

M.C.E. 1979 INTERNATIONAL INSURANCE CONFERENCE

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Y. DE NYS - WORKSHOP NR. 1

INSURANCE OF INDIVIDUAL PROPERTY RISKS BY LAYERING

Discussion Outline

- A. Introduction
- B. Purposes, benefits and disadvantages of layering risks.
  - Definition of layering
  - Origin of layering
  - Development of layering
  - Sorts of risks to be taken into consideration
  - Purposes and benefits : = to brokers  
= to insurers/reinsurers  
= to insureds
  - Disadvantages
- C. Types of layering and their structuring
  - Various types of layers
  - Various types of limits
  - Direct layers, excess reinsurance
  - Structuring of layers
  - Complex structure
- D. Pricing of layers
  - Basic principle
  - Method of pricing single risks
  - Pricing of multi-location and multi-risks.
  - Types of premium
- E. Marketing of layers
  - Basic principles and requirements
  - Market : = primary  
= excess
  - Marketing approach : = primary  
= excess
  - General considerations
- F. General Discussion

A. INTRODUCTION

The subject of layering property risks which I was kindly requested to handle at this meeting relates to the introduction of a new dimension to the business.

In view of the recent introduction of this feature I believe it is difficult to be an expert and at the utmost one can claim some experience.

For this reason I have insisted with MCE that this session should be of a workshop type.

## B. PURPOSES, BENEFITS AND DISADVANTAGES OF LAYERING RISKS

The principle of layered cover is simple : the overall sum insured is divided into layers. A typical example would be to divide the cover into four sections : up to Pds 1,000,000, Pds 1,000,000. to Pds 5 million, Pds 5 million to Pds 10 million, more than Pds 10 million.

Each layer is then placed with different insurers and treated as a separate contract with an identical wording.

That type of layered cover is quite common in liability insurance, especially product liability and professional indemnity. It is a fairly new idea, however, in fire insurance. It has developed rather slowly, starting from the original idea of deductibles in fire insurance.

In the late 1960s, many brokers found difficulty in getting full cover for very large risks. UK fire insurers at the time were making serious losses and there was a shortage of fire capacity.

Some very large risks had consequently an upper loss limit written into the policy and brokers had to seek cover for that top layer from the catastrophe insurance market.

The usual layers are : self-insured, up to the deductible limit; insured, up to the limit of the estimated maximum loss; and the top catastrophe layer.

The modern advocates of layered cover then developed the system into as many as eight layers.

Although the period of capacity shortage is long since over brokers have found a way by layering risks to compete with the traditional tariff markets.

At a later stage this new practice has shown to give more flexibility to all parties concerned and layering has now gradually become an insurance practice.

The cost of insuring buildings and factories against fire continues to rise with inflation and insurance managers and brokers are under pressure to contain this rise.

Some sophisticated schemes are being devised aimed at keeping down costs. One of the latest to appear concerns "layered" fire insurance.

First of all, to clear the air on what sort of risks we are talking about we should define those individual risks which are amenable to layering and those which are not.

Negatively, there is no benefit at all in layering small or medium-small risks which are able to be handled easily inside the framework of a full-value insurance. Thus householder, office and general low-hazard, low-value risks are rarely good ground for layering as there is a large market of insurers with great capacity to insure these on a full-value basis at very competitive rates.

On the other hand, individual risks with large values and greater hazard (either from the point of view of occupation or construction) may well lend themselves to the layering concept because, basically, a conventional, full-value insurance market has problems in providing the necessary capacity for the broker's or the insured's needs.

Although this is slightly simplistic, it is necessary to be clear at the start on the type of risks we are talking about - generally then, the medium-large to large-value risks with hazardous sides attached lead to be layered.

Having said that we can split purpose and benefits of layering into three categories - the broker's, the insurer's and the insured's points of view.

A. PURPOSE OF AND BENEFITS TO BROKER IN LAYERING.

WE SEE THAT ALL THE OBJECTIVES OF A BROKER CAN BE MET BY  
LAYERING.

- A) PROVIDE THE BEST POSSIBLE SCOPE OF COVERAGE
- B) OBTAIN THE BEST POSSIBLE TERMS (PRICES)
- C) PLACE THE RISK WITH GOOD FINANCIAL SECURITY
- D) HAVE AN INCREASED CHANCE TO COMPLETE THE RISK (HAVE  
A LINE FROM MOST UNDERWRITERS)
- E) PLACE THE RISK AT THE LEAST COST TO THE BROKERAGE  
HOUSE (PLACING & SERVICING)
- F) PRODUCE THE HIGHEST COMMISSION INCOME (THERE IS AN  
INCENTIVE FOR THE BROKERS TO TURN THE MONEY AROUND).

B. PURPOSE AND BENEFITS TO INSURERS OR REINSURERS

1. MORE FLEXIBILITY - UNDERWRITERS CAN PARTICIPATE ON A QUOTA SHARE BASIS OR SELECTED LAYERS.
2. COMMITMENT IS A PERCENTAGE OF LIMIT RATHER THAN S/I - PROTECTION AGAINST ERRORS IN CALCULATING EML'S.
3. CATASTROPHIC EXPOSURES ARE MORE PRECISELY DEFINABLE.
4. THE REINSURERS HAVE GREATER CONTROL OVER THE PREMIUM THEY CAN OBTAIN FOR A GIVEN RISK SO THAT THE REINSURER CAN CIRCUMVENT ANY APPARENT UNDER-RATING OF THE ORIGINAL RISK.
5. COMPANIES THAT EMPLOY WORKING EXCESS OF LOSS TREATIES AS THEIR PRIMARY REINSURANCE COVER FIND IT ADVANTAGEOUS TO PLACE THEIR FACULTATIVE REINSURANCE ON AN EXCESS BASIS TOO.
6. THE ADMINISTRATIVE COSTS ARE FAR LESS FOR BOTH PARTIES.
7. THE REINSURER HAS NO LIABILITY FOR THE FREQUENCY LOSSES (SMALL)
8. THE CEDING COMPANY OBTAINS A 100 % PROTECTION AGAINST THE LARGE LOSSES WHICH COULD STRAIN ITS FINANCIAL CAPACITY.

