consideration.
- 4) Premium Reserve at the end of the current year in accordance with Article 10 calculated on item 2) of Income.
- 5) Reinsurers' management expenses calculated at the percentage specified in the Schedule.
- 6) Deficit, if any, carried forward from the previous Underwriting Year(s) of Account.

The excess of INCOME over OUTGO, calculated as above, represents the net profit upon which the Profit Commission shall be paid.

Should the transactions of any underwriting year result in a loss for any profit sharing period, the total amount of such loss shall appear as a further item of Outgo in the profit sharing account of the ensuing year or years for a maximum of five further underwriting years unless such loss is extinguished by subsequent profit before this five year period has elapsed.

In the event of this Agreement being terminated in accordance with the Special Cancellation provisions of Article 12 no further Profit Commission shall be payable until all liability hereunder has been determined.

It shall be noted that the first Profit Commission Statement shall be calculated at {EXPIRY DATE} and adjusted annually thereafter until all liabilities under the underwriting year under consideration have been extinguished and deficits under any of the preceding {NUMBER OF YEARS OF DEFICIT CARRY FORWARD} underwriting years profit commission calculations have been finally established.

## ARTICLE 8

### CLAIMS SETTLEMENTS

All settlements, compromises and expenses including ex gratia payments, in consequence of losses on business ceded under this Agreement will be under the sole management and discretion of the Reinsured which will be at liberty to commence, defend, compromise, settle or withdraw from legal actions, suits and prosecutions and adopt any other means in connection with the adjustment of claims as it may think fit.

The Reinsurer will be liable for its share of the claim and all costs and expenses incurred in connection therewith excluding office expenses and salaries of officials of the Reinsured but the Reinsurer will be entitled to its share of any salvages or recoveries relating to such claim.

All losses shall be dealt with in the accounts provided for in Article 9, but in the event of the Reinsured sustaining a loss to this Agreement in excess of the amount specified in the Schedule under the heading "Cash Loss" the Reinsurers shall pay their proportion of the claim immediately in cash, if so requested by the Reinsured. It is understood, however, that any balances due in favour of the Reinsurers at the time of such a request for a cash settlement may first be deducted from the amount of the claim.

The Reinsurers shall have the right to inspect at the offices of the Reinsured all original documents relating to any loss, without however refusing or delaying payment on their part of such loss and/or expenses.

## ARTICLE 9

### ACCOUNTS

The accounts hereunder shall be compiled at the dates specified in the Schedule, and shall be rendered by the Reinsured to the Reinsurers as soon as possible, but not later than eight weeks after the close of each accounting period.

The accounts shall be rendered in the main currency specified in the Schedule and other currencies shall be converted at the same rate of exchange at which they were remitted to or paid by the Reinsured or failing this, at the rates of exchange ruling on the last day of the month in which the relative account was compiled.

The accounts shall be rendered on an underwriting year basis, broken down between Fire, Accident and CAR/Machinery Breakdown branches.

The accounts shall be confirmed by the Reinsurers within thirty days after their receipt and the balance on either side shall be paid within thirty days after receipt of such confirmation.

It is agreed that either party may deduct from any balance due to the other party any sum owing by the latter to the former whether under this Agreement or any other Treaty Agreement between the parties hereto.

## ARTICLE 10

### PREMIUM RESERVE AND INTEREST

The Reinsured shall be entitled to retain as Premium Reserve a percentage, as specified by local legislation and mentioned in the Schedule, of the premium credited to the Reinsurer in each quarterly account. This reserve shall be retained by the Reinsured for twelve months and released to the Reinsurer in the account for the corresponding quarter of the following year.

The Reinsured shall pay to the Reinsurers on such Reserve Fund interest at the rate specified in the Schedule, such interest to accrue from the date on which the respective amounts are credited to the Reserve Fund.

In the event of termination of this Agreement the Reinsured shall be entitled to retain only sufficient balances to cover the amount of outstanding liability and such balances to be released commensurately with the reduction of this liability until all the obligations of the Reinsurer under this Agreement have been fully discharged.

## ARTICLE 11

### LOSS RESERVE AND INTEREST

The Reinsured shall also be entitled to retain as at {ANNIVERSARY DATE} of each year an amount equivalent to a percentage, as specified by local legislation, of the outstanding losses in the Reinsured's books as at that date. The outstanding loss reserve so retained shall be released to the Reinsurers as at {ANNIVERSARY DATE} of the succeeding year or years until all outstanding losses for the underwriting year in question have been settled. As at {ANNIVERSARY DATE} of each year the Reinsured shall pay to the Reinsurers interest at the rate specified in the Schedule of the outstanding loss reserve retained during the preceding 12 months.

## ARTICLE 12

### ATTACHMENT AND TERMINATION

This Agreement takes effect on and from the date specified in the schedule and applies to all policies written or renewed after that date.

The Agreement is concluded for an indefinite period but may be terminated at the date specified in the Schedule by either party giving 3 months prior notice in writing by registered letter or telex or cable to the other party. During the term of notice to terminate, and until its expiry, the Reinsured shall renew existing cessions and take new risks in the same manner and in all respects as if no such notice had been given.

#### Special Cancellation

Either party shall have the right to terminate this Agreement immediately by giving the other party notice:

- (a) If the performance of the whole or any part of this Agreement be prohibited or rendered impossible de jure or de facto

in particular and without prejudice to the generality of the preceding words in consequence of any law or regulation which is or shall be in force in any country or territory or if any law or regulation shall prevent directly or indirectly the remittance of any or all or any part of the balance of payments due to or from either party.

- (b) If the other party has become insolvent or unable to pay its debts or has lost the whole or any part of its paid up capital.
- (c) If the other party should reduce its paid-up capital.
- (d) If the other party should go into liquidation whether voluntary or compulsory or pass a resolution preliminary to liquidation or suffer the appointment of a Receiver.
- (e) If there is any material change in ownership or control of the other party.
- (f) If the other party should amalgamate with or be acquired or controlled by any other Company or corporation.
- (g) If the other party shall have failed to meet its obligations under this agreement or to comply with any of the terms and conditions of this Agreement.
- (h) If the other party should commit any breach of the conditions of this Agreement.
- (i) If the country or territory in which the other party resides or has its head office or is incorporated shall be involved in armed hostilities with any other country whether war be declared or not or is partly or wholly occupied by another power, always providing that the circumstances detailed herein have the effect of rendering the performance of the whole or any part of this Agreement impossible.

All notices of termination in accordance with any of the provisions of this paragraph shall be by the quickest means available and shall be deemed to be served upon despatch or where communications between the parties are interrupted upon attempted despatch.

All notices of termination served in accordance with any of the provisions of this Article shall be addressed to the party concerned at

its head office or at any other address previously designated by that party.

Should the Agreement be cancelled in accordance with any of the foregoing Special Cancellation provisions, the Reinsured shall at the date of termination cancel the whole of the Reinsurance ceded hereunder and the Reinsured shall be entitled to be repaid by the Reinsurers a proportionate part from the date of such cancellation of all premiums paid or credited to the Reinsurers on the cancelled reinsurances in respect of any period extending beyond the date of cancellation. Furthermore the Reinsurer shall remain liable for losses occurring up to and including the date of such termination. Thereafter the liability of the Reinsurer shall cease outright other than as far as outstanding claims are concerned.

#### ARTICLE 13

#### ERRORS AND OMISSIONS

Any error and/or inadvertent omission in connection with the application of this Agreement shall not prejudice the rights of either party but shall be corrected immediately upon discovery so that the parties hereto shall be placed in the same position as if the error and/or inadvertent omission had not occurred.

#### ARTICLE 14

#### CONFIDENTIALITY

The Reinsurers shall regard the transactions under this Agreement as strictly confidential and shall not at any time, during its currency or thereafter, make any use, either directly or indirectly, of the information afforded of the business and connections of the Reinsured which shall or may in any way operate to the prejudice or detriment of the latter.

#### ARTICLE 15

#### ALTERATIONS AND AMENDMENTS

Any alterations which may from time to time become necessary to this Agreement may be made by addendum or by correspondence, the documents embodying such alterations as may be mutually

agreed upon being attached to this Agreement and forming an integral part thereof.

## ARTICLE 16

### ARBITRATION

All disputes arising out of this Agreement or concerning its interpretations or validity whether arising before or after its termination shall be referred to a Court of Arbitration which shall consist of two Arbitrators who shall be active or retired officials of Companies or underwriters carrying on a similar type of insurance or reinsurance business to that covered hereunder; one to be appointed by each party, and an Umpire who shall be appointed by the Arbitrators immediately after they themselves shall have been appointed and in the event of the Arbitrators being unable to reach agreement on the reference the Umpire shall forthwith enter on the reference in lieu of the Arbitrators.

If either of the appointed Arbitrators for any reason whatsoever fails to act the party by whom he was appointed shall by writing appoint an Arbitrator in his place and should either party fail to appoint an arbitrator within one month after being requested by the other party in writing to do so, or in the event of the Arbitrators failing to agree as to the appointment of the Umpire within one month after their own appointment such Arbitrator or Umpire as the case may be shall be appointed in writing by the Secretary General for the time being of the Court of Arbitration of the International Chamber of Commerce at the written request of either party.

The Arbitrators or Umpire as the case may be shall determine any reference in accordance with current reinsurance market practice pertaining during the period of this Agreement and in making their award shall at the same time decide as to the payment of the cost of the arbitration. The Court of Arbitration shall take place in {CITY} the law applicable to both the aforesaid Agreement and this arbitration agreement shall be the law of {COUNTRY}.

This arbitration agreement shall be construed as a separate and independent contract between the parties hereto and arbitration hereunder shall be a condition precedent to the commencement of any action at law.

## ARTICLE 17

### INTERMEDIARY CLAUSE

{NAME OF BROKER} are hereby recognised as the intermediary negotiating this Agreement for all business hereunder. All communications and documents relating hereto shall be transmitted to the Reinsured and the Reinsurers through {NAME AND ADDRESS OF BROKER}.

---

### SCHEDULE

Attaching to and forming part of Reinsurance Agreement No. {POLICY NUMBER} for account of.

- |   |   |
|---|---|
| 1) CLASS OF BUSINESS<br>AND TREATY LIMITS:<br>(Article 1) | Applicable to each class  |
| 2) TREATY CESSION:<br>(Article 1)                         | Up to {NUMBER} Gross Lines of up to a maximum of {AMOUNT} per line any one risk or as specified in the attached schedule.<br><br>{NOTE: A schedule should be attached showing the retentions and treaty limits for each class of business accepted}             |
| 3) COMMISSION:<br>(Article 6)                             | %   |
| 4) TAXES:<br>(Article 6)                                  | As per local legislation.   |
| 5) PROFIT COMMISSION:<br>(Article 7)                      | % on the combined results of Fire, Miscellaneous Accident, Renewable Engineering, Contractors All risks and Erection All Risks Section.<br><br>% Reinsurers Expenses<br><br>Deficit to be carried forward for a maximum of {NUMBER} further underwriting years. |

6) CASH LOSS LIMIT: (Article 8)	{AMOUNT} for 100% Reinsurers' share.
7) ACCOUNTS: (Article 9)	To be compiled as at:  {DATES}       ) of each year ) )
8) MAIN CURRENCY: (Article 9)	
9) PREMIUM RESERVE: (Article 10)	% as per local legislation subject to interest at % per annum.
10) LOSS RESERVE: (Article 11)	% or as per local legislation subject to interest at % per annum.
11) COMMENCEMENT DATE: (Article 12)	Risks attaching on or after {DATE}.
12) NOTICE OF CANCELLATION: (Article 12)	3 months notice of cancellation to expire on {ANNIVERSARY DATE}  In the event of cancellation of this Agreement long term policies will continue to run to their individual anniversary dates.

In witness whereof both the Agreement and Schedule are made in duplicate and signed as under by each of the contracting parties signifying their Agreement to both documents.

For and on behalf of the Reinsured

This                    day of                    20

and for REINSURERS named in the individual Signing Schedules attached hereto.

The subscribing Reinsurers' obligations under contracts of reinsurance to which they subscribe are several and not joint and are limited solely to the extent of their individual subscriptions. The subscribing Reinsurers are not responsible for the subscription of any co-subscribing Reinsurer who for any reason does not satisfy all or part of its obligations.

#### RETENTION TABLE FOR FIRE DEPARTMENT BUSINESS

Maximum percentage of the gross lines to be retained per risk category.

##### CONSTRUCTION/OCCUPANCY

	I	II	III
A	100	80	60
B	100	75	50
C	80	60	40
D	60	45	30
E	30	R	R
F	R	R	R

R = REFER TO GENERAL MANAGER

## Notes

### 1. Occupancy classification

- A. Independent non-hazardous, non-manufacturing risks with no storage of stock-in-trade.
- B. Independent non-hazardous commercial and light industrial risks with incidental storage of stock-in-trade/process and with good standard of fire protection.
- C. Non-hazardous retail and wholesale commercial risks with no production or manufacturing process.
- D. Non-hazardous light industrial risks and workshops.
- E. Other non-hazardous risks.
- F. Risks with either hazardous storage or process involved.

### 2. Construction classification

Based on construction of external walls and roof.

- I Reinforced concrete, concrete blocks, bricks, stone and the like.
- II Roof of galvanised corrugated iron sheets, aluminium or asbestos on steel/iron frame and brick/concrete block walls.
- III Wholly constructed of sheets of galvanised/corrugated iron or aluminium sheets on steel or timber frames and other mixed construction not classified above.

Nuclear Energy Risks as per the NUCLEAR ENERGY EXCLUSION CLAUSE (Reinsurance) (1994) - NMA 1975a

{FULL WORDING OF THIS CLAUSE APPEARS ELSEWHERE IN THE APPENDICES}

**Motor and General Liability Excess of Loss**

**REINSURANCE AGREEMENT**

made between

(hereinafter referred to as the "Reinsured")

of the one part

and

CERTAIN REINSURERS named in the individual Signing Schedules attached hereto.

(hereinafter called the "Reinsurers") of the other part.

WHEREBY IT IS AGREED AS FOLLOWS:

## ARTICLE 1

### TERM OF AGREEMENT

This Agreement shall apply to losses occurring during the period commencing on {DATE} and ending on {DATE}.

## ARTICLE 2

### TERRITORIAL SCOPE

This Agreement shall apply to risks written and located in {COUNTRY/IES}, including incidental extensions world-wide.

## ARTICLE 3

### CLASSES OF POLICIES OR PERILS COVERED

This Agreement shall apply to all policies of Insurance and Reinsurance written by the Reinsured, subject to the exclusions contained in Appendix covering the following:

Motor (All Sections including Personal Accident Benefits) including Contractors Plant and Equipment whether in use as tools of trade or otherwise.

General Third Party Liability.

Workmen's Compensation (including off-duty extensions) and Common Law benefits including Employers Liability as per legislation in the location of the risks, or per legislation of the country of the labourer or per legislation of the country of hire.

All Special Acceptances previously agreed to be automatically covered by all Reinsurers subject no material alteration.

## ARTICLE 4

### REINSURING CLAUSE

The Reinsurers hereby agree to indemnify the Reinsured for that part of their Ultimate Net Loss which exceeds the amount stated in the schedule under the heading "EXCESS" in respect of each and every loss with a limit of liability to Reinsurers of the amount stated in the

schedule under the heading “LIMIT” Ultimate Net Loss each and every loss.

The term “each and every loss” where used herein shall be understood to mean all individual accidents or occurrences arising out of and directly occasioned by one event.

## ARTICLE 5

### INDEX CLAUSE

- A. In the event of any loss hereunder the retention of the Reinsured and the limit of liability of the Reinsurers shall be adjusted by reference to an index, as hereinafter defined, applying at {DATE} in the manner hereinafter set out. The index at the above mentioned date shall be called the BASE INDEX.
- B. In respect of any loss settlement(s) made under this Agreement, the Reinsured shall submit a list of payments comprising such loss settlements(s) showing the amount(s) paid and the date(s) of payment. However all payments (including legal costs) to one victim excluding continuing regular payments, shall be aggregated and the index at the date of payment, as defined below, shall be that applying at the time that the final payment for compensatory damages is made. The amount of each such payment, and/or continuing regular payment, shall be adjusted by means of the following formula:

$$\frac{\text{Amount of Payment} \times \text{Base Index}}{\text{Index at date of Payment}} = \text{Adjusted Payment Value}$$

All actual payments and adjusted payment values shall be separately totalled, and the retention of the Reinsured, and the limit of liability of the Reinsurers, shall be multiplied by the fraction:

$$\frac{\text{Total of Actual Payment}}{\text{Total of Adjusted Payment Values}}$$

C. Definitions

a) Index

- i) In respect of an award resulting in continuing regular payments, the index or indices to be applied shall be that to which such an award is linked, and for all other payments the index to be applied shall be that for Wages for the territory in which the claim is made as appearing in the statistics published by the International Monetary Fund.

In the event that this publication does not contain a Wages index for the territory concerned, then the index to be applied shall be that for Consumer Prices published by the International Monetary Fund.

If the publication does not contain any indices for the territory concerned, then an alternative publication shall be mutually agreed by the parties hereto.

- ii) The index at date of payment shall be the latest available, and/or the index at the date of the first continuing regular payment and subsequently as used to adjust.
- b) The date of payment shall be deemed to be as follows:
  - i) Where no award is made by the Courts the actual date upon which settlement is agreed by the Reinsured.
  - ii) The date an award is made by a Court (if no Appeal is made).
  - iii) The date an award is made by the Appeal Court if the case goes to Appeal. However, in event that the Appeal Court reduces the damages awarded by the Lower Court, other than changes in apportionment of liability then Section ii) above shall apply.
  - iv) The date from which continuing regular payments commence, or in the event that such payments are adjusted, the date from which such adjustment takes effect.