C. PURPOSE AND BENEFITS TO INSURED

1. TAKES FULLY ADVANTAGE OF ALL MARKETS.
2. REDUCES HIS TOTAL COST.
3. GIVES HIM POSSIBILITY TO SWITCH TO A SELF-INSURED SYSTEM, USUALLY THROUGH A CAPTIVE INSURANCE COMPANY.
4. IS LESS DEPENDENT ON A SIGNLE LEADER.
5. A LOSS SITUATION WILL OFTEN ONLY AFFECT ONE OR TWO LAYERS, THE EFFECT ON RENEWAL PREMIUM WILL BE LESS IMPORTANT THAN IF IT WAS QUOTA SHARE.

D. DISADVANTAGES

- WHEN THE INSURANCE COMES UP FOR RENEWAL AND THE INSURER IN THE BOTTOM LAYER REFUSES TO RENEW, THE SCHEME COLLAPSES LIKE A HOUSE OF CARDS. THE BROKERS MAY HAVE DIFFICULTY IN RECONSTITUTING IT.
- THERE IS A DANGER FOR GAPS IN THE POLICY (TERMS AND CONDITIONS) EX. : - WHICH COURT ?
  - DIFFERENT WORDINGS
- MORE POTENTIAL LEADERS ON VARIOUS LAYERS.
- CATASTROPHE LAYERS MAY REQUIRE MIN. PREMIUM PUSHING OVERALL COST UP.



## C. TYPES OF LAYERS AND THEIR STRUCTURING

### Types of Layers

If investment earnings on the insurance funds and administrative costs are ignored, and it being assumed that the company charges its insured and in turn pays to its reinsurer, a premium equal to the actuarial value of the risk transferred in each case then we have the following :

1. **Deductible** : this is a lump sum deductible from each claim or from an accumulation of claims during a certain period (aggregate). Simple deductibles are in widespread use to eliminate small claims with disproportionately high claims. Large deductibles have traditionally been resisted by insurers. For example : the Fire officer committee tariff in the UK limited D/A to Pds 10,000 as exceptionally Pds 25,000. The same in many other countries. Nevertheless their use is increasing. The aggregate D/A is less frequently encountered in direct insurance markets but is common in reinsurance treaties as stop-loss insurance and may therefore be accessible to captives.
2. **Stop-loss - first loss** : This is in effect a mirror image of the deductible arrangement. With a first loss cover the insured is left to bear the balance of any loss falling above the first loss limit. What are disadvantages to the insured are advantages for the insurer. The large losses are generally the least predictable, cause most difficulty in rating and require the allocation of part of the premium to reserves. Consequently insurers are willing to grant more realistic premium reductions for restriction of cover on a first loss basis. The lower the first loss limit in relation to the maximum possible loss the larger the premium reduction compared

with the full value insurance. As parties to a reinsurance contract have conflicting interest, the key factor is the premium loading for variance so that the optimal contract must appear as a reasonable compromise between those interests. The first loss concept is usual to property risks where the loss potential is thought to be far less than the full value at risk.

3. Primary layer - self funding or not
4. Sandwich layers within PML / beyond PML - buffer or middle layers
5. Upper layers (up to MPL)
6. Catastrophe layers
7. Sleep easy

The structure can be a direct layering or reinsurance.

This analysis can be criticized on the ground that the assumption that premiums are equal to loss expectancies obviously is highly unrealistic. Insurers and reinsurers not only load their risk premium to allow for expenses and profit, but the variability of losses must also be taken into account. Consequently some of the advantages the ceding company gains by effecting excess of loss cover rather than proportional reinsurance will tend to be lost because of the relatively larger allowance the reinsurer will need to make for loss variability when pricing the cover provided.

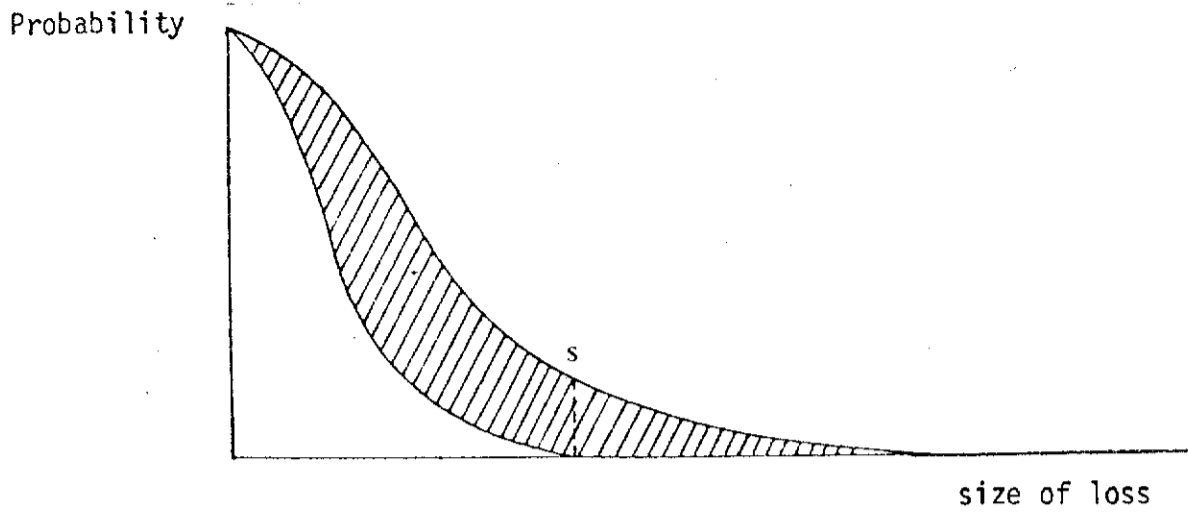
Where risk directly layered usually find that the sum of all layers does not equal full values necessarily (although this may be so) but that the total resembles a Loss Limit exceeding a cautious estimate of the Maximum Possible Loss (MPL).