Notwithstanding the above, it is agreed that the provisions of this Article shall apply to Third Party Bodily Injury losses only. For all other payments, the Adjusted Payment Value shall be the amount of the actual payment.

## ARTICLE 6

### ULTIMATE NET LOSS

The term "Ultimate Net Loss" shall mean the sum actually paid by the Reinsured in settlement of losses or liability after making deductions for all recoveries, all salvages and all claims upon other reinsurances other than underlying reinsurance, including all adjustment expenses arising from the settlement of claims other than the salaries of employees and the office expenses of the Reinsured. All salvages, recoveries or payments recovered or received subsequent to a loss settlement under this Agreement shall be applied as if recovered or received prior to the aforesaid settlement and all necessary adjustments shall be made by the parties hereto. Provided always that nothing in this clause shall be construed to mean that losses under this Agreement are not recoverable until the Reinsured's Ultimate Net Loss has been ascertained.

## ARTICLE 7

### CONDITIONS

This Agreement shall be deemed to be subject to the same terms, clauses and conditions as the original policies and/or contracts as far as they may be applicable hereto and shall pay as may be paid thereon, but subject nevertheless to the terms and conditions of this Agreement.

This Agreement shall furthermore be subject to the provisions of any Special Conditions embodied in the attached schedule.

## ARTICLE 8

### NET RETAINED LINES

This Agreement shall only protect that portion of any insurance or reinsurance which the Reinsured, acting in accordance with its established practices retains net for its own account. Reinsurers'

liability hereunder shall not be increased due to an error or omission which results in an increase in the Reinsured's normal net retention nor by the Reinsured's failure to reinsurance in accordance with its normal practice, nor by the inability of the Reinsured to collect from any other Reinsurers any amounts which may have become due from them, whether such inability arises from the insolvency of such other Reinsurers or otherwise.

## ARTICLE 9

### PREMIUM

The rate of premium payable by the Reinsured to the Reinsurers and all other conditions regarding the computation and/or payment of premium shall be as specified in the attached schedule.

## ARTICLE 10

### REINSTATEMENT

In the event of any portion of the indemnity given hereunder being exhausted, the amount exhausted shall be automatically reinstated from the time of commencement of any loss occurrence to the expiry of this Agreement without payment of any additional premium.

However, in respect of General Third Party Liability losses the Reinsurers' liability shall never be more than {AMOUNT} in all during the term of this Agreement.

## ARTICLE 11

### EXTENDED EXPIRATION CLAUSE

If this Agreement should expire or be terminated whilst an event which may give rise to a loss hereunder is in progress it is understood and agreed that, subject to the other conditions of this Agreement, the Reinsurers hereon shall be liable as if the entire event had occurred prior to the expiration of this Agreement, provided always that no part of that loss occurrence is claimed against any renewal of this Agreement.

## ARTICLE 12

### ACTS IN FORCE CLAUSE

The provisions of this Agreement are based on the benefits payable and other terms as provided for in legislation relating to the business protected hereunder in {COUNTRIES} at the effective date of inception of this Agreement. Should any alterations to such benefits or other terms be made subsequently materially affecting the basis of this Agreement, the parties hereto agree to take up for immediate discussion a suitable revision in the terms of the Agreement. Failing agreement on a revision this Agreement shall operate from the effective date of the change of law as if the change had not occurred.

## ARTICLE 13

### WARRANTIES

It is warranted:

{LIST THE WARRANTIES WHICH MAY APPLY}

## ARTICLE 14

### TERMINATION

Either party shall have the right to terminate this Agreement immediately by giving the other party notice by telex or telegram which shall be deemed to be served upon despatch or where communications between the parties are interrupted upon attempted despatch:

- i) If the performance of the whole or any part of this Agreement be prohibited or rendered impossible de jure or de facto in particular and without prejudice to the generality of the preceding words in consequence of any law or regulation which is or shall be in force in any country or territory or if any law or regulation shall prevent directly or indirectly the remittance of any or all or any part of the balance of payments due to or from either party.
- ii) If the other party has become insolvent or unable to pay its debts or has lost the whole or any part of its paid up capital.

- iii) If there is any material change in the management or control of the other party.
- iv) If the country or territory in which the other party resides or has its head office or is incorporated shall be involved in armed hostilities with any other country whether war be declared or not or is partly or wholly occupied by another power or be in a state of civil war, provided that the circumstances detailed herein render the performance of the whole or any part of this Agreement impossible.
- v) If the other party shall have failed to comply with any of the terms and conditions of this Agreement.

All notices of termination in accordance with any of the provisions of this paragraph shall be by cable, telex or any other means of instantaneous communication and shall be deemed to be served upon despatch or where communications between the parties are interrupted upon attempted despatch.

In the event of this Agreement being terminated at any date other than its normal expiry date then the premium due to the Reinsurers shall be calculated upon the premium income of the Reinsured up to the date of termination or where applicable pro rata temporis of the minimum premium.

## **ARTICLE 15**

### **CURRENCY SETTLEMENTS**

All transactions hereunder shall be in the main currency specified in the schedule.

For the purpose of this Agreement all premiums received and/or claims paid by the Reinsured in currencies other than the main currency shall be converted into such currency at the rates of exchange used by the Reinsured for the purpose of their own accounts, or where there is a specific remittance for a loss settlement at the rates of exchange used in making such remittance.

## ARTICLE 16

### NOTIFICATION OF CLAIM

The Reinsured undertakes to advise the Reinsurers as soon as possible of any circumstances likely to give rise to a claim hereunder together with any estimate of the Reinsurer's liability and thereafter keep the Reinsurers fully informed of any developments regarding the claim.

## ARTICLE 17

### LOSS SETTLEMENTS

All loss settlements made by the Reinsured, provided same are within the terms of the original Policies or so deemed by a court of competent jurisdiction and within the terms of this Agreement, shall be unconditionally binding upon the Reinsurers and amounts falling to the share of the Reinsurers shall be payable by them upon reasonable evidence of the amount payable being given by the Reinsured.

### CLAIMS CONTROL

Notwithstanding the above, the course to be adopted by the Reinsured in connection with the defence or settlement of any claim or claims likely to exceed {AMOUNT} to the Reinsured's Net Account shall be determined between the Reinsured and the Leading Reinsurer or its representatives and the Reinsured shall not without the consent of the Leading Reinsurer or its representatives litigate any such claim or claims.

## ARTICLE 18

### JURISDICTION

Not notwithstanding anything contained herein to the contrary it is agreed that the indemnity provided herein shall not apply to compensation for damages in respect of judgements delivered or obtained by a court of competent jurisdiction within the United States of America or Canada.

## ARTICLE 19

### INSPECTION OF RECORDS

The Reinsurers may at any time during normal office hours inspect and take copies of such of the Reinsured's records and documents which relate to business covered under this Agreement. It is agreed that the Reinsurers rights of inspection shall continue as long as either party has a claim against the other arising out of this Agreement.

The Reinsurers shall regard the transactions under this Agreement as strictly confidential and shall not at any time, during its currency or thereafter, make any use, either directly or indirectly, of the information afforded of the business and connections of the Reinsured which shall or may in any way operate to the prejudice or detriment of the latter.

## ARTICLE 20

### ALTERATIONS AND AMENDMENTS

Any alterations which may from time to time become necessary to this Agreement may be made by addendum or by correspondence the documents embodying such alterations as may be mutually agreed upon being attached to this Agreement and forming an integral part thereof.

## ARTICLE 21

### PROPER LAW AND JURISDICTION

The validity construction and performance of this Agreement is to be governed by English Law and Jurisdiction. {OR STATE COUNTRY}

## ARTICLE 22

### ARBITRATION

All disputes arising out of the above Agreement or concerning its interpretations or validity whether arising before or after its termination shall be referred to a Court of Arbitration which shall consist of two Arbitrators who shall be active or retired officials of Companies or Underwriters carrying on a similar type of insurance

or reinsurance business to that covered hereunder; one to be appointed by each party, and an Umpire who shall be appointed by the Arbitrators immediately after they themselves shall have been appointed and in the event of the Arbitrators being unable to reach agreement on the reference the Umpire shall forthwith enter on the reference in lieu of the Arbitrators.

If either of the appointed Arbitrators for any reason whatsoever fails to act the party by whom he was appointed shall by writing appoint an Arbitrator in his place and if either party fails to appoint an Arbitrator within one month after being requested by the other party in writing to do so, or in the event of the Arbitrators failing to agree as to the appointment of the Umpire within one month after their own appointment such Arbitrators or Umpire as the case may be shall be appointed in writing by the Secretary General for the time being of the Court of Arbitration of the International Chamber of Commerce at the written request of either party.

The Arbitrators or Umpire as the case may be shall determine any reference in accordance with current reinsurance market practice pertaining during the period of this Agreement and in making their award shall at the same time decide as to the payment of the cost of the Arbitration.

The Court of Arbitration shall take place in London, England. {OR STATE CITY AND COUNTRY}

This Arbitration Agreement shall be construed as a separate and independent contract between the parties hereto and Arbitration hereunder shall be a condition precedent to the commencement of any action at law.

## ARTICLE 23

### INTERMEDIARIES CLAUSE

{NAME OF BROKER} are hereby recognised as the Intermediary negotiating this Agreement for all business hereunder. All communications and documents relating thereto shall be transmitted to the Reinsured and the Reinsurers through {NAME AND ADDRESS OF BROKER}.

## SCHEDULE

Attaching to and forming part of Reinsurance Agreement No.  
{POLICY NUMBER} for account of {NAME OF REINSURED}

### EXCESS:

(Article 4) {AMOUNT OF PRIORITY} Ultimate Net Loss each and every loss.

### LIMIT:

(Article 4) {AMOUNT OF LIMIT} Ultimate Net Loss each and every loss.

**SPECIAL CONDITIONS** : Exclusions: As per the attached list.

(Article 7)

### PREMIUM:

(Article 9) The rate of premium payable by the Reinsured to the Reinsurers shall be {RATE} % of the Gross Net Premium Income of the Reinsured for the period of this Agreement in respect of the classes of business covered hereunder.

It is understood and agreed that the Minimum and Deposit Premium for this Agreement shall be {AMOUNT} which the Reinsured shall pay to the Reinsurers half yearly in two equal instalments of {AMOUNT} on {DATE} and {DATE}.

As soon as practicable after {EXPIRY DATE} the Reinsured shall submit details of their Gross Net Premium Income and the premium hereon shall be calculated at the above rate. The Deposit Premium shall be adjusted accordingly subject always to the Minimum Premium of {AMOUNT}.

The term "Gross Net Premium Income" where used in this Agreement is understood to mean gross premiums accounted for during the period hereof less returned premiums, cancellations and premiums paid for reinsurances, recoveries under which inure to the benefit hereof.

**MAIN CURRENCY:**  
(Article 15)

In witness whereof both the Agreement and Schedule are made in duplicate and signed as under by each of the contracting parties signifying their Agreement to both documents.

For and on behalf of the Reinsured

This                    day of                    20

and for REINSURERS named in the individual Signing Schedules attached hereto.

The subscribing Reinsurers' obligations under contracts of reinsurance to which they subscribe are several and not joint and are limited solely to the extent of their individual subscriptions. The subscribing Reinsurers are not responsible for the subscription of any co-subscribing Reinsurer who for any reason does not satisfy all or part of its obligations.

## APPENDIX

Attaching to and forming part of Reinsurance Agreement No. {POLICY NO} for account of {NAME OF REINSURED}.

### EXCLUSIONS

This Agreement shall exclude:

Obligatory Reinsurances other than fronting arrangements.

Excess of Loss Reinsurances.

Nuclear Energy Risks as per Nuclear Energy Risks Exclusion Clause 1994 (NMA 1975(a)) as attached.

Seepage and Pollution as per Seepage and Pollution Clause NMA 1685 and NMA 1686 as attached.

Losses arising directly or indirectly out of war, invasion, acts of foreign enemies, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection, military or usurped power or confiscation or nationalisation or requisition or destruction of or damage to property by or under the order of any government or public or local authority.

The Specific Exclusions for each class of business covered hereunder shall be as follows:

### MOTOR

- a. Sports meetings, races and rallies including any form of competition in motor propelled vehicles.
- b. Vehicles not on terra firma.
- c. Loss or destruction of or damage to any property whatsoever or any loss or expense whatsoever resulting or arising therefrom or any consequential loss, or any legal liability of whatsoever nature directly or indirectly caused by or arising from ionising radiation or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel.

## WORKMEN'S COMPENSATION AND EMPLOYERS' LIABILITY

- a) Manufacture, storage, filling, breaking down of transport for fireworks, ammunition, fuses, cartridges, powder, nitro-glycerine or any explosives or gases and/or air under pressure. (It is understood and agreed however that the breaking down, storage and transport of any of the above substances which is merely incidental to the occupation and/or work and/or trade of the Insured is not excluded from this agreement).
- b) Miners.
- c) Ships and air crews. Notwithstanding these exclusions, policies in respect of ships' crews may be covered hereunder for vessels up to 1,500 tons and not exceeding fifteen crew members.
- d) Shipbuilding and ship repairing yards unless incidental.
- e) Construction and other work under water, unless incidental to the Insured's occupation or trade.

## GENERAL THIRD PARTY

- a) Operations and Navigation of ships (other than Light Craft, Ferries, or similar small vessels not exceeding 200 tons with a passenger carrying capacity of not more than 50 persons and plying solely in Inland or Coastal (ie within 3 miles of the coast) waters, docks and stevedoring risks shipbuilding and ship repairs.
- b) Manufacture, storage filling, breaking down of all kinds of explosives including fireworks, ammunition, fuses, cartridges, powder and nitro-glycerine.
- c) Underground mining and quarrying where explosives are used.
- d) Tunnels and Subaqueous works unless incidental.
- e) Gas or Electricity undertakings in respect of any liability arising from power cuts and the like.
- f) Dams and Coffer Dams

- g) All liability in respect of bodily injury or material damage resulting from operations for the exploration extracting refining storage or transport of liquid or gaseous fuels and/or air under pressure in containers although where storage and transport are merely incidental to the occupation or trade of the Insured they may be included under this agreement.
- h) Chemical Industries producing hazardous materials.
- i) Air transport and all liability for airport and firms engaged in air transport or in handling aeroplanes. However, if liability to aircraft and passengers is excluded then such business may be written.
- j) Products liability in respect of:
  1. Aircraft and/or aviation component manufacturers
  2. Pharmaceutical Manufacturers
  3. Manufacturers suppliers and/or distributors of (A) Chemicals/Petrochemicals of an explosive toxic or noxious nature (B) fertilisers pesticides fungicides and animal feeds other than where incidental to Insured's main business.
  4. Shipbuilders and ship repairers and manufacturers of machinery and/or components with Marine applications.
- k) All professional indemnity insurances unless incidental
- l) Motor Third Party Liability
- m) Exports to the U.S.A. and/or Canada, as defined in the Expona 3 Clause as attached.
- n) Products guarantee and recall.

## NUCLEAR ENERGY RISKS EXCLUSION CLAUSE (REINSURANCE) (1994)

(World-wide excluding USA. and Canada) - NMA 1975(a)

This Agreement shall exclude Nuclear Energy Risks whether such risks are written directly and/or by way of reinsurance and/or via Pools and/or Associations.

For all purposes of this Agreement Nuclear Energy Risks shall mean all first party and/or third party insurances or reinsurances (other than Workers' Compensation and/or Employers' Liability) in respect of:

- (i) All Property on the site of a nuclear power station.  
Nuclear Reactors, reactor buildings and plant and equipment therein on any site other than a nuclear power station.
- (ii) All Property, on any site (including but not limited to the sites referred to in (i) above) used or having been used for :
  - a) The generation of nuclear energy; or
  - b) The Production, Use or Storage of Nuclear Material
- (iii) Any other Property eligible for insurance by the relevant Nuclear Insurance Pool and/or Association but only to the extent of the requirements of the local Pool and/or Association.
- (iv) The supply of goods and services to any of the sites, described in (i) to (iii) above, unless such insurances or reinsurance shall exclude the perils of irradiation and contamination by Nuclear Material.

Except as undernoted, Nuclear Energy Risks shall not include :

- (i) Any insurance or reinsurance in respect of the construction or erection or installation or replacement or repair or maintenance or decommissioning of Property as described in (i) to (iii) above (including contractors' plant and equipment);
- (ii) Any Machinery Breakdown or other Engineering insurance or reinsurance not coming within the scope of (i) above;

Provided always that such insurance or reinsurance shall exclude the perils of irradiation and contamination by Nuclear Material.

However, the above exemption shall not extend to :

1. The provision of any insurance or reinsurance whatsoever in respect of:
  - (a) Nuclear Material;
  - (b) Any Property in the High Radioactivity Zone or Area of any Nuclear Installation as from the introduction of Nuclear Material or - for reactor installations - as from fuel loading or first criticality where so agreed with the relevant local Nuclear Insurance Pool and/or Association.
2. The provision of any insurance or reinsurance for the undernoted perils:
  - Fire, lightning, explosion;
  - Earthquake;
  - Aircraft and other aerial devices or articles dropped therefrom;
  - Irradiation and radioactive contamination;
  - Any other peril insured by the relevant local Nuclear Insurance Pool and/or Association;

in respect of any other Property not specified in (1) above which directly involves the Production, Use or Storage of Nuclear Material as from the introduction of Nuclear Material into such Property.

## Definitions

“Nuclear Material” means:

- (i) Nuclear fuel, other than natural uranium and depleted uranium, capable of producing energy by a self-sustaining chain process of nuclear fission outside a Nuclear Reactor, either alone or in combination with some other material; and

## (ii) Radioactive Products or Waste.

“Radioactive Products or Waste” means any radioactive material produced in, or any material made radioactive by exposure to the radiation incidental to the production or utilisation of nuclear fuel, but does not include radioisotopes which have reached the final stage of fabrication so as to be usable for any scientific, medical, agricultural, commercial or industrial purpose.