TYPES OF LAYERS

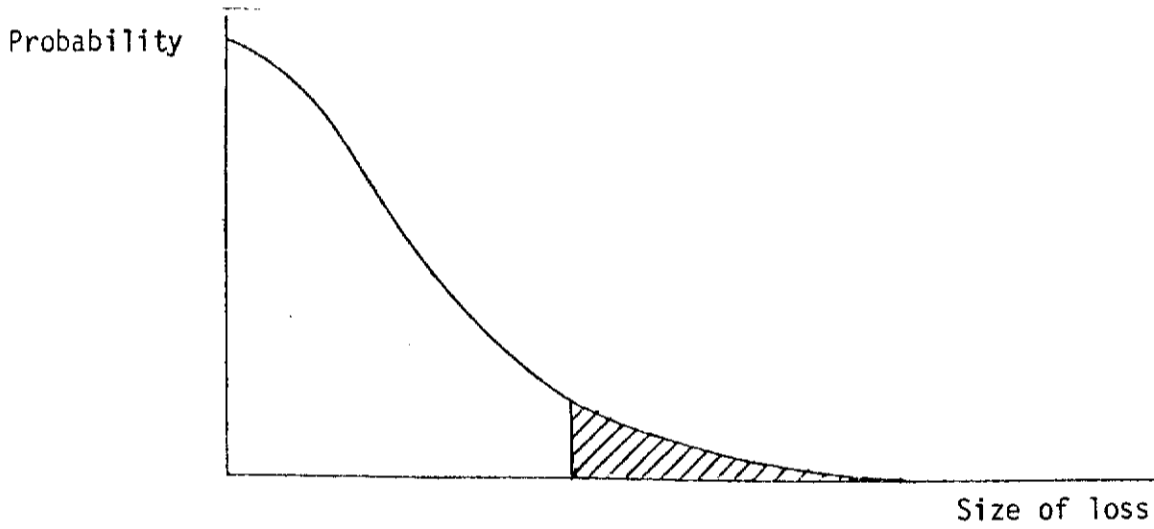
1. DEDUCTIBLE
2. STOP LOSS - FIRST LOSS (LOSS LIMIT)
3. PRIMARY LAYER (SELF FUNDING OR NOT)
4. MIDDLE - SANDWICH OR BUFFER LAYER (WITHIN OR BEYOND PML).
5. UPPER LAYER (UP TO MPL).
6. CATASTROPHE LAYER.
7. SLEEP EASY.

# TYPES OF LAYERS AND THEIR STRUCTURING

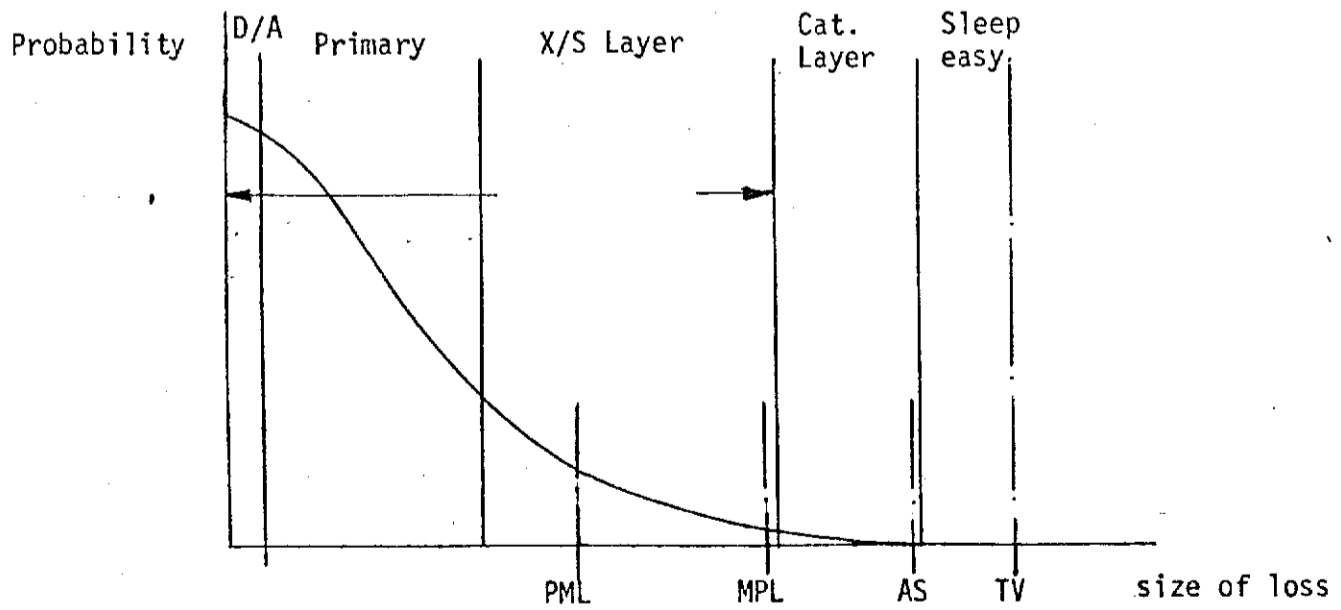
## Surplus Reinsurance



## Excess Reinsurance



## Layered Structure



TYPES OF LIMITS

A. - MONETARY LIMITS

- TIME LIMITS

- PERCENTAGE LIMITS

B - ANY ONE OCCURRENCE BASIS

- ANY ONE LOSS BASIS

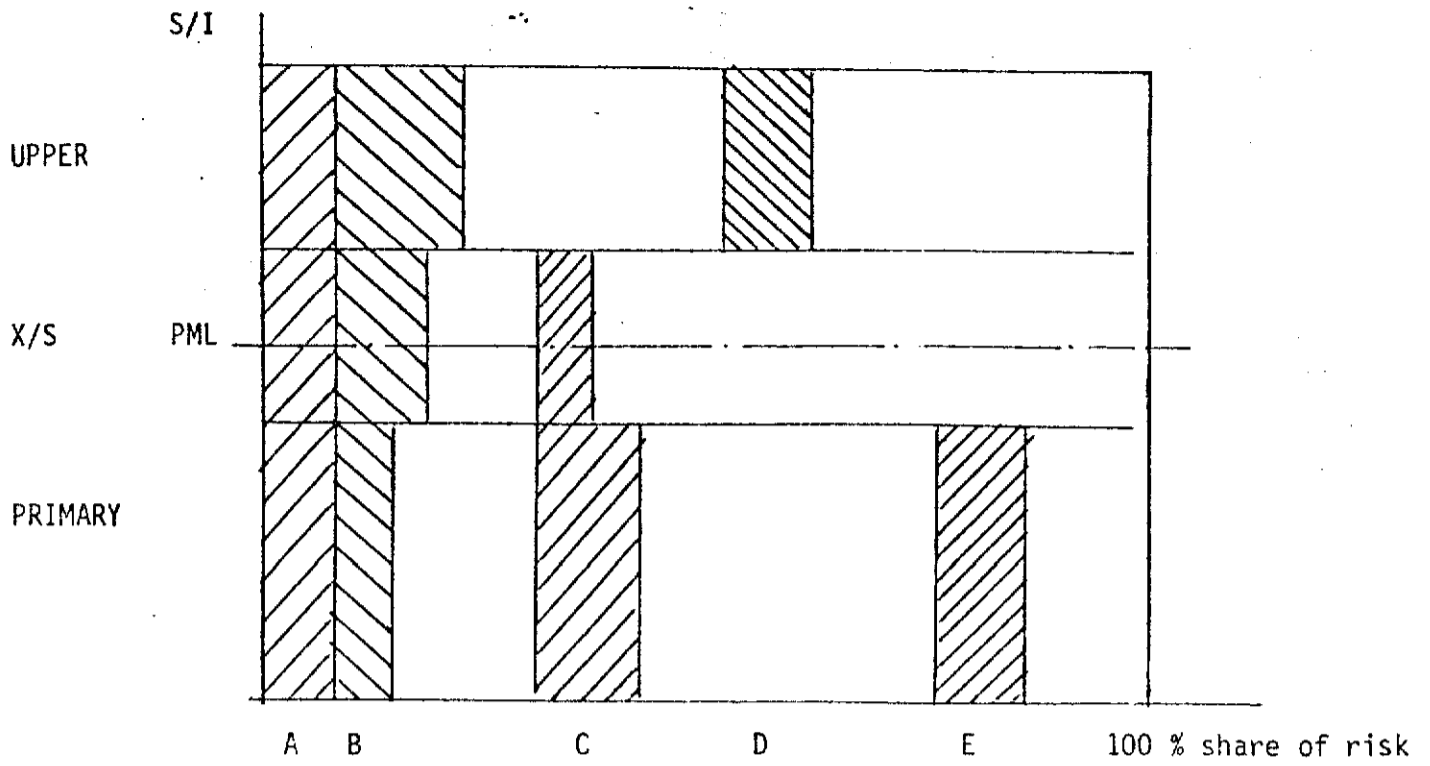
- ANY ONE LOCATION/INSURED BASIS

- ANY ONE LOSS BUT IN THE AGGREGATE ANNUALLY FOR QUAKE  
AND FLOOD

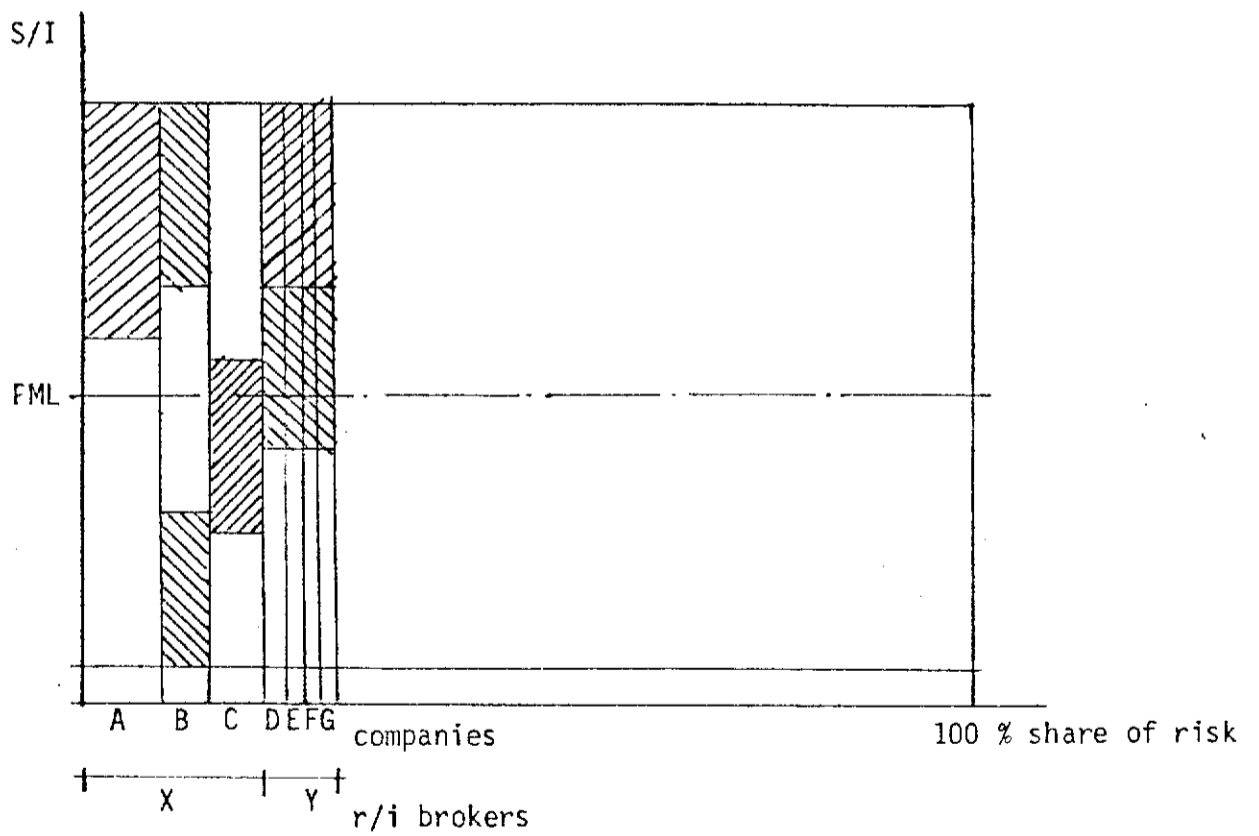
C. - SINGLE RISK BASIS

- MULTI-LOCATION BASIS OR MULTI-RISK

DIRECT LAYERED STRUCTURE

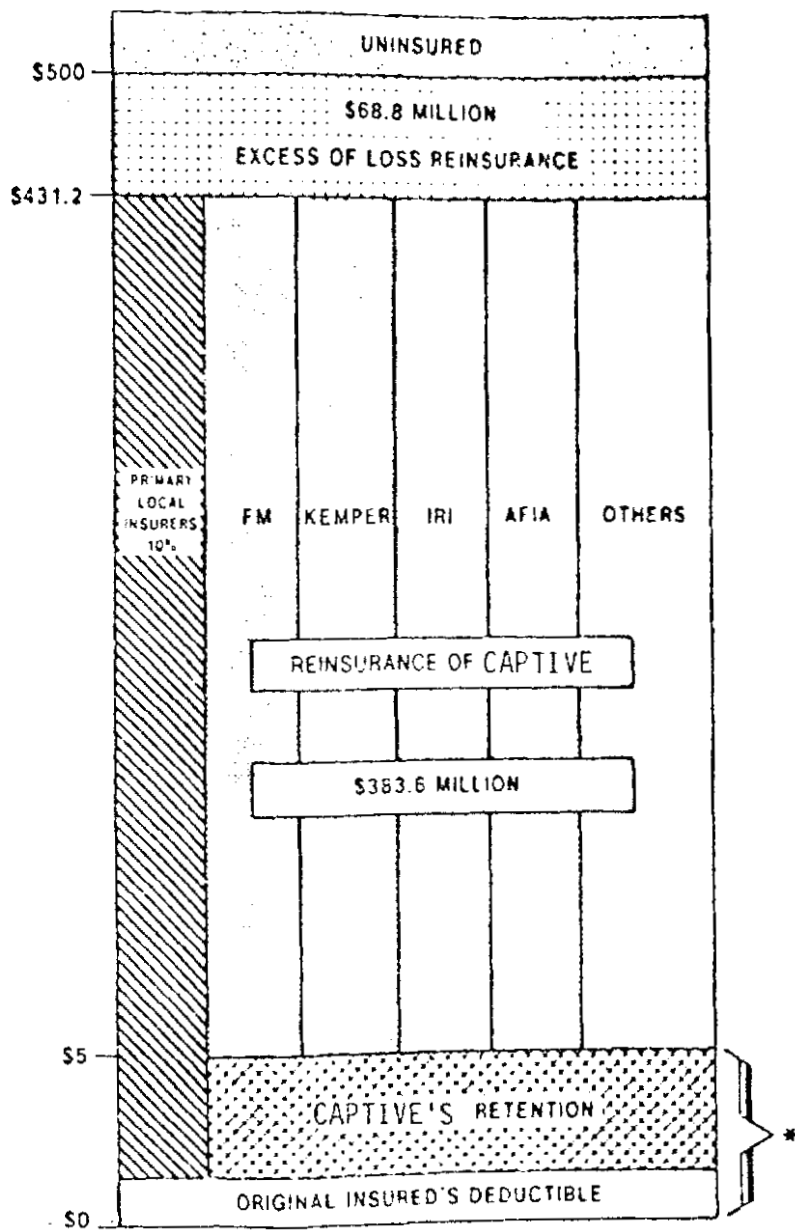


EXCESS REINSURANCE STRUCTURE



PROPOSED 1980 REINSURANCE ARRANGEMENTS  
FOR NON U.S. HPR PROPERTIES

COMBINED PROPERTY DAMAGE AND BUSINESS INTERRUPTION  
(IN MILLIONS)



## Types of limits

- A. - Monetary limits
  - Time limits
  - Percentage limits
  
- B - Any one occurrence basis
  - Any one loss basis
  - Any one location/insured basis
  - Any one loss but in the aggregate annually for Quake and Flood
  - Single risk basis
  - Multi-location basis or multi-risk

## Structuring

### D. PRICING OF LAYERS

#### 1. Basic principles only.

No rigid tables

- a) Same technical principles as in quota share risks
  - i.e.
    - construction, occupancy
    - protection, housekeeping
    - loss experience
    - insured peril
    - scope of coverage
- b) Method of pricing varies whether
  - direct layering (where premium amount is changed)
  - internal layering (reinsurance of another company - premium expressed as percentage of OGP or ONP).