“Nuclear Installation” means:

- (i) Any Nuclear Reactor;
- (ii) Any factory using nuclear fuel for the production of Nuclear Material, or any factory for the processing of Nuclear Material, including any factory for the reprocessing of irradiated nuclear fuel; and
- (iii) Any facility where Nuclear Material is stored, other than storage incidental to the carriage of such material.

“Nuclear Reactor” means any structure containing nuclear fuel in such an arrangement that a self-sustaining chain process of nuclear fission can occur therein without an additional source of neutrons.

“Production, Use or Storage of Nuclear Material” means the production, manufacture, enrichment, conditioning, processing, reprocessing, use, storage, handling and disposal of Nuclear Material.

“Property” shall mean all land, buildings, structures, plant, equipment, vehicles, contents (including but not limited to liquids and gases) and all materials of whatever description whether fixed or not.

“High Radioactivity Zone or Area” means:

- (i) For nuclear power stations and Nuclear Reactors, the vessel or structure which immediately contains the core (including its supports and shrouding) and all the contents thereof, the fuel elements, the control rods and the irradiated fuel store; and
- (ii) For non-reactor Nuclear Installations, any area where the level of radioactivity requires the provision of a biological shield.

## **INDUSTRIES, SEEPAGE, POLLUTION AND CONTAMINATION EXCLUSION CLAUSE (NMA 1686)**

This Agreement does not cover any liability for:

- (1) Personal Injury or Bodily Injury or loss of, damage to or loss of use of property directly or indirectly caused by seepage, pollution or contamination.
- (2) The cost of removing, nullifying or cleaning up seeping, polluting or contaminating substances.
- (3) Fines, penalties, punitive or exemplary damages.

This Clause shall not extend this Agreement to cover any liability which would not have been covered under this Agreement had this Clause not been attached. The provisions of this Clause are only applicable to risks situated in the United States of America and Canada.

## **EMPLOYERS LIABILITY/WORKMEN'S COMPENSATION**

### **DEFINITION OF INDUSTRIAL DISEASE COVER**

Should the Reinsured incur liability under policies of Workmen's Compensation and Employers Liability for Industrial Disease or Physical Impairment which does not arise from a sudden and identifiable accident or event it is understood and agreed that for the purposes of this Agreement

- 1) each employee of an original insured shall be deemed to be a separate loss occurrence giving rise to an event  
and
- 2) each loss occurrence shall be deemed to have occurred on the date the original insured is advised of the claim following diagnosis of the Industrial Disease or Physical Impairment by a qualified medical practitioner.

## EXPONA 3

### PUBLIC AND PRODUCTS LIABILITY

#### NORTH AMERICAN EXPOSURE ETC EXCLUSION CLAUSE

This reinsurance shall expressly exclude:

1. Products Liability for an Insured which to the knowledge of the Reinsured at the time of the Reinsured's acceptance exports products to the U.S.A. and/or Canada.
2. U.S.A. and/or Canada domiciled risks including branches subsidiaries agencies and sales outlets of non-U.S.A./ Canadian Insureds.
3. Professional liabilities of whatsoever kind including Directors and Officers Errors and Omissions and Medical Malpractice.
4. Assumed reinsurance of whatsoever kind other than facultative reinsurance.
5. Liability arising from loss portfolio transfers of any kind.
6. Public and/or Products liability policies which do not limit the interpretation of all terms conditions exclusions and limitations to courts domiciled other than within the legal jurisdiction of the U.S.A. and/or Canada.
7. Products Liability (whether written as such or as an extension to a public liability policy) whose limit of indemnity does not compromise the Reinsured's maximum liability in all and in the aggregate for any one annual period.

## **Marine Cargo and Hull Excess of Loss**

### **REINSURANCE CONTRACT**

between

(hereinafter called the “Reinsured”)

and

### **INSURANCE AND REINSURANCE COMPANIES**

as per INDIVIDUAL Signing Schedules attached hereto

(hereinafter called the “Reinsurer”)

This reinsurance is to cover the liability of the Reinsured under all policies and/or contracts of Insurance and/or Reinsurance in respect of all losses howsoever and wheresoever arising anywhere in the world on business written and retained net in the Reinsured’s Marine Cargo and Hull Departments, of all insurances and/or coinsurance from all insurance companies and/or agencies and/or concerns in {COUNTRY}, including Strikes, Riots, Civil Commotion and Malicious Damage Risks. Subject, however, to the exclusions mentioned in the Appendix and to the following terms and conditions.

It is warranted that in respect of hull risks that coverage hereunder is limited to vessels of {NATIONALITY} Flag and/or Ownership and/or Management.

## ARTICLE I

### REINSURING CLAUSE

This reinsurance is only to pay the excess of an Ultimate Net Loss to the Reinsured of {PRIORITY} each and every loss occurrence with a limit of liability to the Reinsurers of {LIMIT} each and every loss as more fully defined in Article V1.

## ARTICLE II

### EXTENSION OF PROTECTION CLAUSE

If this reinsurance should expire whilst a loss and/or occurrence and/or catastrophe and/or disaster and/or calamity and/or series of losses and/or occurrences and/or catastrophes and/or disasters and/or calamities arising out of one event is in progress, it is agreed that subject to the other conditions of this reinsurance, the Reinsurers shall pay their proportion of the entire loss or damage, provided that the loss and/or occurrence and/or catastrophe and/or disaster and/or calamity and/or series of losses and/or occurrences and/or catastrophes and/or disasters and/or calamities arising out of one event commenced before the time of expiration of this Reinsurance, provided that no part of that loss is claimed against any renewal of this Agreement.

## ARTICLE III

### PERIOD OF REINSURANCE CLAUSE

This Reinsurance covers all losses as herein defined occurring during the period commencing with the {INCEPTION DATE} and ending with the {EXPIRY DATE} both days inclusive, Local Standard Time at the place where the loss occurs.

## ARTICLE IV

### ULTIMATE NET LOSS CLAUSE

The term "Ultimate Net Loss" means the sum which the Reinsured actually pay in settlement of claims and/or suit and/or in satisfaction of judgements, including expenses of litigation and/or all other loss expenses of the Reinsured (except expenses of their offices and

salaried employees) after deduction of salvages and/or recoveries, including recoveries under other Reinsurances.

All salvages, recoveries or payments recovered or received subsequent to a loss settlement under this Reinsurance shall be applied as if recovered or received prior to the aforesaid settlement and all necessary adjustments shall be made by the parties hereto.

Notwithstanding anything to the contrary contained herein it is hereby agreed that nothing in this Clause shall be construed to mean that losses are not recoverable from the Reinsurer until the Ultimate Net Loss to the Reinsured has been determined.

The amount of the Reinsurer's liability in respect of any loss or losses shall not be increased by reason of the inability of the Reinsured to collect from any other Reinsurers, whether specific or general any amounts which may have become due from them whether such inability arises from the insolvency of such other Reinsurers or otherwise. The Reinsured may include in his Ultimate Net Loss his proportion of a "one loss occurrence" as defined in respect of Policies on an aggregate basis such proportion being determined by ascertaining the percentage which such individual loss occurrence bears to the total amount of the aggregate losses involved and applying such percentage to the amount paid, or payable by the Reinsured. Such calculations to be based on the figures available at the time the Reinsured settles the original claim, subject to any subsequent readjustment.

## ARTICLE V

### RUN-OFF CLAUSE

In the event of this Reinsurance not being renewed, if requested by the Reinsured prior to expiry of this Reinsurance, it is hereby agreed to extend this Reinsurance to cover the liability of the Reinsured in respect of losses occurring during the twelve month period immediately following expiry of this Reinsurance arising under Policies and/or Contracts written or renewed by the Reinsured prior to expiry of this Reinsurance. In the event of the Reinsured exercising this option an Additional Premium to be mutually agreed, shall be payable to the Reinsurer. Notwithstanding anything contained in the foregoing in the event of the Reinsured and the Reinsurer failing to

agree on the amount of Additional Premium mentioned above this Reinsurance shall terminate at the end of the period stated in the Reinsuring Clause.

## ARTICLE VI

### DEFINITION OF EACH AND EVERY LOSS

For the purpose of this Reinsurance the term "each and every loss" shall be deemed to mean "each and every loss and/or occurrence and/or calamity and/or disaster and/or catastrophe and/or series of any thereof arising out of one event".

## ARTICLE VII

### NET RETAINED LINES CLAUSE

This Reinsurance applies only to that portion of any insurance or reinsurance which the Reinsured retains net for its own account, and in calculating the amount of any loss hereunder and also computing the amount or amounts in excess of which this Reinsurance attaches, only loss or losses in respect of any insurance or reinsurance which the Reinsured retains net for its account shall be included.

## ARTICLE VIII

### PREMIUM CLAUSE

The Reinsured shall pay a deposit premium of {AMOUNT} in {NUMBER} equal instalments in advance at {DATES}.

As soon as possible after the expiry of this Agreement the above deposit premium shall be adjusted to an amount equal to a rate of {RATE} % applied to the Reinsured's Gross Net Retained Premium Income as defined below, subject however to a minimum premium of {AMOUNT}. The payment of any adjustment due between the parties shall be made at once.

The term Gross Net Retained Premium Income shall mean the gross premiums accounted for by the Reinsured on business protected hereunder during the period of this Agreement, less only returned premiums and premiums paid for reinsurances recoveries under which inure to the benefit hereof.

## ARTICLE IX

### REINSTATEMENT CLAUSE

In the event of loss or losses occurring under this Reinsurance it is hereby mutually agreed to reinstate this Reinsurance to its full amount of {LIMIT} from the time of such loss or losses until expiry of this Reinsurance. Such reinstatement shall be made subject to an additional premium calculated at 100% of the full annual premium, reduced pro rata in the same proportion that the amount of loss bears to the full limit of this Reinsurance.

But nevertheless the Reinsurer shall never be liable for more than {LIMIT} in respect of any one loss, as defined nor for more than {TOTAL AMOUNT OF LIMIT PLUS ALL REINSTATEMENTS} in respect of all losses during the period of this Reinsurance.

Such reinstatement shall include any reinstatement of losses sustained by the Reinsured in respect of War Risks which shall be subject of the provisions of the "War Inclusion Clause".

## ARTICLE X

### WAR INCLUSION CLAUSE

- (a) This Clause includes loss, damage, liability or expense caused by or resulting from the risks of War as covered in the original policy(ies) provided that such loss, damage, liability or expense would be recoverable under the terms and conditions of the relevant Institute War Clauses or War sections of the relevant Institute War and Strikes Clauses or relevant London aviation clauses in current use at the inception of this Reinsurance or at the time when the War risks cover would have commenced under the original insurance within the terms of these clauses, whichever is the earlier, except that if the risks of War are covered in the original Policy(ies) under clauses approved by the London Hull War Risks Joint Subcommittee, or in respect of Cargo interests under the Standard War Risks Clause of any country which complies with the limitations of the United Kingdom Waterborne Agreement, the foregoing proviso shall not apply.

- (b) In the event of loss or losses occurring under this section of the Reinsurance (War Inclusion Clause) the Reinsurance shall be automatically reinstated to its full amount from the time of such loss or losses until expiry of the Reinsurance in accordance with the general reinstatement conditions of the Reinsurance. Nevertheless, and irrespective of any other reinstatement conditions of the Reinsurance the Reinsurer shall never be liable for more than {LIMIT} in respect of any one loss nor for more than {TWICE THE LIMIT} in respect of all losses coming within this section of the Reinsurance and which occur during the period of this Reinsurance, subject however to such overall limitation of cover as may be stipulated in the general reinstatement conditions of this Reinsurance.

## ARTICLE XI

### INSPECTION OF RECORDS

No further particulars shall be required by the Reinsurer but the books of the Reinsured, so far as they concern the insurances or Reinsurances falling within the scope of this Reinsurance, shall be open to the inspection of an authorised representative of the Reinsurer at any reasonable time during the continuance of this Reinsurance or of any liability hereunder.

## ARTICLE XII

### AMENDMENTS AND ALTERATIONS

It is hereby understood and agreed that any amendments and/or alterations to this Reinsurance that are agreed, either by correspondence and/or Broker's Slip endorsements, shall be automatically binding hereon and shall be considered to form an integral part hereof. All amendments and alterations will be promulgated by Addendum as soon as possible.

## ARTICLE XIII

### CURRENCY SETTLEMENTS CLAUSE

All transactions hereunder shall be in {CURRENCY} and all premiums received or claims paid by the Reinsured in currencies other than

{CURRENCY} shall be converted at the rate of exchange as shown in the books of the Reinsured.

## ARTICLE XIV

### CLAIMS CLAUSE

In the event of a claim arising hereunder notice shall be given to the Reinsurer through {NAME OF BROKER}, as soon as practicable, but inadvertent error or omission of such notification shall not prejudice this Reinsurance.

All loss settlements made by the Reinsured, shall be binding upon the Reinsurer provided that such settlements are within the terms and conditions of the original policies and within the terms of this Reinsurance and amounts falling to the share of the Reinsurer shall be payable by them upon reasonable evidence of the amount paid being given by the Reinsured.

## ARTICLE XV

### LOSSES DISCOVERED OR CLAIMS MADE CLAUSE

It is understood and agreed that as regards losses arising under Policies and/or Contracts covering on a "Losses Discovered" or "Claims Made" basis, that is to say Policies and/or Contracts in which the date of discovery of the loss or the date when the claim is made determines under which Policy or Contract the loss is collectible, such losses are covered hereunder irrespective of the date on which the loss occurs provided that the date of the discovery of the loss, in respect of Policies and/or Contracts on a "Losses Discovered" basis or the date the claim is made, in respect of Policies and/or Contracts on a "Claims Made" basis, falls within the period of this Reinsurance.

For the purpose of the foregoing the date of the first discovery of a loss occurrence or the date a claim is first made, shall be the date applicable to the entire loss and the Reinsurer shall be liable for their proportion of the entire loss irrespective of the expiry date of this Reinsurance provided that such date falls within the period of this Reinsurance.

## ARTICLE XVI

### SPECIAL CANCELLATION PROVISIONS CLAUSE

- (1) Either party shall have the right to terminate this Reinsurance immediately by giving the other party notice:
- (a) If the performance of the whole or any part of this Reinsurance be prohibited or rendered impossible de jure or de facto in particular and without prejudice to the generality of the preceding words in consequence of any law or regulation which is or shall be in force in any country or territory or if any law or regulation shall prevent directly or indirectly the remittance of any or all or any part of the balance of payments due to or from either party.
  - (b) If the other party has become insolvent or unable to pay its debts or has lost the whole or any part of its paid up capital.
  - (c) If there is any material change in the ownership or control of the other party.
  - (d) If the country or territory in which the other party resides or has its head office or is incorporated shall be involved in armed hostilities with any other country whether war be declared or not or is partly or wholly occupied by another power.
  - (e) If the other party shall have failed to comply with any of the terms and conditions of this Agreement.

All notices of termination in accordance with any of the provisions of this paragraph shall be by Telex or Telegram and shall be deemed to be served upon despatch or where communications between the parties are interrupted upon attempted despatch.

- (2) All notices of termination served in accordance with any of the provisions of this Article shall be addressed to the party concerned at its head office or at any other address previously designated by that party.

- (3) In the event of this Reinsurance being terminated at any date other than that stated in Article III then the premium due to the Reinsurer shall be calculated upon the premium income of the Reinsured up to date of termination or pro rata temporis of the annual minimum premium, whichever is the greater. The rights and obligations of both parties to this Reinsurance shall remain in full force until the effective date of termination.

## ARTICLE XVII

### NUCLEAR ENERGY RISKS EXCLUSION CLAUSE (MARINE) - M/26/B

This reinsurance shall exclude Nuclear Energy Risks whether such risks are written directly and/or by way of reinsurance and/or via Pools and/or Associations.

For all purposes of this reinsurance Nuclear Energy Risks shall be defined as all first party and/or third party insurances (other than Workers' Compensation and/or Employers' Liability) in respect of:

- (i) Nuclear reactors and nuclear power stations or plant;
- (ii) Any other premises or facilities whatsoever related to or concerned with:
  - (a) the production of nuclear energy or
  - (b) the production or storage or handling of nuclear fuel or nuclear waste;
- (iii) Any other premises or facilities eligible for insurance by any local Nuclear Pool and/or Association but only to the extent of the requirements of the local Pool and/or Association, it being the intention always that the Reinsurer shall follow the fortunes of the Reinsured insofar as the Reinsured complies with the requirements of any such local Pool and/or Association;
- (iv) Nuclear and/or radioactive fuel or nuclear and/or radioactive waste.

However, this Exclusion shall not apply.

- (a) to any insurance or reinsurance in respect of the construction, erection or installation of buildings, plant and other property

- (including contractor's plant and equipment used in connection therewith).
- (i) for the storage of nuclear fuel - prior to the commencement of storage
  - (ii) as regards reactor installations - prior to the commencement of loading of nuclear fuel into the reactor, or prior to the initial criticality, depending on the commencement of the insurance or reinsurance of the relevant local Nuclear Pool and/or Association.
- (b) to any Machinery Breakdown or other Engineering insurance or reinsurance not coming within the scope of (a) above, nor affording coverage in the "high radioactivity" zone;
  - (c) to any insurance or reinsurance in respect of the Hulls of ships and/or aircraft and/or conveyances;
  - (d) to any insurance or reinsurance in respect of loss of or damage to (including any expenses incurred therewith) nuclear and/or radioactive fuel or nuclear or radioactive waste whilst in transit as cargo.