PRICING OF LAYERS

1. BASIC PRINCIPLES.

NO RIGID TABLES

A) SAME TECHNICAL PRINCIPLES AS IN QUOTA SHARE RISKS I.E.

- CONSTRUCTION, OCCUPANCY
- PROTECTION, HOUSEKEEPING
- LOSS EXPERIENCE
- INSURED PERIL
- SCOPE OF COVERAGE

B) METHOD OF PRICING VARIES WHETHER

- DIRECT LAYERING (WHERE PREMIUM AMOUNT IS CHANGED)
- INTERNAL LAYERING (REINSURANCE OF ANOTHER COMPANY - PREMIUM EXPRESSED AS PERCENTAGE OF OGP OR ONP).

C) WHETHER SUM INSURED IS

- FULL VALUE
- LOSS LIMIT

D) FIRSTLY ONE MUST GAUGE THE OVERALL PREMIUM REQUIRED FOR THE FULL VALUE COVERED TAKING INTO ACCOUNT THE COVERED PERIOD (F, L, E, ETC. PLUS EC OR AR)

E) IF FIRST LOSS ONE HAS TO APPLY ONE OF THE FIRST LOSS SCALES AVAILABLE

F) EACH LAYER IS THEN CONSIDERED SEPARATELY

FIRST LOSS SCALE

<u>% of values</u>	<u>% of total premium</u>	<u>% of values</u>	<u>% of total premium</u>
1.00	32.50	20	70.000
1.10	33.00	21	71.000
1.20	33.50	22	72.000
1.30	34.00	23	73.000
1.40	34.50	24	74.000
1.50	35.00	25	75.000
1.60	35.50	26	75.625
1.70	36.00	27	76.250
1.80	36.50	28	76.875
1.90	37.00	29	77.500
2.00	37.50	30	78.125
2.10	37.75	31	78.750
2.20	38.00	32	79.375
2.30	38.25	33	80.000
2.40	38.50	34	80.220
2.50	38.75	35	80.550
2.60	39.00	36	80.880
2.70	39.25	37	81.210
2.80	39.50	38	81.540
2.90	39.75	39	81.870
3.00	40.00	40	82.200
3.10	40.50	41	82.550
3.20	41.00	42	82.800
3.30	41.50	43	83.000
3.40	42.00	44	83.300
3.50	42.50	45	83.600
3.60	43.00	46	83.900
3.70	43.50	47	84.210
3.80	44.00	48	84.460
3.90	44.50	49	84.700
4.00	45.00	50	85.000
4.00	45.50	51	85.200
4.20	46.00	52	85.400
4.30	46.50	53	85.600
4.40	47.00	54	85.800
4.50	47.50	55	86.000
4.60	48.00	56	86.200
4.70	48.50	57	86.400
4.80	49.00	58	86.600
4.90	49.50	59	86.800
5.00	50.00	60	87.000
6.00	52.00	61	87.200
7.00	54.00	62	87.400
7.50	55.00	63	87.600
8.00	56.00	64	87.800
9.00	58.00	65	88.000
10.00	60.00	66	88.200
11.00	61.00	67	88.400
12.00	62.00	68	88.600
13.00	63.00	69	88.800
14.00	64.00	70	89.000
15.00	65.00	71	89.200
16.00	66.00	72	89.400
17.00	67.00	73	89.600
18.00	68.00	74	89.800
19.00	69.00	75	90.000
20.00	70.00	76	90.400

PRIMARY LAYER

This is in effect taken as a Loss Limit within an overall Loss Limit - as such Lloyds First Loss scale is not of much help as purely taking difference between Loss Limit % figures for overall pricing of all layers and L.L. % figures for Primary can produce such figures as this :

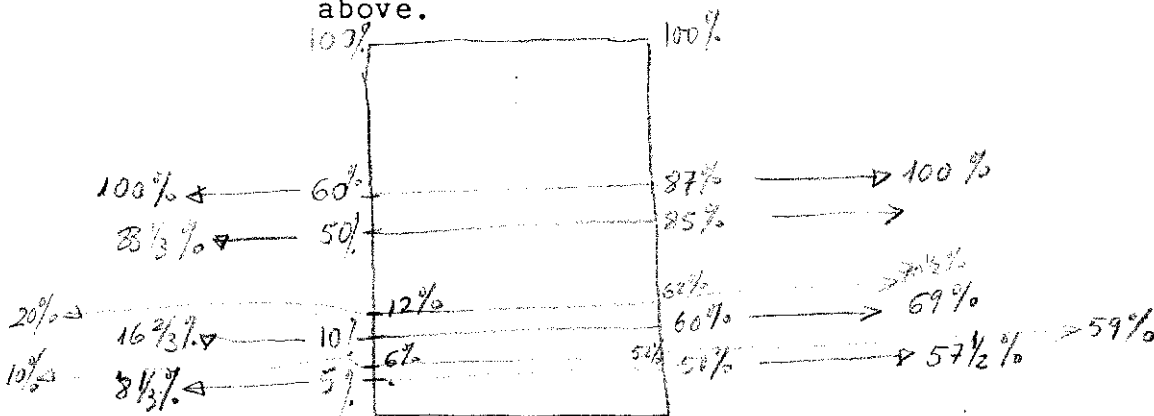
L.L. % overall layers	Prem. %	Balance for upper layers
1) 60 % gets 87 % full value prem.	5 % gets 50 %	37 %
2) " " " " " "	10 % gets 60 %	27 %
3) 50 % gets 85 % full value prem	5 % gets 50 %	35 %
4) " " " " " "	10 % gets 60 %	25 %