## ARTICLE XVIII

### NON-MARINE LIABILITY EXCLUSION CLAUSE (1/10/87 AMENDED)

This Reinsurance excludes claims for

1. products liability, unless written on a "claims made" basis within general liability policies; this exclusion of products liability shall not apply to marine vessels, craft, offshore installations or aircraft
2. directors' and officers' liability
3. liability under the Securities Exchange Act
4. professional indemnity and errors and omissions, unless directly related to:
  - owning or handling ships, cargoes or goods in transit
  - classification societies or marine surveyors.

## ARTICLE XIX

### EXCESS LOSS AGGREGATE VOYAGE EXTENSION CLAUSE (CARGO)

The Reinsured may, if he requires, aggregate cargo losses of the same nature (including liability for such loss or damage, and related expenses including general average contribution, salvage charges and expenses incurred to avert or minimise such loss or damage) and treat them as losses arising out of one event provided that

it is not possible to determine the quantum of loss applicable to separate occurrences or events,

and

that such losses are in respect of cargo carried in the same vessel for the same or an overlapping voyage.

The date of loss in such cases shall be deemed to be the date of arrival at the port of discharge of such cargo or the date of discovery of loss if earlier. If such cargo is discharged at more than one port, the date of loss shall be deemed to be the date of arrival at the first port of discharge or the date of discovery of loss if earlier.

Claims paid by the Reinsured in respect of any interests other than cargo as described above are specifically excluded from the protection afforded by this Clause.

The Reinsurer's liability hereunder in respect of any one such aggregate loss is subject to the terms and conditions of this reinsurance, and shall not exceed the limit of indemnity provided herein in respect of each loss.

## ARTICLE XX

### SEEPAGE AND POLLUTION EXCLUSION CLAUSE (01.01.89) (M/31/D)

This Reinsurance excludes any loss arising from seepage, pollution or contamination on land unless such risks are insured solely on a sudden and accidental basis. This contract also excludes liability in respect of disposal or dumping of any waste materials or substances.

These exclusions shall not apply to coverage provided in respect of:

- (a) control of well policies where such seepage, pollution or contamination follows a well out of control above the surface of the ground or water bottom;
- (b) liability under
  - (1) Offshore Pollution Liability Agreement
  - (2) Outer Continental Shelf Lands Act,
  - Federal Water Quality Improvement Act,
  - Arctic Waters Pollution Protection Act,
- (3) Seepage, pollution or contamination covered by Protection and Indemnity policies,
- (4) Aviation policies subject to clauses no less restrictive than AVN 46B.

## ARTICLE XXI

### INSTITUTE RADIOACTIVE CONTAMINATION

#### EXCLUSION CLAUSE (CI.356) 01.10.90.

This clause shall be paramount and shall override anything contained in this insurance inconsistent therewith

- 1) In no case shall this insurance cover loss, damage, liability or expense directly or indirectly caused by or contributed to by or arising from
  - i) ionising radiations from or contamination by radioactivity from any nuclear fuel or from any nuclear waste or from the combustion of nuclear fuel
  - ii) the radioactive, toxic, explosive or other hazardous or contaminating properties of any nuclear installation, reactor or other nuclear assembly or nuclear component thereof

- iii) any weapon of war employing atomic or nuclear fission and/or fusion or other like reaction or radioactive force or matter.

## RADIOACTIVE CONTAMINATION EXCLUSION CLAUSE

### (U.S.A. ENDORSEMENT)

This insurance (reinsurance) is subject to the Institute Radioactive Contamination Exclusion Clause 1/10/90 provided that

if fire is an insured peril

and

where the subject matter insured or, in the case of a reinsurance, the subject matter insured by the original insurance, is within the U.S.A., its islands, onshore territories or possessions

and

a fire arises directly or indirectly from one or more of the causes detailed in Sub-Clauses 1.1 and 1.2 of the Institute Radioactive Contamination Exclusion Clause 1/10.90.

any loss or damage arising directly from that fire shall, subject to the provisions of this insurance (reinsurance), be covered, EXCLUDING however any loss damage liability or expense caused by nuclear reaction nuclear radiation or radioactive contamination arising directly or indirectly from that fire.

## ARTICLE XXII

### LIABILITY EXCLUSION CLAUSE "B" 1/12/90 (in respect of risks attaching on or after 1<sup>st</sup> January 1991)

This Reinsurance excludes claims in respect of sums which any original assured becomes liable to pay to any other party, unless arising from those policies underwritten by the original Insurer on a "claims made" or "losses discovered" basis, and then only where the original claim, or notification of the event giving rise to the claim, is "made" or loss "discovered" during the period of this contract.

Notwithstanding the foregoing this clause shall not exclude claims arising from

1. The ownership, management, operation or chartering of marine or inland waterway vessels, craft or units;
2. the construction, repair or demolition of marine or inland waterway vessels, craft or units and all related components;
3. operations in respect of bridges, tunnels, sea walls, marine terminals, ports, harbours, wharves, piers, jetties, docks, berths, pontoons, marinas, fish farms, stevedores, divers, marine agents and boat dealers;
4. offshore exploration, drilling or production, including all related construction operations;
5. construction, refurbishment, conversion or demolition, but in respect of onshore risks only where policies contain a discovery or cut-off clause effective no more than 36 months after expiry of the policy and any completed operations cover afforded therein;
6. the ownership, management or operation of aircraft or airports;
7. construction of aircraft and all related components;
8. transit, and storage in the ordinary course of transit, of cargo by sea or air, and by land conveyance other than pipeline;
9. onshore workers' compensation or employers' liability losses arising from the following perils:  
Fire, lightning, explosion, structural collapse, windstorm, hail, flood, seismic activity, volcanic eruption, collision, riots, strikes, civil commotion, malicious damage;
10. any cover for physical loss, damage or consequential loss contingent thereon effected by an original assured on behalf of another party.

Notwithstanding anything contained herein to the contrary, this contract excludes:

- directors' and officers' liability;
- liability under the Securities Exchange Act;
- professional indemnity and errors and omissions, unless directly related to:
  - owning or handling ships, cargoes or goods in transit; classification societies or marine surveyors.

The Reinsurers' liability hereunder is subject to the terms, conditions and exclusions of this contract, and shall not exceed the limit of indemnity provided herein in respect of each loss.

### ARTICLE XXIII

#### COLLUSION AMENDMENT (01.04.89)

The Reinsured may aggregate settlements in respect of loss to any single original assured arising from infidelity or fraud committed by any person acting alone or by persons acting in collusion, whether incurred in respect of

- claims on original policies; or
- under the terms of any reinsurance.

Such settlements may not be aggregated under this contract if they have been settled

- a) as separate losses under the original policies, or
- b) under separate original policy years.

Nevertheless settlements defined under b) shall be admissible for that portion of any loss which is attributable to any one original policy year.

The date of loss shall be determined by treating the loss as arising on the date of first discovery of loss by the original assured.

## ARTICLE XXIV

## ARBITRATION

All disputes arising out of this Reinsurance or concerning its interpretations or validity whether arising before or after its termination shall be referred to a Court of Arbitration which shall consist of two Arbitrators who shall be active or retired officials of Companies or underwriters carrying on a similar type of insurance or reinsurance business to that covered hereunder; one to be appointed by each party, and an Umpire who shall be appointed by the Arbitrators immediately after they themselves shall have been appointed and in the event of the Arbitrators being unable to reach agreement on the reference the Umpire shall forthwith enter on the reference in lieu of the Arbitrators.

If either of the appointed Arbitrators for any reason whatsoever fails to act the party by whom he was appointed shall by writing appoint an Arbitrator in his place and should either party fail to appoint an arbitrator within one month after being requested by the other part in writing to do so, or in the event of the Arbitrators failing to agree as to the appointment of the Umpire within one month after their own appointment such Arbitrator or Umpire as the case may be shall be appointed in writing by the Secretary General for the time being of the Court of Arbitration of the International Chamber of Commerce at the written request of either party.

The Arbitrators or Umpire as the case may be shall determine any reference in accordance with current reinsurance market practice pertaining during the period of this Agreement and in making their award shall at the same time decide as to the payment of the cost of the arbitration The Court of Arbitration shall take place in the country in which the head office of the Reinsured party is situated and the law applicable to both the aforesaid Agreement and this arbitration agreement shall be the law of that country.

This arbitration agreement shall be construed as a separate and independent contract between the parties hereto and arbitration hereunder shall be a condition precedent to the commencement of any action at law.

## ARTICLE XXV

## SEVERAL LIABILITY NOTICE (LSW 1001)

The subscribing Reinsurers' obligations under contracts of reinsurance to which they subscribe are several and not joint and are limited solely to the extent of their individual subscriptions. The subscribing Reinsurers are not responsible for the subscription of any co-subscribing Reinsurer who for any reason does not satisfy all or part of its obligations.

## ARTICLE XXVI

## **INTERMEDIARY CLAUSE**

{NAME AND ADDRESS OF BROKER} are recognised as the Broker negotiating this Reinsurance through whom all premiums, losses, documents and communications relating thereto shall be transmitted to both parties.

Signed in this day of 20

for and on behalf of the Reinsured

and for and on behalf of the Reinsurer as per the attached signing schedules.

## General Catastrophe Excess of Loss

CATASTROPHE EXCESS OF LOSS REINSURANCE AGREEMENT

made between

{NAME OF REINSURED}

(hereinafter referred to as the "Reinsured")

of the one part

and

UNDERWRITING MEMBERS OF LLOYD'S and/or

CERTAIN INSURANCE and/or REINSURANCE COMPANIES

named in the individual Signing Schedules attached hereto.

(hereinafter referred to as the "Reinsurers")

of the other part

### ARTICLE 1

#### PERIOD CLAUSE

This Reinsurance shall be effective in respect of all loss or losses occurring during the period commencing {INCEPTION DATE} and ending {EXPIRY DATE} both days inclusive, Local Standard Time.

### ARTICLE 2

#### EXTENDED EXPIRATION CLAUSE

Reinsurers agree that if this Reinsurance should expire whilst a loss to the Reinsured is in progress, then Reinsurers shall be liable as if the whole loss had occurred during the currency of this Reinsurance, provided that no part of any loss shall be claimed against any renewal of this Reinsurance.

## ARTICLE 3

### INTEREST CLAUSE

This Reinsurance shall apply to all policies and binders of insurance and/or reinsurance written and retained net by the Reinsured in their Fire Department either Direct or by way of Facultative Reinsurance.

Notwithstanding anything contained herein to the contrary this Reinsurance excludes:

- (1) Loss or damage occasioned by or through or in consequence directly or indirectly of any of the following occurrences, namely:
  - (a) war, invasion, act of foreign enemy, hostilities or warlike operations (whether war be declared or not) civil war;
  - (b) mutiny, civil commotion assuming the proportion of or amounting to a popular rising, military rising, insurrection, rebellion, revolution, military or usurped power, or any act of any person or persons acting on behalf of or in connection with any organisation the objects of which are to include the overthrowing or influencing of any de jure or de facto government by terrorism or by any violent means.
- (2) Nuclear Energy Risks as per the NUCLEAR ENERGY EXCLUSION CLAUSE (Reinsurance) (1994) - NMA 1975a

This Reinsurance shall exclude Nuclear Energy Risks whether such risks are written directly and/or by way of reinsurance and/or via Pools and/or Associations.

For all purposes of this Reinsurance Nuclear Energy Risks shall mean all first party and/or third party insurances or reinsurances (other than Workers' Compensation and Employers' Liability) in respect of:

- (i) All Property on the site of a nuclear power station.  
Nuclear Reactors, reactor buildings and plant and equipment therein on any site other than a nuclear power station.

- (ii) All Property, on any site (including but not limited to the sites referred to in (i) above) used or having been used for:
  - (a) The generation of nuclear energy; or
  - (b) The Production, Use or Storage of Nuclear Material.
- (iii) Any other Property eligible for insurance by the relevant local Nuclear Insurance Pool and/or Association but only to the extent of the requirements of that local Pool and/or Association.
- (iv) The supply of goods and services to any of the sites, described in (i) to (iii) above, unless such insurances or reinsurances shall exclude the perils of irradiation and contamination by Nuclear Material.

Except as undernoted, Nuclear Energy Risks shall not include:

- (i) Any insurance or reinsurance in respect of the construction or erection or installation or replacement or repair or maintenance or decommissioning of Property as described in (i) and (iii) above (including contractors' plant and equipment);
- (ii) Any Machinery Breakdown or other Engineering insurance or reinsurance not coming within the scope of (i) above;

Provided always that such insurance or reinsurance shall exclude the perils of irradiation and contamination by Nuclear Material.

However, the above exemption shall not extend to:

- (1) The provision of any insurance or reinsurance whatsoever in respect of:
  - (a) Nuclear Material;
  - (b) Any Property in the High Radioactivity Zone or Area of any Nuclear Installation as from the introduction of Nuclear Material or - for reactor installations - as

from fuel loading or first criticality where so agreed with the relevant local Nuclear Insurance Pool and/or Association.

- (2) The provision of any insurance or reinsurance for the undernoted perils:
- Fire, lightning, explosion;
  - Earthquake;
  - Aircraft and other aerial devices or articles dropped therefrom.
  - Any other peril insured by the relevant local Nuclear Insurance Pool and/or Associations;
- in respect of any other Property not specified in (1) above which directly involves the Production, Use or Storage of Nuclear Material as from the introduction of Nuclear Material into such Property.

### Definitions

“Nuclear Material” means:

- (i) Nuclear fuel, other than natural uranium and depleted uranium, capable of producing energy by a self-sustaining chain process of nuclear fission outside a Nuclear Reactor, either alone or in combination with some other material; and
- (ii) Radioactive Products or Waste.

“Radioactive Products or Waste” means any radioactive material produced in, or any material made radioactive by exposure to the radiation incidental to the production or utilisation of nuclear fuel, but does not include radioisotopes which have reached the final stage of fabrication so as to be usable for any scientific, medical, agricultural, commercial or industrial purpose.

“Nuclear Installation” means:

- (i) Any Nuclear Reactor;
- (ii) Any factory using nuclear fuel for the production of Nuclear Material, or any factory for the processing of Nuclear Material, including any factory for the reprocessing of irradiated nuclear fuel; and
- (iii) Any facility where Nuclear Material is stored, other than storage incidental to the carriage of such material.

“Nuclear Reactor” means any structure containing nuclear fuel in such an arrangement that a self-sustaining chain process of nuclear fission can occur therein without an additional source of neutrons.

“Production, Use or Storage of Nuclear Material” means the production, manufacture, enrichment, conditioning, processing, reprocessing, use, storage, handling and disposal of Nuclear Material.

“Property” shall mean all land, buildings, structures, plant, equipment, vehicles, contents (including but not limited to liquids and gases) and all materials of whatever description whether fixed or not.

“High Radioactivity Zone or Area” means:

- (i) For nuclear power stations and Nuclear Reactors, the vessel or structure which immediately contains the core (including its supports and shrouding) and all the contents thereof, the fuel elements, the control rods and the irradiated fuel store; and
- (ii) For non-reactor Nuclear Installations, any area where the level of radioactivity requires the provision of a biological shield.

- (3) Seepage and Pollution risks as per the INDUSTRIES, SEEPAGE, POLLUTION AND CONTAMINATION EXCLUSION CLAUSE

This Reinsurance does not cover any liability for:

- (1) Personal Injury or Bodily Injury or loss of, damage to, or loss of use of property directly or indirectly caused by seepage, pollution or contamination, provided always that this paragraph (1) shall not apply to liability for Personal Injury or Bodily Injury or loss of or physical damage to or destruction of tangible property, or loss of use of such property damaged or destroyed, where such seepage, pollution or contamination is caused by a sudden unintended and unexpected happening during the period of this Reinsurance.
- (2) The cost of removing, nullifying or cleaning up seeping, polluting or contaminating substances unless the seepage, pollution or contamination is caused by sudden, unintended and unexpected happening during the period of this Reinsurance.
- (3) Fines, penalties, punitive or exemplary damages.

This Clause shall not extend this Reinsurance to cover any liability which would not have been covered under this Reinsurance had this Clause not been attached.

- (4) Excess of Loss Reinsurance as per Excess of Loss Exclusion Clause.

This Reinsurance in no way applies to protect any liability of the Reinsured other than in respect of Direct, Facultative and Domestic Retrocession business, as defined in Article 3. Liability in respect of excess of loss reinsurances is excluded from the protection of this Reinsurance and cannot be taken into account in arriving at the amount excess of which liability attaches hereto.

- (5) All Liability and/or Casualty Business.

## ARTICLE 4

### TERRITORIAL LIMITS CLAUSE

It is hereby understood and agreed that this Reinsurance shall apply to losses occurring on risks situated in {COUNTRY} and incidental interests abroad.

## ARTICLE 5

### EXCESS LOSS CLAUSE

The Reinsurers shall only be liable if and when the Ultimate Net Loss sustained by the Reinsured in respect of Interest as defined herein exceeds {PRIORITY} Ultimate Net Loss each and every loss occurrence.

Reinsurers shall thereupon be liable for the amount of the excess thereof in each and every such instance, but their liability under this Reinsurance is limited to {LIMIT} Ultimate Net Loss each and every loss occurrence.

However, it is warranted that two or more risks must be involved in the same loss occurrence before recovery can be effected hereunder.

## ARTICLE 6

### DEFINITION OF LOSS OCCURRENCE CLAUSE

For the purposes of this Reinsurance the term "loss occurrence" shall be understood to mean each and every loss and/or series thereof arising out of one event.