Now, if you take proportion layers above primary base to the Loss Limits overall classes you end up with :

- 1) Total excess layers =  $91 \frac{2}{3} \% \text{ x/s } 8 \frac{1}{3} \% \text{ for } 42 \frac{1}{2} \% \text{ overall prem for LL}$
- 2) " " " =  $83 \frac{1}{3} \% \text{ x/s } 16 \frac{2}{3} \% \text{ for } 31 \% \text{ " " " "}$
- 3) " " " =  $90 \% \text{ x/s } 10 \% \text{ for } 41 \% \text{ " " " "}$
- 4) " " " =  $80 \% \text{ x/s } 20 \% \text{ for } 29 \frac{1}{2} \% \text{ " " " "}$

Now, bearing in mind that in the cases above the Primary portion of the total risk values is very small and in most cases (we are talking of high-risk insurances) does not absorb all of Probable Maximum Loss estimates, these figures will be totally unacceptable to the insurers on the layers above.

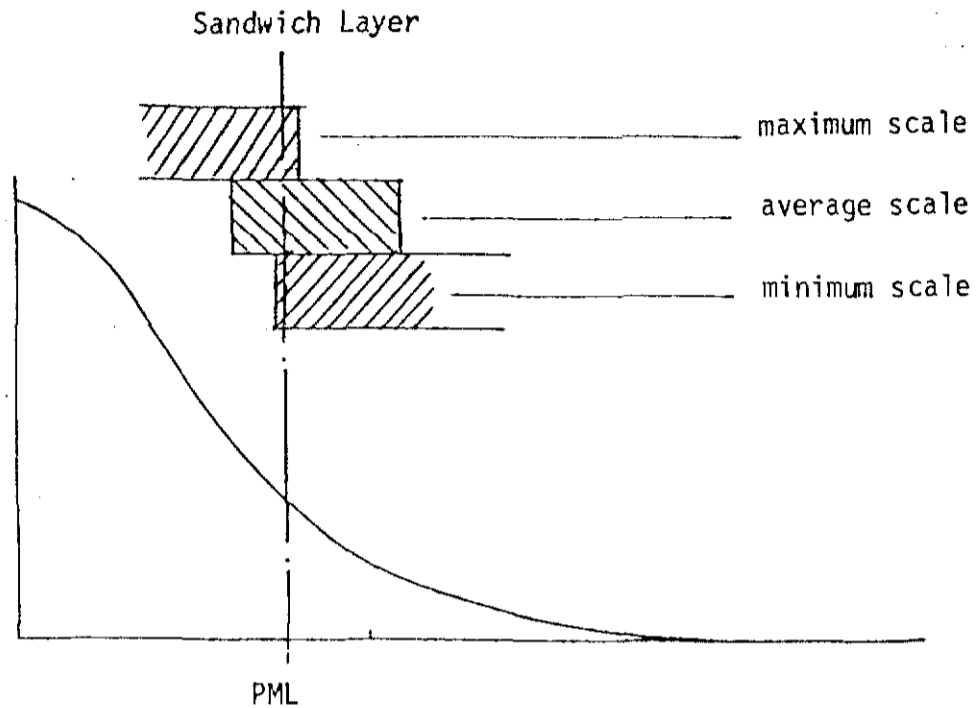
As such is the case, the amount of premium going to the Primary layer has to be lower than the above examples would give and the amount of differences between the figure chosen and Lloyds first loss or similar scale will be greater where more of the Probable Maximum Loss is taken up by the layers above.



PRICING OF SANDWICH LAYERS

THERE IS NO FIXED RATING OR SCALES. UNDERWRITERS MUST WORK OUT THEIR SCALES IN FUNCTION OF PML EXPOSURE WITHIN AND BEYOND PML.

THIS GIVEN : .



PRICING STEPS :

- A. WHAT LOSS LIMIT PERCENTAGE OF FULL VALUE RATE
- B. WHAT IS THE PERCENTAGE VALUES COVERED BY THE LAYER CONSIDERED OF THE LOSS LIMIT
- C. WHAT PERCENTAGE OF LAYER CONSIDERED IS EXPOSED IN THE PML
- D. SEE ON SCALES PERCENTAGE OF ONR.

PRICING OF SANDWICH LAYERS WITHIN AND BEYOND PML.

EXAMPLE

OIL REFINERY TO BE COVERED AGAINST F. L. EX. A.