However the duration and extent of any one "loss occurrence" so defined shall be limited to:

- (a) 72 consecutive hours as regards hurricane, typhoon, windstorm, rainstorm, hailstorm and/or tornado
- (b) 72 consecutive hours as regards earthquake, seaquake, tidal wave and/or volcanic eruption

- (c) 72 consecutive hours and within the limits of one City, Town or Village as regards riots, civil commotions and malicious damage
- (d) 72 consecutive hours as regards any "loss occurrence" which includes individual loss or losses from any of the perils mentioned in (a), (b) and (c) above
- (e) 168 consecutive hours for any "loss occurrence" of whatsoever nature which does not include individual loss or losses from any of the perils mentioned in (a), (b) and (c) above

and no individual loss from whatever Insured peril, which occurs outside these period or areas, shall be included in that "loss occurrence".

The Reinsured may choose the date and time when any such period of consecutive hours commences and, if any event is of greater duration than the above periods, the Reinsured may divide that event into two or more "loss occurrences" provided that no two periods overlap and provided no period commences earlier than the above stated date and time of the first recorded individual loss affecting this Reinsurance in that event.

## ARTICLE 7

### ULTIMATE NET LOSS CLAUSE

The term "Ultimate Net Loss" shall mean the sum actually paid by the Reinsured in respect of any loss occurrence including expenses of litigation, if any, and all other loss expenses of the Reinsured (excluding, however, office expenses and salaries of officials of the Reinsured) but salvages and recoveries, including recoveries from all other reinsurances, other than any underlying reinsurance, shall be first deducted from such loss to arrive at the amount of liability, if any, attaching hereunder.

All salvages, recoveries or payments recovered or received subsequent to any loss settlement hereunder shall be applied as if recovered or received prior to the aforesaid settlement, and all necessary adjustments shall be made by the parties hereto. Nothing in this Article shall be construed to mean that a recovery cannot be

made hereunder until the Reinsured's Ultimate Net Loss has been ascertained.

It is understood and agreed that the Reinsured have underlying reinsurances, recoveries under which inure to their sole benefit.

## ARTICLE 8

### NET RETAINED LINES CLAUSE

This Reinsurance applies only to that part of the original policies which the Reinsured retain net for their own account, and in computing the Ultimate Net Loss, only loss or losses in respect of such net retained part of the original policies shall be included.

The amount of Reinsurers' liability in respect of any loss or losses shall not be increased by reason of the inability of the Reinsured to collect from any other Reinsurers whether specific or general, any amounts which may have become due from them whether such inability arises from the insolvency of such other Reinsurers or for any other reason whatsoever.

## ARTICLE 9

### NOTIFICATION OF LOSS CLAUSE

The Reinsured undertake to advise the Reinsurers as soon as possible of any circumstances likely to give rise to a claim hereunder.

## ARTICLE 10

### ERRORS AND OMISSIONS CLAUSE

Any inadvertent error or omission on the part of either the Reinsured or the Reinsurers shall not relieve the other party from any liability which would have attached hereunder, provided that such error or omission is rectified as soon as possible after discovery.

Nevertheless, nothing contained in this Article shall be held to override specific terms and conditions of this Reinsurance, and no liability shall be imposed on the other party greater than would have attached hereunder had such error or omission not occurred.

## ARTICLE 11

### SETTLEMENTS CLAUSE

Reinsurers shall be bound unconditionally by all loss settlements made by the Reinsured, including compromise settlements, provided such settlements are within the terms and conditions of the original policies and of this Reinsurance and amounts falling to the share of the Reinsurers shall be payable by them upon reasonable evidence of the amount paid being given by the Reinsured.

## ARTICLE 12

### CURRENCY CONVERSION CLAUSE

All transactions hereunder shall be in the main currency specified in the schedule.

For the purpose of this Agreement all premiums received and/or claims paid by the Reinsured in currencies other than the main currency shall be converted into such currency at the rates of exchange used by the Reinsured for the purpose of their own accounts, or where there is a specific remittance for a loss settlement at the rates of exchange used in making such remittance.

## ARTICLE 13

### PREMIUM CLAUSE

The premium payable to Reinsurers shall be at a rate of {RATE} % of the Gross Net Retained Premium Income accounted for by the Reinsured during the period hereof, on Interest as covered hereby, subject to a Minimum and Deposit Premium of {AMOUNT} payable in two equal instalments of {AMOUNT} due on {DATES}.

As soon as practicable after the {EXPIRY DATE} the Reinsured shall submit a statement of their actual Gross Net Retained Premium Income, whereupon the premium paid for this Reinsurance shall be adjusted accordingly. Should the premium so computed be more than the Minimum and Deposit Premium stipulated above, the Reinsured undertake to pay the difference but should it be less there will be no return of premium to the Reinsured.

The term "Gross Net Retained Premium Income" shall mean the Gross Premiums less return premiums, and premiums in respect of reinsurances, recoveries under which inure to the benefit of this Reinsurance, in respect of the Reinsured's net retention on Interest covered hereby.

#### ARTICLE 14

##### REINSTATEMENT CLAUSE

Reinsurers agree that in the event of the whole or any portion of the liability hereunder being exhausted by loss, the amount so exhausted shall be automatically reinstated from the time of occurrence of such loss provided always that Reinsurers' liability hereon shall not exceed {LIMIT} any one loss nor more than {LIMIT PLUS ALL REINSTATEMENTS} in all during the period of this Reinsurance, that is to say {NUMBER} full reinstatement(s).

In consideration thereof, the Reinsured shall pay an additional premium computed at 100% of the final premium hereunder for a full loss or pro-rata for a lesser amount reinstated and shall be paid when losses hereunder are settled. If a loss settlement is made prior to the rendering of the Reinsured's statement of Premium Income in accordance with Article 13 hereof, the Reinstatement Premium shall be provisionally computed on the Deposit Premium for this Reinsurance.

#### ARTICLE 15

##### AMENDMENTS AND ALTERATIONS CLAUSE

It is hereby understood and agreed that any amendments and/or alterations to this Reinsurance that are mutually agreed either by correspondence and/or Brokers' Slip Endorsements shall be automatically binding hereon and shall be considered as forming an integral part hereof.

#### ARTICLE 16

##### INSPECTION

The Reinsurers may at any time during normal office hours inspect and take copies of the Reinsured's records and documents which

relate to business covered under this Reinsurance. It is agreed that the Reinsurers' right of inspection shall continue as long as either party has a claim against the other arising out of this Reinsurance.

## ARTICLE 17

### TERMINATION CLAUSE

Either party shall have the right to terminate this Reinsurance immediately by giving the other party notice:

- (a) if the performance of the whole or any part of this Reinsurance be prohibited or rendered impossible de jure or de facto in particular and without prejudice to the generality of the preceding words in consequence of any law or regulation which is or shall be in force in any country or territory or if any law or regulation shall prevent directly or indirectly the remittance of any or all or any part of the balance of payments due to or from either party;
- (b) if the other party has become insolvent or unable to pay its debts or has lost the whole or any part of its paid up capital;
- (c) if there is any material change in the ownership or control of the other party;
- (d) if the country or territory in which the other party resides or has its head office or is incorporated shall be involved in armed hostilities with any other country whether war be declared or not or is partly or wholly occupied by another power;
- (e) if the other party shall have failed to comply with any of the terms and conditions of this Reinsurance.

All notices of termination in accordance with any of the provisions of this paragraph shall be by telex or telegram and shall be deemed to be served upon despatch or where communications between the parties are interrupted upon attempted despatch.

All notices of termination served in accordance with any of the provisions of this Article shall be addressed to the party concerned at

its head office or at any other address previously designated by that party.

In the event of this Reinsurance being terminated at any date other than that stated in Article 1 then the premium due to the Reinsurers shall be calculated upon the premium income of the Reinsured up to the date of termination or pro rata temporis of the annual minimum premium whichever is the greater. The rights and obligations of both parties to this Reinsurance shall remain in full force until the effective date of termination.

## ARTICLE 18

### INTERMEDIARIES CLAUSE

{NAME AND ADDRESS OF BROKER} are recognised as the Broker for this Reinsurance, through whom all communications and payments relating thereto shall be transmitted to both parties.

## ARTICLE 19

### ARBITRATION CLAUSE

All matters in difference between the parties in relation to the contract to which this agreement is attached, including formation and validity, and whether arising during or after the period of that contract, shall be referred to an arbitration tribunal in the manner hereinafter set out.

Unless the parties agree upon a single arbitrator within thirty days of one receiving a written request from the other for arbitration, the claimant (the party requesting arbitration) shall appoint his arbitrator and give written notice thereof to the respondent. Within thirty days of receiving such notice the respondent shall appoint his arbitrator and give written notice thereof to the claimant, failing which the claimant may apply to the appointor hereinafter named to nominate an arbitrator on behalf of the respondent.

Before they enter upon a reference the two arbitrators shall appoint a third arbitrator. Should they fail to appoint such a third arbitrator within thirty days of the appointment of the respondent's arbitrator then either of them or either of the parties may apply to the appointor

for the appointment of the third arbitrator. The three arbitrators shall decide by majority. If no majority can be reached the verdict of the third arbitrator shall prevail. He shall also act as Chairman of the Tribunal.

Unless the parties otherwise agree the arbitration tribunal shall consist of persons with not less than ten years' experience of insurance or reinsurance.

The arbitration tribunal shall have power to fix all procedural rules for the holding of the arbitration including discretionary power to make orders as to any matters which it may consider proper in the circumstances of the case with regard to pleadings, discovery, inspection of the documents, examination of witnesses and any other matter whatsoever relating to the conduct of the arbitration and may receive and act upon such evidence whether oral or written strictly admissible or not as it shall in its discretion think fit.

The appointor shall be the {TITLE OF APPOINTOR, eg The Chairman for the time being of ARIAS} {ARIAS = AIDA Reinsurance and Insurance Arbitration Society} {AIDA = Association Internationale de Droit des Assurances}.

All costs of the arbitration shall be at the discretion of the arbitration tribunal who may direct to any by whom and in what manner they shall be paid.

The seat of the arbitration shall be in {CITY} and the arbitration tribunal shall apply the laws of {COUNTRY} as the proper law of this agreement and of the contract to which this agreement is attached.

The award of the arbitration tribunal shall be in writing and binding upon the parties who covenant to carry out the same. If either of the parties should fail to carry out any award the other may apply for its enforcement to a court of competent jurisdiction in any territory in which the party in default is domiciled or has assets or carries on business.

Signed in {CITY}, this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

For and on behalf of: The Reinsured

and

For and on behalf of: The Reinsurers as per the individual Signing Schedules attached.

The subscribing Reinsurers' obligations under contracts of reinsurance to which they subscribe are several and not joint and are limited solely to the extent of their individual subscriptions. The subscribing Reinsurers are not responsible for the subscription of any co-subscribing Reinsurer who for any reason does not satisfy all or part of its obligations.



# Appendix 6

## Example Spreadsheet for designing a Proportional Treaty Programme

I am assuming you have a compatible version of Microsoft Excel, which allows the use of VBA macros.

Before we begin on the spreadsheet, we need to write our functions. These will be used to calculate factors to allocate aggregates, premiums and losses over the retention and surplus treaties. Click on Tools, Macro, Visual Basic Editor (or simply press the Alt and F11 keys simultaneously). This will take you into the Visual Basic Editor. Click on Insert, Module. A window will open, ready for you to type your code. Make sure you are coding in a module and nothing else or the functions will not work.

Type:

```
Function FirstLineFactor(MaxLine, MinTSI, MaxTSI)  
  
If MaxLine >= (MinTSI + MaxTSI) / 2 Then  
  
FirstLineFactor = 1  
  
Else: FirstLineFactor = MaxLine / ((MinTSI +  
MaxTSI) / 2)  
  
End If  
  
End Function  
  
Function FirstSurpFactor(FirstLineFactor,  
FirstSurpLines)  
  
If FirstLineFactor = 1 Then  
  
FirstSurpFactor = 0  
  
ElseIf FirstLineFactor * (FirstSurpLines + 1) > 1  
Then  
  
FirstSurpFactor = 1 - FirstLineFactor  
  
Else: FirstSurpFactor = FirstLineFactor *  
FirstSurpLines  
  
End If  
  
End Function
```

```
Function SecondSurpFactor(FirstLineFactor, FirstSurpFactor,_ FirstSurpLines,
SecondSurpLines)

If FirstLineFactor + FirstSurpFactor = 1 Then
    SecondSurpFactor = 0
ElseIf FirstLineFactor * (FirstSurpLines +
SecondSurpLines + 1) > 1 Then
    SecondSurpFactor = 1 - FirstLineFactor -
FirstSurpFactor
Else: SecondSurpFactor = FirstLineFactor *
SecondSurpLines

End If

End Function

Function ThirdSurpFactor(FirstLineFactor, FirstSurpFactor,_ FirstSurpLines,
SecondSurpFactor, SecondSurpLines,_
ThirdSurpLines)

If FirstLineFactor + FirstSurpFactor +
SecondSurpFactor >= 1_ Then
    ThirdSurpFactor = 0
ElseIf FirstLineFactor * (FirstSurpLines +
SecondSurpLines +_ ThirdSurpLines + 1) > 1 Then
    ThirdSurpFactor = 1 - SecondSurpFactor -
FirstSurpFactor -_ FirstLineFactor
Else: ThirdSurpFactor = FirstLineFactor *
ThirdSurpLines

End If

End Function
```

Note that the underscore character ‘\_’ should not be typed, it only indicates that you should carry on typing on the same line. You will

notice that after you type the first line of code, beginning with the word ‘Function’ the editor automatically adds the line ‘End Function’ for you. This is a sign that you are doing something right!

Before we go on to use our functions within a spreadsheet, take a moment to study the code. It is not quite the same as a spreadsheet formula, although it does use the same ‘Boolean’ logic.

Look at the code for the function FirstLineFactor. In the first line, we define the function’s name and give it some arguments (MaxLine, MinTSI and MaxTSI). The names do not matter, but it helps if they are meaningful.

On the next line, we set the first condition, using the ‘If’ keyword. If the maximum line is higher than the midpoint of the sum insured range, ‘Then’ (a keyword, implying do the action on the next line) the factor is 1. This means that all of the aggregates, premiums and losses within that range of sums insured will go to the Gross Line.

The next line contains the ‘Else’ keyword, meaning that if the first statement is not true, do the thing on the next line, which is divide the maximum line by the midpoint of the sum insured range.

Now, in order to use this function in our spreadsheet, we simply need to call it and tell it where to find MaxLine, MinTSI and MaxTSI.

Go back to your empty spreadsheet by clicking on its button in your Windows start bar.

Type the following programme details, starting with the ‘Gross Line’ heading in cell A4. The figure of 500,000 goes into cell B4 and so on. This will give us the basic programme structure. The gross line should be formatted to zero decimal places and a comma to separate the thousands. The retention and quota share (QS) figures are in percentage format.

		Commission
Gross Line	500,000	
Retention	75%	
QS	25%	45.0%
1 <sup>st</sup> Surp Lines	10	42.5%
2 <sup>nd</sup> Surp Lines	10	37.5%
3 <sup>rd</sup> Surp Lines	10	32.5%
Facultative		27.5%

The commission figures commence at cell C6.

Type the following data into your sheet, starting the headings at cell A13 and the first line of data in row 15.

MINIMUM S/I	MAXIMUM S/I	No. of Risks	Aggregate S/I	PREMIUM LOSSES
0	100,000	500	25,000,000	39,252    41,250
100,001	200,000	381	56,350,251	102,870    92,480
200,001	300,000	221	53,168,324	68,524    59,389
300,001	500,000	141	54,289,132	63,450    51,250
500,001	750,000	98	67,543,200	86,724    43,267
750,001	1,000,000	78	64,254,678	67,894    36,589
1,000,001	2,000,000	63	92,345,876	104,987    74,567
2,000,001	3,000,000	24	62,347,865	65,476    36,890
3,000,001	5,000,000	12	49,785,765	51,378    24,321
5,000,001	10,000,000	4	34,567,432	36,578    0
10,000,001	20,000,000	3	48,097,865	49,876    0

Now, we can start using our functions. In cell G15, type

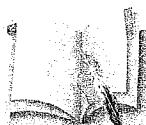
=FirstLineFactor(\$B\$4,A15,B15)

We have called our first function and supplied the required criteria.

Copy the formula down as far as cell G25. Note the dollar signs attached to cell B4. This makes the cell reference absolute, so that it does not change when the formula is copied down or across.

If we had not written our own functions, we could have achieved the same result by typing the following spreadsheet formula:

=IF(\$B\$4>=Average(A15:B15),1,\$B\$4/Average(A15:B15))



This would work perfectly well, but I prefer to use functions for several reasons. First, the formulae for calculating the first, second and third surplus factors become progressively more complex, giving a huge potential for errors. Second, the functions are much easier to understand and third, you can build a library of your favourite functions and import them into any spreadsheet. Spreadsheet formulae are not so easily portable, because they rely on all of the dependent cells having the same addresses as they had in the original spreadsheet in which the formulae were created.

Now we want to use these factors to allocate the aggregates, premiums and losses to the first line of retention. Select cell H15 and type

=D15\*\$G15

We are multiplying the 100% aggregates by the factor, to get the amount of aggregate to the first gross line. The formula can be copied down and across as far as cell J25. This will allocate the aggregates, premiums and losses to the first gross line. Note the dollar sign in front of the G. This prevents the formula from changing the G to H and I when copying across, but allows the row numbers to increment by one, each time the formula is copied down a row.



Our spreadsheet is well on its way now. Remember to save it regularly, so that you do not lose your work if your computer crashes.

We are aiming for a spreadsheet that looks like the one in the illustration.

The next step is to calculate the shares to the First Surplus treaty. Again, we do this by applying a factor to each band of the profile, using the second of our predefined functions, 'FirstSurpFactor'.

In cell K13 type the heading '1<sup>st</sup> Surp Factor'.

In cell K15 type the formula:

=FirstSurpFactor(G15,\$B\$7)

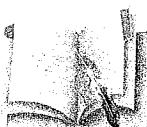
Once again, we are calling a procedure and giving it two criteria or arguments to work with. Do not worry if you forget which arguments to use or the order to put them. Help is at hand should you need it. Notice that to the left of the box where you type your formulae there is an equals sign (=). If you want help with a formula, click on this and you will be asked to choose a function from a list. By default, the word 'SUM' appears, with a downward pointing arrow to its right. Click on this arrow and you will be presented with a list of functions. Click on 'More functions...' and you will be presented with a dialog box. Under 'Function category' select 'User defined' and then choose the required function (FirstSurpFactor). On clicking the

'OK' button, you will be presented with another dialog box, showing the arguments required by the chosen function. Life is made still easier. To the right of each function there is an icon. Click on it and the dialog box will close temporarily, while you locate the cell in the spreadsheet where the data for the first argument resides. In this case, the first argument, FirstLineFactor, is in cell G15. Select this cell and press the Enter key on your keyboard. The dialog box will re-open with cell G15 filled in at the appropriate place. Click on the icon next to the second argument, FirstSurpLines, the go to cell B7 and press the Enter key. This time you need to 'freeze' this argument within the formula so that it does not increment whenever the cell is copied down or across. The shortcut to achieving this is to press the F4 key. Click on the 'OK' button and the formula is complete.

Copy this down to cell K25. This factor may then be applied to the aggregates, premiums and losses, in the same way as for the first gross line. Type the following into cell L15:

=D15\*\$K15

Again, copy down and across as far as cell N25 and type some meaningful headings into cells L13 to N13.



**The allocations for the Second Surplus and Third Surplus treaties follow much the same procedure.**

The formula for calculating the Second Surplus factor, starting at cell O15 is:

=SecondSurpFactor(G15,K15,\$B\$7,\$B\$8)

Copy this as far as cell O25. At P15 type:

=D15\*\$O15

Copy this down and across to R25.

At S15 type the following:

=ThirdSurpFactor(G15,K15,\$B\$7,O15,\$B\$8,\$B\$9)

Copy it down to S25 and then type the following at T15:

=D15\*\$S15

Copy this down and across to V25.

This is how the next portion of the spreadsheet should look.

Microsoft Excel - TreatyDesigner											
	File			Edit			View			Insert	
	Format			Tools			Data			Accounting	
	Arial	10	B	C	D	E	F	G	H	I	J
O15			=	SecondSurpFactor(G15,K15,\$B\$7,\$B\$8)							
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15	1st Surp Factor	First Surplus			2nd Surp Factor	Second Surplus			3rd Surp Factor	Third Surplus	
16		Aggregate	Premium	Losses		Aggregate	Premium	Losses		Aggregate	P
17	0.000000	-	-	-	0.000000	-	-	-	0.000000	-	0
18	0.000000	-	-	-	0.000000	-	-	-	0.000000	-	0
19	0.200001	13,504,683	17,345	8,663	0.000000	-	-	-	0.000000	-	0
20	0.428572	27,537,740	28,097	15,681	0.000000	-	-	-	0.000000	-	0
21	0.666667	61,563,928	69,991	47,711	0.000000	-	-	-	0.000000	-	0
22	0.800000	49,878,234	52,301	23,512	0.000000	-	-	-	0.000000	-	0
23	0.875000	43,582,545	44,966	21,281	0.000000	-	-	-	0.000000	-	0
24	0.696667	23,049,953	24,386	-	0.268667	9,217,984	9,754	-	0.000000	14,423,361	14,363
25	0.333333	16,032,621	15,625	-	0.333333	16,032,621	15,625	-	0.300000		0
26											
27											
28											
29											
30											

The final part of the allocation process is to allocate the “leftovers” to the facultative account.

Type the following formula in cell X15:

=D15-H15-L15-P15-T15

Copy this down and across as far as cell Z25. This is a simple subtraction formula. D15 holds the gross aggregates for the first band of the profile. We subtract the aggregate amounts that were allocated to the first gross line and first, second and third surplus treaties. Anything that does not fit into the proposed treaty programme is, by definition, going to be placed facultatively.

With all of the amounts in the profile correctly allocated to our proposed treaty structure, we can now take a look at the results of the various treaties and the net retention.

The total aggregates for the First Gross Line will need to be further allocated between the retention and the Quota Share treaty (if there is one). The retained share goes into cell D5 and has the formula:

=SUM(H\$15:H\$25)\*\$B5

B5 is the cell where we have put the percentage retention. Note that there is a dollar sign just before the B. This fixes the column, but not the row, when the formula is copied. Similarly, the dollar signs before the row numbers of the other cells means that they will stay at 15 when we copy the formula down. We can copy this formula down by one row and across by two columns. This has allocated the aggregates, premiums and losses of the first gross line across the retention and quota share treaties.

The total aggregates for the three surplus treaties and the facultative account require the following formulae in cells D7 to D10 respectively:

=SUM(L15:L25)  
 =SUM(P15:P25)  
 =SUM(T15:T25)  
 =SUM(X15:X25)

All of these should be copied across to the next two columns.

The commission calculation is simple. On each of the treaties, as well as on the facultative account, we need to multiply the premium by the commission rate. Starting at cell G6, type the formula =E6\*C6 and copy it down to cell G10.

The retained account does not attract any commission of course. However, the retained account does benefit from the commission earnings on all reinsurance placements. Therefore, the formula for the commission item of the retained account (cell G5) is =SUM(G6:G10).

Finally, we need to calculate the final result of the net (retained) account and each treaty. Into cell H5 type the following formula:

=E5-F5+G5

Into cell H6 type:

=E6-F6-G6

Copy it down as far as H9 (there is no point in calculating the facultative result, because the facultative placements will probably be placed in a variety of different markets).

The spreadsheet is finished, and shows that the net account, based on the proposed treaty structure, would make a profit of 251,928 while the treaty reinsurers are somewhat worse off! Still, that is always to be expected, since the reinsurance commission earnings are considerable, while no account has been taken in our calculations of the costs the original insurer has incurred at the 'front end'.



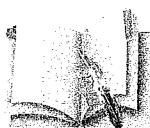
**Of course, the design of this spreadsheet is highly simplistic. It makes no allowance for a graded table of retentions. It does not differentiate between risks located in different catastrophe zones, nor allow for the inconsistencies of the Reinsurance Manager in deciding how to cede a particular risk to treaties.**

These shortcomings can of course be overcome if we construct a more complex spreadsheet, with several pages of profiles for different types of risk and a separate retention for each.

# Appendix 7

## Sample Burning Cost Spreadsheet Model

### Burning Cost Spreadsheet Model



The best way to describe how a burning cost rated contract operates is through a spreadsheet model.

We are going to build a simple spreadsheet to help us to look at the financial consequences of a contract that is rated on this basis. All we are really looking at is the difference between the amount of losses that the reinsured can recover and the premium he must pay for the contract. We are then going to compare this with the financial consequences of arranging the same cover, but with an inner aggregate deductible and a fixed premium rate.

Start Microsoft Excel with a new workbook.

The first step is to put in some basic information. The GNPI is the premium income base that the contract is to be rated on. The heading goes into cell A4 and the figure into B4.

The Factor is the burning cost loading that appears in cell B5. The figure I have typed into the cell is =100/70 but because the cell is formatted to two decimal places, the result has been calculated as shown. The minimum and maximum rates are shown in cells B6 and B7, while the minimum and deposit premium for the contract is in B8. The 'to earn' figures in C6 and C7 are just there for information and show what the contract would earn at the minimum and maximum rates, based on the estimated GNPI. These can be calculated using the formulae =B\$4\*B6 and =B\$4\*B7 respectively. You may need to format these cells to show a comma and no decimal places.

	A	B	C
4	GNPI	750,000	
5	Factor	142.86%	To Earn:
6	Min Rate	1.00%	7,500
7	Max Rate	4.50%	33,750
8	MinDep	7,500	

Next, we put some hypothetical loss figures in cells A11 to A21 or as far as you want to go. Note that these are losses to the layer, after the reinsured's priority has been deducted from each claim.

The Premium column requires some calculation. The first cell to receive the formula is B11, and the formula reads as follows:

=IF(A11\*\$B\$5<\$B\$8,\$B\$8,IF(A11\*\$B\$5>\$B\$4\*\$B\$7,\$B\$4\*\$B\$7,A11\*\$B\$5))

This means if the losses times the factor are less than the minimum and deposit premium, put the minimum and deposit premium. Failing that, if the losses times the factor are greater than the maximum rate applied to the GNPI, put the maximum rate applied to the GNPI. If both of these tests fail, the losses multiplied by the factor must produce a premium that is somewhere between the minimum and the maximum rate applied to the GNPI, so calculate that. This formula can be copied into cells B12 downwards, as far as you like. Note that any reference to the figures for GNPI, factor, minimum rate, minimum rate or minimum and deposit premium contain dollar signs around the cell address, so that they keep the same address whenever the formula is copied into another cell.

Column C contains a simple formula to calculate the balance of the contract, taking the contract losses payable by reinsurers away from the premium payable by the reinsured. In cell C11 we simply need =B11-A11 and copy the formula down.

	A	B	C
10	Losses to Layer	Premium	Balance
11	0	7,500	7,500
12	7,500	10,714	3,214
13	8,000	11,429	3,429
14	9,000	12,857	3,857
15	10,000	14,286	4,286
16	15,000	21,429	6,429
17	20,000	28,571	8,571
18	25,000	33,750	8,750
19	30,000	33,750	3,750
20	35,000	33,750	(1,250)
21	40,000	33,750	(6,250)

Now we are going to try an alternative basis of rating using an inner aggregate deductible and a fixed premium rate. 'IAD' stands for inner aggregate deductible. The heading is in cell E6 and the figure itself is in F6. The figure for the rate is in F7 and is formatted to two decimal places. This means that if you type in 0.0075 you will see 0.75%. The minimum and deposit premium figure appears in cell F8. Finally, in G8 we have an earned premium figure to calculate the premium should the rate applied to the GNPI produce less than the minimum and deposit premium. The formula for this cell is =IF(B4\*F7<F8,F8,B4\*F7)

In other words, if the rate times the GNPI is less than the M&D, put the M&D. Otherwise, multiply the GNPI by the rate.

	E	F	G
4		Alternative Basis	
5			
6	IAD	28,125	
7	Rate	0.75%	To Earn:
8	MinDep	5,000	5,625

In cell E11 we calculate the recoverable losses to the contract, net of the inner aggregate deductible. We use the formula  
 $=IF(A11<$F$6,0,A11-$F$6)$  In other words, if the amount of losses otherwise recoverable under the contract are less than the inner aggregate deductible, the contract pays nothing. If they are greater, the contract pays the losses otherwise recoverable, minus the inner aggregate deductible.

The balance figures, from cell F11 downwards, represent the premium (cell G8) less the losses recoverable after deduction of the IAD, according to the formula =G\$8-E11

Finally, the column headed 'Advantage' represents the difference in balance between the burning cost basis and the IAD basis, ie =C11-F11 and so on.

	E	F	G
10	Recoverable	Balance	Advantage
11	0	5,625	1,875 <sup>1</sup>
12	0	5,625	(2,411)
13	0	5,625	(2,196)
14	0	5,625	(1,768)

15	0	5,625	(1,339)
16	0	5,625	804
17	0	5,625	2,946
18	0	5,625	3,125
19	1,875	3,750	0
20	6,875	(1,250)	0
21	11,875	(6,250)	0

<sup>1</sup>Formula: =C11-F11

Having built the spreadsheet, you can play around with the figures to find an acceptable alternative to the burning cost. A very useful tool is the 'Goal Seek' under the 'Tools' menu. For example, you may wish to convince the reinsurers that they would be no worse off on this new basis when the losses are very high. To keep the reinsurers' deficit the same on either basis at a particular level of losses, you can instruct the goal seeker to make cell G21 equal zero, by changing the IAD (cell F6). This is how the figure of 28,125 was in fact arrived at.

If you change the IAD to \$20,000 and use the goal seeker to make cell F21 equal to -6,250 by changing the Rate (cell F7), this produces a rate of 1.83%. This would be very unattractive to the reinsured because, not only would he be paying a higher premium at the beginning of the year, he would not make any loss recoveries in respect of the first 20,000 of incurred losses to the layer.



**It is clear that some judgement must be used when using this model, because not every solution will be attractive. However, it is a useful tool that you can adjust to suit your own needs.**

## Appendix 8

# Constructing a Property Risk XL Rating Model

This model has three pages, which I have labelled ‘Profile’, ‘Programme’ and ‘Scale’.

Starting with the ‘Profile’, this page contains most of the basic calculations. You can label it by double clicking on the tab, or leave it as its default, ‘Sheet 1’. The sum insured ranges can start at cell A14 and go down to B33, giving us 20 ranges. For example, A14 would have a cell value of 0 and cell B14 might have 1,000 representing the upper value of that range. How you divide the ranges depends upon the largest value in the profile and the proposed layering of the excess of loss programme. There is no point in having too many divisions at levels below the first layer priority because none of these risks will expose the cover. However, if the divisions are too wide it may not give an accurate view of the exposures into consecutive layers of the programme.

Column C will accept the total premium in each band of values. Column D simply calculates the midpoint of the value range, hence cell D14 will have the formula =(A14+B14)/2 which is copied down as far as cell D33. The result of this calculation will be used in the calculation of other cells’ values.

### Profile

	A	B	C	D
13	Minimum S/I	Maximum S/I	Gross Premiums	Midpoint
14	0	1,000	5,678	500
15	1,000	3,000	5,436	2,000
16	3,000	5,000	6,775	4,000
17	5,000	10,000	34,556	7,500
18	10,000	20,000	23,456	15,000
19	20,000	30,000	434,567	25,000
20	30,000	40,000	33,456	35,000
21	40,000	50,000	235,567	45,000
22	50,000	60,000	356,676	55,000
23	60,000	70,000	23,445	65,000
24	70,000	80,000	1,367	75,000

25	80,000	90,000	0	85,000
26	90,000	100,000	439	95,000
27	100,000	110,000	244	105,000
28	110,000	120,000	282	115,000
29	120,000	130,000	2,159	125,000
30	130,000	140,000	1,592	135,000
31	140,000	150,000	0	145,000
32	150,000	160,000	171	155,000
33	160,000	200,000	13,398	180,000

Column E calculates the exposure to the layer but, before we can calculate it, we need to know the limit and priority of the proposed cover. We shall put the limit in cell F10 and the priority in F11. The labels can go into cells E10 and E11.

### Profile

	E	F
8		First Layer Calculations
9		
10	Cover	75,000
11	Deductible	25,000

Having entered some values for the limit and priority, we can now calculate how much each risk in a band exposes the cover. The formula would be:

=IF(\$D14<=F\$11,0,IF(\$D14>=F\$11+F\$10,F\$10,\$D14-F\$11)

which means that, if the midpoint of the range is less than or equal to the priority of the cover, there is no exposure to the cover. Failing this, if the midpoint is greater than or equal to the sum of the limit and the priority, the cover limit is totally exposed; in other words, the exposure to the layer is equal to the monetary limit of the layer. Failing this, the midpoint is greater than the priority, and within the limit, so subtract the priority from the midpoint value of the range.

Alternatively, we can write another user-defined function in Excel. Press keys Alt and F11 simultaneously to open the Visual Basic Editor. Click the menu item 'Insert' and then click on 'Module'. Type in the following lines of code:

Function Exposure(MidPoint, Priority, Limit)

```

Select Case MidPoint
Case Is <= Priority
Exposure = 0
Case Is >= (Priority + Limit)
Exposure = Limit
Case Else
Exposure = MidPoint - Priority
End Select

End Function

```

This function looks for the value of the midpoint of the layer. If it is less than the priority, the exposure is nil. If it is higher than the total of the priority and the cover limit, the entire cover limit is exposed. In all other cases, the exposure is equivalent to the midpoint less the priority. This may seem complicated compared with entering the previous formula, but it will save time later as it can be re-used.

Assuming that the priority is in cell F11 and the limit is in cell F10, the formula you would place in cell E14 is =exposure(\$D14,F\$11,F\$10)



**Note the dollar signs before the row numbers of the priority and limit cells. This prevents the numbers from being incremented when the formula is copied down. Do not put dollar signs before the column letters, as we wish to copy the formula across for other layers at a later stage.**

Conversely, cell D14 contains a value that needs to be incremented when the formula is copied down, but must not be incremented when the formula is copied across because the midpoint will always be in the same column.

This formula can be copied down as far as E33 to give the following results:

#### Profile

	E
13	Exposure to Layer
14	0
15	0
16	0

17	0
18	0
19	0
20	10,000
21	20,000
22	30,000
23	40,000
24	50,000
25	60,000
26	70,000
27	75,000
28	75,000
29	75,000
30	75,000
31	75,000
32	75,000
33	75,000

Column F expresses the values calculated in column E as percentages of the midpoint values in column D. We could use the simple formula =E14/\$D14\*100 and so on, down to cell F33. However, this can sometimes cause error values to appear, which creates problems throughout the spreadsheet. We therefore use the following:

```
=IF($D14<=F$11,0,IF($D14>F$10+F$11,F$10/$D14*100,($D14-F$11)/$D14*100))
```

This means: If the midpoint is less than or equal to the priority, the percentage exposure is nil. If the midpoint is greater than the limit plus the priority, put the limit over the midpoint, as a percentage value. Failing both of these tests, the midpoint must have a value that exposes the layer, but not totally, so subtract the value of the priority from the value of the midpoint and express the result as a percentage of the midpoint.