T.V. : \$ 200,000,000

MPL : \$ 100,000,000

PML : \$ 40,000,000

LOSS LIMIT : \$ 100,000,000

OGR : 2.5 % ON TV COMM. 15 %

OGP : \$ 500,000 ONP : \$ 425,000

PRIMARY : \$ 20,000,000

1ST LAYER : \$ 30,000,000 X/S 20,000,000

2ND LAYER : \$ 50,000,000 X/S 50,000,000

PRICING FIRST LAYER

- UPPER LIMIT IS \$ 50 MIO I.E. 50 % OF L.L. THIS IS WORTH 85 % ON FIRST LOSS SCALE.
- LAYER \$ 30 MIO X/S 20 MIO COVERS 60 % X/S 40 %  
\$ 30 MIO IS \$ 20 MIO EXPOSED IN PML I.E. 66 % WITHIN PML  
SO AVERAGE MAXIMUM SCALE IS APPLICABLE. ON THE X/S SCALE  
THIS IS WORTH SAY 32.5 %
- LAYER SHOULD PAY 32.5 % OF 85 % OR 27.65 %  
IF DIRECT LAYER RATE IS 25 % X 27.65 % = 0.69 % ON TV'S.  
IF R/I X/S LAYER RATE IS 27.65 % OF ONP

PRICING OF SECOND LAYER

- UPPER LIMIT IS \$ 100 MIO I.E. L.L. WORTH 100 % PREMIUM.
- LAYER \$ 50 MIO X/S 50 MIO COVERS 50 % X/S 50 %. \$ 50 MIO EXCESS IS ALL OUT OF PML - SO MINIMUM SCALE IS APPLICABLE - WORTH 19 %.
- LAYER SHOULD PAY 19 % .
- IF DIRECT LAYER RATE AT 0.48 %/.. ON TV'S.
- IF R/I EXCESS LAYER RATE AT 19 % OF ONP.

ALTERNATIVE APPROACH

- APPLY SAME REASONING TO THE SAME TWO LAYERS COMBINED I.E.

8 80 MIO X/S 20 MIO.

- UPPER LIMIT IS 8 100 MIO WORTH 100 %

- LAYER 8 80 MIO X/S 20 MIO COVERS 80 % X/S 20 % AND IS 75

% BEYOND AND 25 % WITHIN PML. ON THE X/S SCALE THIS IS

WORTH 39 1/2 % .

- THE INDIVIDUAL CALCULATION ADDED UP TO 46.65 %

- IN PRESENT SOFT MARKET CONDITIONS THE EXPERIENCED UNDER-

WRITER WOULD FIX ON AROUND 42 % OF ORIGINAL RATE, SPLIT AS

FOLLOWS :

8 30 MIO X/S 20 MIO AT 26 % OF ONP

8 50 MIO X/S 50 MIO AT 16 % OF ONP

METHODS OF PRICING MULTI-RISK OR MULTI-LOCATIONS

AN IDENTIFIACL EXERCISE HAS TO BE DONE FOR EACH LOCATION OR RISK OF THE POLICY.

THE NET PREMIUM IS CALCULATED FOR EACH LAYER AND EACH LOCATION.

ONCE THIS IS COMPLETED, ALL PREMIUMS ARE ADDED UP PER LAYER AND EVENTUALLY CONVERTED INTO A PERCENTAGE OF ONP.

Location	TV	PML	MPL	ONP	P r e m i u m f o r		
					Primary	X/S	Upper Layer
				P	X	Y	Z

X/P = % of ONP for primary

Y/P = % of ONP for excess

Z/P = % of ONP for upper layer



PRICING OF CATASTROPHE LAYER

THESE LAYERS ARE BOUGHT FOR UNKNOWN OR IMPONDERABLE RISKS.

THIS MIGHT INCLUDE :

- EARTHQUAKE
- TSUNAMI (TIDAL WAVE)
- VAPOUR CLOUD EXPLOSION - BEYOND EXPECTATION
- BOEING 707 DROPPING IN THE MIDDLE OF A PLANT.
- OTHER UNFORESEEN ELEMENTS ACTUALLY COVERED BY THE POLICY TERMS.

ALL FOREGOING COULD CONCEIVABLY DESTROY ALL ESTIMATES OF MAXIMUM POSSIBLE LOSS (WHICH NORMALLY BASED ON FIRE PERILS AND QUAKE IN A KNOWN QUAKE AREA).

IN THE FOREGOING EXAMPLE :

IF PLANT OUTSIDE QUAKE AREA AND NOT NEAR AIRPORTS, INSURERS MIGHT BE ASKED TO QUOTE CAT LAYER OF \$ 20,000,000 X/S \$ 100,000,000. THE LOSS LIMIT BECOMES \$ 120,000,000.

PRICING STEPS

A) ADD UP RATES FOR VARIOUS IMPONDERABLE PERILS.

B) APPLY SAME EXCESS PRICING PRINCIPLE.

C) OFTEN PRICE WILL BE TOO LOW AND THIS PROVES THERE IS NO  
GOOD INDICATOR.

D) RATE HAS TO BE GAUGED ON BASIS OF CATASTROPHIC EXPOSURE  
AND IS SHOWN OFTEN AS BEING MINIMUM PREMIUM ON LINE  
DEPENDING ON INSURER'S EXPERIENCE.

TYPES OF PREMIUM

FLAT PREMIUM

FIXED PREMIUM RATE ON ONP (R/I) OR RATE ON TV (DIRECT).

MARKETING OF LAYERS

- MARKET

PRIMARY - LONDON MARKET.

- BRITISH AND FOREIGN DIRECT WRITING COMPANIES.
- LLOYDS UNDERWRITING SYNDICATE
- SOME PROFESSIONAL REINSURERS.
- SOME OVERSEAS COMPANIES.

EXCESS - LONDON EXCESS UNDERWRITERS.

- OR BRUSSELS MARKET.
- OR SOME PROFESSIONAL REINSURERS.
- PARIS MARKET.
- SOME U.S. COMPANIES.

- MARKETING

PRIMARY LAYER : - FIRST IN LONDON TO EXTINCTION.

- THEN BLANKET MARKETING WW WITH UP TO 150 COMPANIES.

EXCESS LAYERS : - FIRST MIDDLE OR SANDWICH LAYERS WITH LONDON OR BRUSSELS OR PROFESSIONAL MARKET.

- THEN TOP LAYERS

FRONTING MORE AND MORE DIFFICULT BECAUSE COMPANIES ARE MORE AND MORE CAREFUL ABOUT SECURITY.