Again, we can simplify this by using a tailor-made function. Return to the Visual Basic module that we wrote previously. Make sure that the cursor is after the words "End Function" and hit the return key a few times. Then type in the following code:

Function ExpPct(MidPoint, Priority, Limit)

Select Case MidPoint

Case Is <= Priority

ExpPct = 0

Case Is >= (Priority + Limit)

ExpPct = (Limit / MidPoint) \* 100

Case Else

ExpPct = ((MidPoint - Priority) / MidPoint) \* 100

End Select

End Function

We can now type a much simpler formula into cell F14 as follows:

=ExpPct(\$D14,F\$11,F\$10)

Again, copy this formula down to row 33.

In column G we are calculating the value of the priority as a percentage of the midpoint. For any midpoint value which is below the priority, we can say that the priority represents 100% of the midpoint value (to have a figure greater than 100% would be ridiculous, and would spoil the calculations). The formula for cell G14 is =IF(F\$10>\$D14,100,F\$10/\$D14\*100) which means that, if the priority is greater than the midpoint, there is no exposure, so put 100 (meaning 100%). Otherwise put the value of the priority divided by the midpoint, times 100.

Alternatively, type another function in the Visual Basic module, as follows:

Function PriorityPct(Midpoint, Priority)

Select Case Midpoint

Case Is <= Priority

PriorityPct = 100

Case Else

PriorityPct = (Priority / Midpoint) \* 100

End Select

End Function

We can then type the following formula in cell G14:

=PriorityPct(\$D14,F\$11)

After copying this formula as far as row 33, we get the following results:

### Profile

	F	G
13	Exposure as % of midpoint	Priority as % of midpoint
14	0	100
15	0	100
16	0	100
17	0	100
18	0	100
19	0	100
20	28.57	71.43
21	44.44	55.56
22	54.55	45.45
23	61.54	38.46
24	66.67	33.33
25	70.59	29.41
26	73.68	26.32
27	71.43	23.81
28	65.22	21.74
29	60	20
30	55.56	18.52
31	51.72	17.24
32	48.39	16.13
33	41.67	13.89

Column H calculates a rating factor, by referring to a first loss scale. To do this, we must first enter a first loss rating scale. The scale you use can be derived from whatever source you choose. I have used a Lloyd's scale that has been in existence since about 1972, and which you will find reproduced in Appendix 4. I have only used whole numbers for the percentage of original values, even though the Lloyd's scale provides some fractional percentages. Double click on the tab called 'Sheet2' and rename it 'Scale'. I have entered the first loss amount in column A starting at cell A10 with a figure of 1

and going down to cell A109 in 1% increments to end on 100%. In column B we show the relevant scale rate, starting with 22.4 in cell B10. This means that, if a first loss policy were to be issued covering 1% of the total value at risk, the premium to be charged would be 22.4% of the premium for a full value policy. The next stage is to highlight the figures in cells A10 to B109 (by holding the mouse button down and dragging over them) and to name the range, by clicking on the 'A10' label to the left of the formula bar and then typing in a suitable name. By force of habit, I have named this range 'Data'.

Going back to our profile sheet, we can now write the formula for cell H14. The formula is a little more complex, because it relies on a lookup routine. First, here is the formula  
 $=VLOOKUP((F14+G14),Data,2)-VLOOKUP(G14,Data,2)$  This is saying 'Add the limit and priority percentages in cells F14 and G14 and look up the nearest number to it in the Scale sheet, under column A. Then, read off the value one place to the right (the ',2' after 'Data' means 'find the second column to the right'). Next, look up the value nearest to the priority percentage in cell G14, and take the value one place to the right. Subtract the second figure from the first figure to give the answer. Let us assume that the priority represents 20% of the midpoint value, and the exposure to the layer represents 30%. Together they account for the first 50% of the value at risk, which requires 83% of the original premium. The priority represents the first 20% of the risk, requiring a premium of 65.5% of the risk. Therefore 30% excess of 20% requires a premium of 17.5% of the original premium.

Column I calculates how much of the original premium should go to our proposed excess of loss cover. The formula for cell I14 is  
 $=$C14*H14/100$ , in other words the original premium for the band, times the rating factor for the exposure to the layer, divided by 100 (because the factor was multiplied by 100 to make it a percentage).

## Profile

	H	I
	Rate Factor	Exposure Premium
13		
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	12.4	4,149
21	16.1	37,926
22	18.9	67,412
23	21.2	4,970
24	23	314
25	25.9	0
26	28	123
27	28.8	70
28	27	76
29	25.3	546
30	25.1	400
31	24.9	0
32	25.1	43
33	26.5	3,550

The figure we are looking to derive is the total premium due to the layer, in other words, the total from column I. I have put this figure in cell I38 with the simple formula =SUM(I14..I33)

Finally for this sheet, we can calculate the so-called 'unlimited rate on line' in cell I9, which is just the total premium from cell I38 expressed as a percentage of the limit, hence =I38/F10 This does not need to be multiplied by 100 as the Poisson formula uses decimal formatting, rather than percentages. Using the specimen figures, cell I9 is showing a figure of 1.59, representing 159%.

So far, we have put data into columns A, B and C. We have put calculations into columns D to I inclusive. For the sake of clarity, we are going to leave column J blank. We can make it narrower, and we can put a box around all of the calculations we have done so far. If we want to perform calculations for a further layer, we can simply copy

everything from E9 down to I38 into a new block of cells starting at K9. Now, if we change the figures for the limit and deductible at cells L9 and L10 to reflect the terms of the second layer of the programme, the spreadsheet should do the rest.

In the final sheet, headed 'Programme', we will see how the calculated "Unlimited Rate on Line" should be adjusted to take account of the reinstatement terms of the contract.

Place a heading 'Subject GNPI' in cell A4, with the figure appearing in B4. Most contracts are rated on the GNPI of the protected account, even though the preliminary rating calculations use 'rate on line'. The contract limit and priority should appear in B8 and B9, with their headings in A8 and A9.

### Programme

	A	B	C	D
4	Subject GNPI	43,000		
5			First Layer Rating Calculations	
6				Limited Free
ROL				
7				Reinst Cost
8	Limit	75,000		Contract ROL
9	Deductible	25,000		Rate on Income
10				To Earn
11	No. of Reinstatements	1		
12	Reinst. # 1 Cost	1	100%	79.70%
13	Reinst. # 2 Cost	0		0.00%
14	Reinst. # 3 Cost	0		0.00%
15	Reinst. # 4 Cost	0		0.00%
16	Reinst. # 5 Cost	0		0.00%
17	U'Ltd ROL		159.428%	
18	Poisson	0		20.30%
19	Poisson	1		32.37%
20	Poisson	2		25.81%
21	Poisson	3		13.72%
22	Poisson	4		5.47%
23	Poisson	5		1.74%
24	Cover Cost	0	79.70%	
25	Cover Cost	1		47.33%

26	Cover Cost	2	21.52%
27	Cover Cost	3	7.80%
28	Cover Cost	4	2.34%
29	Cover Cost	5	0.59%

Enter the number of reinstatements for the contract in B11 with its heading in A11. In the next five columns, we are going to calculate either a zero or a 1, depending on the number of reinstatements. We can call the headings ‘Reinstatement # 1 Cost’ etc, from cells A12 to A16. In cell B12 we enter this simple formula =IF(B\$11>0,1,0) which we then copy down through to B16, but with one minor change; cell B13 will have the formula =IF(B\$11>1,1,0) Cell B14 will have the first figure in the brackets after B\$11 set to 2 and so on. This is like a “true or false” calculation, so that if the figure for the number of reinstatements is 5 (or greater), cells B12 to B16 will all have a value of 1. If the number of reinstatements is 4, cell B16 will have a value of zero, and so on.

Next comes the actual cost of the reinstatements as a percentage of the contract premium. These will go into cells C12 to C16 and will be entered as decimals. For example, if the cost of the first reinstatement is 100%, enter a 1 in cell C12. Cells C12 to C16 should be formatted as percentages, probably with the number of decimal places set to zero.

Cell A17 contains the heading ‘Unlimited Rate on Line’ and its figure is placed in cell C17. This is a derived figure, and so its formula is =Profile:I9

Now we are going to break the unlimited rate on line into its Poisson components. In cells A18 to A23 we have the simple heading ‘Poisson’ and in B18 to B23 the numbers 0 to 5. In other words, we are calculating the Poisson for the first cover and the first 5 reinstatements (if we wish to calculate a rate for a cover with more than 5 reinstatements, we can easily adapt the spreadsheet).

In cells C18 to C23 we are going to calculate the Poisson for the first cover and subsequent reinstatements. In C18 we have the formula =POISSON(B18,C\$17,FALSE) This should be copied down through to cell C23.

Please refer to the explanation given below in respect of this formula. The Poisson for each successive cover is not the actual rate that should be charged for that cover. We need to calculate the complementary of the cumulative Poisson, and we do this in cells C24 to C29 with the following formulae:

C24: =1-C18

C25: =1-SUM(C18..C19)

C26: =1-SUM(C18..C20)

C27: =1-SUM(C18..C21)

C28: =1-SUM(C18..C22)

C29: =1-SUM(C18..C23)

As I am writing, the figure for the ‘unlimited rate on line’ in cell C17 is showing 159.428%. The corresponding Poisson components in cells C24 to C29 are:

79.69% for the first cover

47.32% for the second cover (ie the first reinstatement)

21.52% for the second reinstatement

7.80% for the third reinstatement

2.34% for the fourth reinstatement

0.59% for the fifth reinstatement.

Also in my sample data I have entered the number of reinstatements as 1 in Cell B11 and the cost of the reinstatement as 1 (100%) in C12.

In cells D12 to D16 we are going to calculate the cost of each reinstatement based upon the Poisson component of the Unlimited Rate on Line. This is simply a question of multiplying the Poisson components in cells C24 to C29 by the cost of the respective reinstatement in C16 to C12. Hence in cell D12 we have the formula =C24\*C12 which we then copy down as far as D16.

In my data the figure currently displayed in D12 is 79.69% being the Poisson value of the first cover, multiplied by 100% which is the price of the first reinstatement.

The final calculations are a little complex, and are summarised below:

	D	E
6	Limited Free ROL	=C24+(C25*B12)+(C26*B13)+(C27*B14)+(C28*B15)+(C29*B16)
7	Reinst Cost	=1+(C24*C12)+(C25*C13)+(C26*C14)+(C27*C15)+(C28*C16)
8	Contract ROL	=E6/E7
9	Rate on Income	=B8*E8/\$B\$4
10	To Earn	=\$B\$4*E9

In Cell E6 we are calculating the sum of the Poisson rates for the first cover, plus any reinstatements. C24 is the first cover, and C25 is the first reinstatement. B12 is either a 1 or a zero, depending upon whether or not there is a reinstatement. In my data there is one reinstatement, so B12 is a 1. Cells B13 to B16 are all set to zero, because there are no subsequent reinstatements. Hence in my data Cell E6 computes to 127.02% being the sum of 79.70% from cell C24 and 47.33% taken from Cell C25.

The reinstatement cost is really an artificial calculation. In our spreadsheet we are concerned with the contract Rate on Line, which is represented by the Limited Free ROL over the Reinstatement Cost (hence the formula in Cell E8 is =E6/E7).

The actual formula for calculating the contract rate on line is:

$$\frac{\text{Total of the Poisson rates for the cover and any reinstatements}}{1 + \text{the total cost of the reinstatements}}$$



Bear in mind that the cost of the first reinstatement is the percentage reinstatement cost applied to the Poisson cost of the first cover, not the reinstatement.

Having calculated the contract rate on line, it is then a simple matter to convert this into a rate based upon the estimated GNPI (Cell E9) and to estimate how much premium, in monetary terms, the contract will generate (Cell E10).

## Programme

	D	E
6	Limited Free ROL	127.02%
7	Reinst Cost	179.70%
8	Contract ROL	70.69%
9	Rate on Income	123.29%
10	To Earn	53,015

For rating subsequent layers, we can simply copy the entire cell range from A5 to E29, leaving a single column gap between the layers. Therefore, the second layer calculations can be pasted into Cell G5, which will ensure that all of the calculations will refer to the correct cells in the spreadsheet.

At the moment, we have a potential for double-keying errors in our spreadsheet. The limit and priority for each layer appear twice, once on the ‘Profile’ sheet and again on the ‘Programme’ sheet. To correct this, open the ‘Profile’ sheet by clicking on its tab. Highlight cell F10. Type ‘=’ (the “equals” sign) and then click on the tab of the ‘Programme’ sheet. Click on cell B8 and then press the return key. There will now be a formula in cell F10 of the ‘Profile’ sheet, as follows:

=Programme!B8

This means that, whenever you enter the first layer limit on the programme sheet, the corresponding cell in the profile sheet will automatically be updated for you. You can repeat this procedure for the priority and for other programme layers.

As a final measure, you can protect the formula cells in your spreadsheet so that only data cells may be altered.

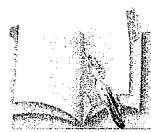


That completes the risk excess of loss rating model. I hope you will find it useful, but I do urge you not to take the results as definitive. I must stress that this is only one way of calculating rates and underwriters may build in many other factors, such as original acquisition costs, adequacy (or otherwise) of original rates, reinsurance brokerage etc, as well as commercial considerations.

## Poisson Formula

The formula for determining the Poisson of the cover and subsequent reinstatements is  $@EXP(-C\$17)*C\$17^B18/@FACT(B18)$ , where cell C17 is the ‘unlimited rate on line’ and cell B18 is either a zero, meaning that it represents the first cover, or a whole number, representing the sequential number of the reinstatement.

This formula first calculates the exponential of the negative of the unlimited rate on line and multiplies it by the unlimited rate on line, raised to the power of the cover (0 for the first cover, 1 for the first reinstatement and so on) over the factorial of the reinstatement.



**This rather complex formula is difficult to understand, and I can only suggest that you read a textbook on advanced statistics. Alternatively, the Help file on the latest editions of Microsoft Excel provides some explanation of the Poisson function.**

In some versions of Microsoft Excel, there is an inbuilt Poisson function, and we could therefore use the formula =POISSON(B18,C17, FALSE).

The formula should be copied down for about six cells to provide space for a decent number of reinstatements.

This will give you a cumulative Poisson, from which we need to extract the individual elements to give us the cost of each successive cover (the first will be the first cover, and subsequent calculations will give us the respective reinstatement costs).

## Appendix 9

# Constructing a Catastrophe Rating Model

Open the file constructed in Appendix '8' and click on 'Insert' and 'Worksheet'. Double click on the new sheet's tab and amend the heading to 'Catastrophe', hitting the return key to store the amendment.

First of all, we will put in some basic data. The headings 'GNPI', 'PML', 'Limit', 'Deductible' and 'Index' can go into cells A2 to A6 with their figures appearing alongside, in the corresponding rows of column B. The figure for 'Index' should be the current index figure, as explained in Section 8.3.

Catastrophe				
	A	B	C	D
1				
2	GNPI	16,000,000		Rating Factor
3	PML	80,000,000	% of PML	11.5
4	Limit	20,000,000		Rate on GNPI
5	Deductible	20,000,000		
6	Index	150		
7		Loss Statistics		
8	Year	Index	Amount	Indexed Amount
9	1990	100	3,000,000	4,500,000
10	1991	115	750,000	978,261
11	1992	120	500,000	625,000
12	1993	130	9,793,333	11,300,000
13	1994	135	0	0
14	1995	150	40,000,000	40,000,000
15				
16				Average
17	Factor			
18	on Loss	40.2		
19	Loss Cost	18,159,204		

In cells A8 to E8 we can put the headings 'Year', 'Index', 'Amount', 'Indexed Amount' and 'As if 90% XS 10%'. The 'Amount' column represents the amount of each individual catastrophe loss. If there were two catastrophe losses in a single year, you would need to enter both figures.

Do not add the catastrophe claims for one year together.

'Indexed Amount', starting in cell D9, has the formula =C9\*\$B\$6/B9 which may then be copied down as far as necessary (I have taken mine down to row 14 for simplicity's sake). The "As if 90% xs 10%" column works out the losses for a fictitious layer of 90% excess of 10% of the largest indexed loss. It contains the formula =IF(D9>\$F\$6,D9-\$F\$6,0)

This means that, if the Indexed Amount is less than 10% of the largest indexed loss, put zero. Otherwise, calculate the indexed loss, less the deductible. The only problem is that cell F6 is blank at the moment, so this calculation will produce the result 'ERR'. To correct this, let us now calculate the cover and deductible of the fictitious 90% excess of 10% layer. In cells E5 and E6 enter the headings "90% Largest Loss" and "10% Largest Loss". The calculations in cells F5 and F6 are =MAX(D9..D14)\*0.9 and =MAX(D9:D14)\*0.1 In other words, find the maximum figure from the range of cells D9 to D14 and multiply it by 90% to arrive at the limit and by 10% to arrive at the deductible.

#### Catastrophe

	D	E	F	G
1				
2	Rating Factor	Premium		
3	11.5	2,088,308		
4	Rate on GNPI	13.05		As%ofPML
5		90% Largest Loss	36,000,000	45
6		10% Largest Loss	4,000,000	5
7				
8	Indexed Amount	As If 90% xs 10%		
9	4,500,000	500,000		
10	978,261	0		
11	625,000	0		
12	11,300,000	7,300,000		
13	0	0		
14	40,000,000	36,000,000		
15	Total	43,800,000		
16	Average	7,300,000		

Now that we have calculated the fictitious cover and deductible, we should express these as percentages of the Catastrophe PML. In cell G5 we can use the formula =F5/\$B\$3\*100 Cell G6 is a little more tricky, because we want to avoid error values that may occur later if the figure for 10% of the largest loss computes to less than 1. We therefore use the formula =IF((F6/\$B\$3\*100)<1,1,F6/\$B\$3\*100) This is because our First Loss Scale does not contain any figures below 1%.

The ‘as if’ losses may now be totalled in cell E15 with the formula =SUM(E9..E14) and an average may be calculated in cell E16 using the formula =E15/COUNT(E9..E14) This is dividing the average as if loss by the number of years.



**Note that, if we have more than one catastrophe loss in any year, you will need to modify this formula; if not, you will end up dividing by the number of losses, which will give a false result.**

The next job is to calculate the factor to be applied to the as if average loss. In our example, we are looking at a fictitious layer for 45% excess of 5% of the PML. As we have already seen, this requires a premium of 40.5% of the Pure Risk Premium. However, we are going to use the ‘VLOOKUP’ function in Excel and this produces a minor anomaly. If we are looking up a figure of 45 in the table and Excel cannot find exactly 45, it will take the next lowest value, rather than the nearest value. Sometimes, the cell whose value you wish to look up may appear to contain a value of 45, but internally Excel may recognise it as 44.9999. This may cause Excel to return the value from the lookup table corresponding to 44, rather than 45. The errors this produces are usually not serious, but it helps to be aware of them because it means that you will sometimes see slightly different results from those you would have arrived at by manual calculation. The calculation of the factor is carried out in cell B18 with the formula =VLOOKUP((G5+G6),DATA,2)-VLOOKUP(G6,DATA,2)

To prove a point, my example of 45% excess of 5% has returned a factor of 40.2 rather than 40.5.

The value from cell B18 is then used to ‘gross up’ the as if losses to a notional 100% value. In other words, we are saying “If a contract for 45% excess of 5% of the current catastrophe PML would have

produced average losses over a given period of \$7,300,000, and if we know that 45% excess of 5% represents (statistically speaking) 40.2% of all losses, then 100% of all losses (averaged over a period) would be around \$18,159,204 (the loss cost or pure risk premium).

We calculate this in cell B19 with the formula =E16/B18\*100

Now, all we need to do to calculate the premium for our layer is to apply the first loss rating scale to the pure risk premium, which we can do as follows:

In cell D3 we calculate the rating factor for our layer. We have already established in cells C4 and C5 that the Limit and Deductible in our example each represent 25% of the PML. We therefore need the formula =VLOOKUP((C4+C5),DATA,2)-VLOOKUP(C5,DATA,2) This will return a value of 11.5 for our example. In cell E3 we can apply this factor to the Pure Risk Premium to arrive at a premium for the contract, using =B19\*D3/100

Finally, we can convert this premium into a rate on GNPI in cell E4 using =E3/B2\*100

**That completes our simple rating model, which you can hopefully modify to suit your individual needs.**



# Appendix 10

## Contract Notes and Example of an MRC Compliant Placing Document

Where monetary amounts are stated within the contract the currency must be clearly and unambiguously identified by using the relevant three-letter ISO currency code, eg USD.

- Currency symbols such as £ or \$ should be avoided, wherever possible. However, where their use is unavoidable (eg where they form part of a policy schedule), a clear statement of their intent (eg “Where the symbol \$ is used in this contract it refers to US Dollars (USD)”) should be used.
- A contract must not include any terms which are unspecific or create ambiguities, for example any “TBA”s (To Be Agreed/ Advised).
- During placing the broker and insurers must ensure that the contract clearly states all the contract terms; references or attaches all standard or registered wordings and clauses where used; and attaches all bespoke and non-standard wordings and clauses in full.
- Insurance laws may require the attachment of a notice to a contract after it has been agreed by the insurer and before it is provided to the insured. An example is the legal requirement for US surplus lines brokers to attach notices in state-prescribed forms to surplus lines contracts. The contract does not have to include such notices at placing, but should contain a reference to the need to attach such notices. Further guidance is provided in appendix A.
- Note - National Laws do not need to be attached in full, as they are in common usage and freely available to all interested parties (eg Marine Insurance Act 1906; German General Rules of Marine Insurance; etc).
- A contract can include subjectivities but if any may be outstanding at inception they must be expressed as unambiguous

conditions and must specify the responsibilities and timescales for resolution and the consequences of failure to do so.

Subjectivities should be imposed within the contract under the Subjectivities heading in the Risk Details section, or within Conditions (eg where the Subjectivity relates to an existing Condition). They must not be recorded against insurers' lines in the Security Details section.

- Standard contract provisions must be relevant to the risk or the administration of that risk.

The following pages show an **example** of the content of an MRC compliant placing document. The example is provided for a US Non-Marine Property risk and illustrates what a compliant placing document could look like, but the specific content will vary by territory and class of business.

***Items in italics are for information only and should not be shown in a real contract.***

## **THE CONTRACT DOCUMENT**

*(A front page or wrapper may be added by the broker. Irrespective of whether such a page is used, the page below will always be page one of the contract.)*

### **Risk Details:**

#### **UNIQUE MARKET**

**REFERENCE :** B0999ABC123456789

**TYPE:** All Risks of Direct Physical Loss or Damage including Boiler Explosion and Machinery Breakdown insurance.

**INSURED:** XXXX American Inc and (1) any subsidiary, allied or affiliated corporation, person, co-partnership or organization engaged in the conduct of XXXX American Inc including partners, officers, directors, employees or agents of any of those organizations as is now or may hereafter be constituted; (2) any other interest to the extent

that the Insured has agreed to keep such interest insured while acting in their capacities as such.

XXXX American Inc shall be deemed the sole agent of each and every Named Insured for the purposes of (a) giving notice of cancellation, either by Insurers or by the Named Insured; (b) giving instructions for change in this policy and accepting changes in this policy and (c) the payment of premiums or receipts of return premiums.

<b>ADDRESS:</b>	Number 1, Big Boulevard, Olympia, Washington (WA) 99999, USA
<b>PERIOD:</b>	Effective from: 1 January 2009 at 12:01pm Pacific Standard Time to: 1 January 2010 at 12:01pm Pacific Standard Time
<b>INTEREST:</b>	Real and Personal Property at the address of the insured, including the additional coverages defined below: Personal Property of the Insured's Officials and Employees while on the Premises of the Insured Improvements and Betterments Business Interruption (Net Profits and/or Fixed Charges) Ordinary Payroll Rental Value/Rental Income Electronic Data Processing Equipment and Machinery and as fully defined in the contract wording and clauses referenced herein.
<b>LIMITS:</b>	USD10,000,000 any one occurrence and in the annual aggregate in respect of Flood and Earthquake separately. Program Sublimits schedule: Earthquake: USD2,000,000 any one occurrence and in the annual aggregate Flood: USD2,000,000 any one occurrence and in the annual aggregate

Boiler & Machinery: USD2,000,000 any one accident

Program Deductibles schedule:

Each claim for loss or damage shall be subject to a combined Property Damage and Time Element deductible as follows:

Earthquake/Windstorm/Flood: USD2,000

All other perils except for the above: USD1,000

**INSURED'S**

**RETENTION:**

20% of 100%.

**TERRITORIAL**

**LIMITS:**

Anywhere within the United States of America

**CONDITIONS:** (*Any bespoke wording or clauses will form part of this section, whereas model or registered wordings or clauses can be referred to by reference as per the following example*)

XYZ Insurer - Primary Property wording

CPROP192 - dated January 2005

NMA 2914 (Amended Perils) Electronic Data

Endorsement A (Section two sub-limit USD 100,000,000).

LMA 5019 Asbestos Endorsement

NMA 2962 Biological or Chemical Materials Exclusion

NMA 1168 Small Additional or Return Premium Clause (U.S.A)

**LOSS PAYEE:**

XXXX Inc, Number 2 Boulevard, Olympia,  
Washington (WA) 99999, USA

**SUBJECTIVITIES:** The Insured shall provide to the Insurer a property survey report on the insured address such report to be prepared by MNO Surveyors ("the Survey"). The Survey shall be so provided by 12:01pm Pacific Standard Time on 31 January 2009 ("the Survey Deadline").

Between inception and the Survey Deadline, cover is provided by the Insurer on the terms and

conditions specified in the contract to which this condition is attached (“the Contract Terms”).

Where the Survey is not submitted to the Insurer by the Survey Deadline, cover shall terminate at the Survey Deadline.

Where the Survey is submitted to the Insurer by the Survey Deadline, cover shall continue from the Survey Deadline on the Contract Terms until expiry of the period of the contract unless and until terminated in accordance with the following paragraph.

In the event that the Survey is unsatisfactory to the Insurer, the Insurer shall have the right, within 14 days of its receipt, to terminate the contract by serving not less than 14 days notice in writing to the Insured at its address shown in the contract, such notice expiring no earlier than the Survey Deadline.

In the event of termination under this survey condition, the Insured shall be entitled to pro rata return of premium for the unexpired period of the contract unless a loss has arisen for which the Insured seeks indemnity under this contract in which case the Insurers shall remain entitled to the premium specified in the Contract Terms.

To the extent that this survey condition conflicts with any other cancellation, notice and premium provision in the Contract Terms, this survey condition shall prevail.

**CHOICE OF  
LAW AND  
JURISDICTION:**

This insurance shall be governed by and construed in accordance with the Revised Code of Washington (RCW). Each party agrees to submit to the exclusive jurisdiction of any

competent court within the United States of America.  
NMA 1998 (24/04/86) Service of Suit Clause:  
A.N.O. Attorneys (or their Nominees)  
211 Main St, Olympia, Washington (WA) 99999,  
USA

**PREMIUM:** USD100,000 (100%) Annual  
Plus:  
USD5,000 (100%) Annual in respect of TRIA  
Plus:  
USD1,000 (100%) Annual in respect of Non-Certified Terrorism

**PREMIUM**

**PAYMENT TERMS:** 60 Day Payment condition – LSW 3000

**TAXES PAYABLE  
BY INSURED AND  
ADMINISTERED**

**BY INSURERS:** None applicable

**RECORDING,  
TRANSMITTING &  
STORING**

**INFORMATION:** Where Broker XYZ maintains risk and claim data/information/documents Broker XYZ may hold data/information/documents electronically.

**INSURER  
CONTRACT**

**DOCUMENTATION:** (*An insurer may specify here any insurer contract documentation requirements that apply to them, eg need for a policy, or policy endorsements, including the policy form to be used.*)

This document details the contract terms entered into by the insurer(s), and constitutes the contract document.

This contract is subject to US state surplus lines requirements. It is the responsibility of the

surplus lines broker to affix a surplus lines notice to the contract document before it is provided to the insured. In the event that the surplus lines notice is not affixed to the contract document the insured should contact the surplus lines broker.

**Information Section:**

The following information was provided to insurer(s) to support the assessment of the risk at the time of underwriting.

Client submission dated November 2008 prepared by Producer Inc and seen by all participants hereon and held on file by Broker XYZ Ltd.

No losses past five years.

EFG burglar alarm system installed at all locations.

ABC sprinkler system installed at Olympia, Washington (WA) 99999 location.

## Security Details

### INSURER'S

#### LIABILITY:

**(This clause LMA3333 should be provided in full and not simply referenced.)**

#### LMA3333

##### **(Re)insurer's liability several not joint**

The liability of a (re)insurer under this contract is several and not joint with other (re)insurers party to this contract. A (re)insurer is liable only for the proportion of liability it has underwritten. A (re)insurer is not jointly liable for the proportion of liability underwritten by any other (re)insurer, nor is a (re)insurer otherwise responsible for any liability of any other (re)insurer that may underwrite this contract.

The proportion of liability under this contract underwritten by a (re)insurer (or, in the case of a Lloyd's syndicate, the total of the proportions underwritten by all the members of the syndicate taken together) is shown next to its stamp. This is subject always to the provision concerning "signing" below.

In the case of a Lloyd's syndicate, each member of the syndicate (rather than the syndicate itself) is a (re)insurer. Each member has underwritten a proportion of the total shown for the syndicate (that total itself being the total of the proportions underwritten by all the members of the syndicate taken together). The liability of each member of the syndicate is several and not joint with other members. A member is liable only for that member's proportion. A member is not jointly liable for any other member's proportion, nor is any member otherwise responsible for any liability of any other (re)insurer that may underwrite this contract. The business address of each member

is Lloyd's, One Lime Street, London EC3M 7HA. The identity of each member of a Lloyd's syndicate and their respective proportion may be obtained by writing to Market Services, Lloyd's, at the above address.

### **Proportion of liability**

Unless there is "signing" (see below), the proportion of liability under this contract underwritten by each (re)insurer (or, in the case of a Lloyd's syndicate, the total of the proportions underwritten by all the members of the syndicate taken together) is shown next to its stamp and is referred to as its "written line".

Where this contract permits, written lines, or certain written lines, may be adjusted ("signed"). In that case a schedule is to be appended to this contract to show the definitive proportion of liability under this contract underwritten by each (re)insurer (or, in the case of a Lloyd's syndicate, the total of the proportions underwritten by all the members of the syndicate taken together). A definitive proportion (or, in the case of a Lloyd's syndicate, the total of the proportions underwritten by all the members of a Lloyd's syndicate taken together) is referred to as a "signed line". The signed lines shown in the schedule will prevail over the written lines unless a proven error in calculation has occurred.

Although reference is made at various points in this clause to "this contract" in the singular, where the circumstances so require this should be read as a reference to contracts in the plural.

**ORDER HEREON:** 80% of 100%

**BASIS OF**

**WRITTEN LINES:** Percentage of whole.

Lines Clause NMA2419.

## **SIGNING**

### **PROVISIONS:**

In the event that the written lines hereon exceed 100% of the order, any lines written "to stand" will be allocated in full and all other lines will be signed down in equal proportions so that the aggregate signed lines are equal to 100% of the order without further agreement of any of the insurers.

However:

- a) in the event that the placement of the order is not completed by the commencement date of the period of insurance then all lines written by that date will be signed in full;
- b) the signed lines resulting from the application of the above provisions can be varied, before or after the commencement date of the period of insurance, by the documented agreement of the insured and all insurers whose lines are to be varied. The variation to the contracts will take effect only when all such insurers have agreed, with the resulting variation in signed lines commencing from the date set out in that agreement.

## **WRITTEN**

### **LINES:**

Each insurer enters their written line here (with continuation pages as necessary)

(Optionally, page numbering of the contract document may cease at the end of the Security Details section where this is preceded by the Risk Details and Information sections, ie a new numbering sequence may be used in the remainder of the document, incorporating the Subscription Agreement, Fiscal and Regulatory, and Broker Remuneration and Deductions sections. It is also optional for the broker to insert a divider at this point.)

## **Contract Administration and Advisory Sections:**

*(The above is an optional heading.)*

### **Subscription Agreement Section**

**SLIP LEADER:** ABC Insurer

*(The heading name of Slip Leader, rather than Contract Leader, has been retained in order to maintain consistency with the GUA and other publications.)*

#### **BASIS OF AGREEMENT**

##### **TO CONTRACT**

##### **CHANGES:**

GUA (October 2001) with Non-Marine Schedule (October 2001)

#### **OTHER AGREEMENT**

##### **PARTIES FOR**

##### **CONTRACT CHANGES,**

##### **FOR PART 2 GUA**

##### **CHANGES ONLY:**

Slip leader only to agree part two changes.

#### **AGREEMENT**

##### **PARTIES FOR**

##### **CONTRACT CHANGES,**

##### **FOR THEIR**

##### **PROPORTION ONLY:**

DEF Company Ltd to agree all contract changes.

#### **BASIS OF CLAIMS**

##### **AGREEMENT:**

Claims to be managed in accordance with the Lloyd's 2006 Claims Scheme and IUA claims agreement practices. All Non-Bureaux insurers to agree claims each for their own proportion only.

#### **CLAIMS**

##### **AGREEMENT PARTIES:**

Slip Leader, plus DEF company and Xchanging Claims Services.

**CLAIMS**

**ADMINISTRATION:**

Broker XYZ and insurers agree that any claims hereunder (including any claims related costs/fees) will be notified and administered via ECF with any payment(s) processed via CLASS, unless both parties agree to do otherwise.

**RULES AND EXTENT**

**OF ANY OTHER**

**DELEGATED**

**CLAIMS AUTHORITY:**

None, unless otherwise specified here by any of the **claims** agreement parties shown above.

**EXPERT(S) FEES**

**COLLECTION:**

Broker XYZ Ltd to collect fees.

**SETTLEMENT**

**DU<sup>E</sup> DATE:**

1<sup>st</sup> April 2009.

**BUREAU**

**ARRANGEMENTS:**

(eg A contract checking service from XIS may be referenced here.)

**NON-BUREAU**

**ARRANGEMENTS:**

(eg A contract checking service from another provider may be referenced here.)

## Fiscal and Regulatory Section

### TAX PAYABLE BY

**INSURER(S):** None applicable

**COUNTRY OF ORIGIN:** United States of America

**OVERSEAS BROKER:** Broker XYZ, Downtown, Olympia,  
Washington (WA) 88888, USA

### SURPLUS LINES

**BROKER:** Broker XYZ, Downtown, Olympia,  
Washington (WA) 88888, USA  
Surplus Lines Number: 1234567

**STATE OF FILING:** Washington (WA)

**US CLASSIFICATION:** US Surplus Lines

### ALLOCATION OF

**PREMIUM TO CODING:** *(Enter Risk Code(s) and any allocation.)*  
P2 (100%) US primary  
6T (100%) TRIA  
TO (100%) Non-Certified Terrorism

### FSA CLIENT

**CLASSIFICATION:** Large Risk

**Broker Remuneration and Deductions Section**

**FEE PAYABLE**

**BY CLIENT?:** No

**TOTAL BROKERAGE:** Z%

**OTHER**

**DEDUCTIONS**

**FROM PREMIUM:** 5% Survey fee payable to XYZ Inc

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