

EARTHQUAKE INSURANCE

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INTRODUCTION

This paper is about insuring buildings and contents against the risk of earthquake. There are problems encountered with the assessment and underwriting of the earthquake risk, and there are lessons to be learnt by insurers following the Edgcombe and Mexico earthquakes. Discussing these matters will lead to conclusions and recommendations that:

- (a) The exposure to the seismic risk must be properly assessed, costed, and spread more equitably amongst the community;
- (b) All parties likely to be involved in an earthquake should establish closer relationships now to improve disaster planning to cope with a great earthquake.

BACKGROUND

Insurance against Fortuities

The main difference between Life Assurance and Fire and Casualty Insurance is that the former assures the policyholder of the payment of a predetermined sum of money if the policyholder survives to a maturity date, or in the event of death. Fire and Casualty Insurance of property may or may not result in the payment of monies, the amount of which is not necessarily predetermined and the insured peril or event may or may not occur. Life Assurance relates to assured events whilst Property Insurance relates to fortuities. It could be said that earthquake insurance is the exception which proves the rule for earthquakes will occur in New Zealand; it is just a question of when and where.

Earthquake and War Damage Act

New Zealanders are fortunate to have the protection of the benefits provided by the Earthquake and War Damage Act 1944. To qualify for such protection, the person is required to have a current contract of insurance with a direct insurer transacting business in New Zealand and one of the insured events must include loss or damage by fire. The maximum amount payable is

limited to the sum insured or "indemnity value at time of loss, whichever is the lesser sum. For this protection the policyholder pays a premium of 5 cents for each \$100 of cover. This is collected by the direct insurer on behalf of the Earthquake and War Damage Commission, certain property is excluded from the cover provided by the Act, and if policyholders require insurance protection for such excluded items they should endeavour to insure these with the Commission or a direct insurer.

"Indemnity Value"

Indemnity has many definitions, one being the depreciated value of property at the time of loss. If policyholders require protection against the risk of earthquake up to the replacement or reinstatement value of property they are required to insure for the "excess of indemnity" with direct insurers. The relevant policy wording should take careful cognisance of the Act and "dove-tail" into it.

"Excess of Indemnity"

As the gap between indemnity (or depreciated value or market value), and replacement or reinstatement cost increases, exacerbated by inflationary trends, then the demand for this additional cover or "excess of indemnity" increases the exposure of insurance companies to the consequences of a major earthquake.

Exposure to Catastrophe

This increasing exposure is a very real problem and is the subject of a special earthquake project undertaken by the United States National Committee on Property Insurance in the area of catastrophe management planning. I quote from their letter dated 4 November 1987 addressed to the Commissioner of Insurance of California:-

"Experts are forecasting the financial devastation of the Property-Casualty Insurance Industry in the event of a major earthquake. When and where, in the United States the catastrophic earthquake will strike is not known, but it is a certainty it will happen. The potential exists that the insured damage may equal or exceed US\$60 billion. Can financial ruination be avoided? If so, how?"

Commercial Union Insurance
Wellington
NEW ZEALAND

Valuation Certificates

Direct insurers in New Zealand invariably require valuation certificates to be completed by valuers, quantity surveyors, engineers, or architects approved by the Earthquake and War Damage Commission for the insurance of buildings, machinery and plant against the risk of earthquake. The format of this certificate has been agreed with the Commission and completion of such forms are mandatory where the insurer wishes to carry the risk of "excess of indemnity". The completed valuations have to be approved by the Commission so that the levy as prescribed by the Act can be calculated on the indemnity sum shown in the valuation. The Insurer strikes a rate on the amount insured in excess of indemnity to establish a premium for the risk carried by them, known in the market as "Company Earthquake". An alternative is the insuring of the earthquake risk offshore but then the whole risk including indemnity would then be carried by the offshore insurer.

Presumably most members of the Institution of Professional Engineers are familiar with this certificate, its content and related procedure (see Appendix 1). Suffice to say that the figures required by the certificate include indemnity value, reinstatement estimate, (including additional costs as necessary to comply with any Act of Parliament or with by-laws of any Local Authority), estimated amount required to cover the cost of any demolition or shoring up of the building, inflationary provisions of the indemnity value anticipated during the period of insurance, and the estimated amount of inflation and reinstatement costs anticipated during both the period of insurance and the estimated reinstatement period. The certificate then is a very useful point of reference when setting limits of liability under the relevant insurance policy although the bases of settlement can differ from one policy to another. These invariably give the insurer the option to reimburse, repair, or reinstate. If the insured person elects not to rebuild where the property is damaged beyond repair, then the wording of the policy may see the basis of settlement revert to indemnity value. Occasionally there may be provision for reinstatement on another site or other form of "portability". It is important therefore to examine the special insurance wordings for earthquake damage as these can vary considerably within the insurance market.

I referred in the preceding paragraph to the additional costs necessary to comply with Local Authority requirements and I can sympathise with valuers and engineers when allowing for reinstatement to current codes particularly if completing a certificate for large buildings built in the 1960's, some of which I understand would require significant strengthening.

Claim Procedures

Before a claim can be considered by the Commission, the insurer must provide a certificate of currency on behalf of the

insured to the Commission. This can become a logistic problem in the event of a serious earthquake when many claims are made. No major problems were encountered by either insurers or the Commission following the Edgecumbe earthquake.

The Insurance Council, of which most insurers are members, has an Insurance Emergency Service Plan which is operable in the event of major catastrophes such as an earthquake but insurers still reserve the right to "go it alone" rather than be involved in a pooling of claims. The majority of insurance loss adjusters are independent contractors many of whom are experienced in handling disaster claims and are already "on call" to the Commission. Thus the assessing and adjusting resource has to be shared between the Commission and insurers in the event of earthquake. The practical solution is to agree dual appointments of such adjusters on property losses by insurers and the Commission recognising that there is the potential for a conflict of interest. This proved successful in every case except one following the Edgecumbe earthquake.

The Insurance Council emergency plan has operated successfully in recent times in the Thames, Coromandel and South Canterbury floods but it did not operate in the Southland floods of 1984; nor was it considered necessary for it to operate in the Edgecumbe earthquake, the majority of claims being made initially against the Commission. However all these disasters have highlighted the need for close co-ordination between the Commission, adjusters and insurers.

Whilst insurers may appoint valuers, quantity surveyors, engineers, architects, and other consultants to assist in the administering of a claim invariably it is the loss adjuster who appoints such specialists who in turn report to the loss adjuster.

THE ASSESSMENT AND UNDERWRITING OF THE EARTHQUAKE RISK TO PROPERTY, BOTH RESIDENTIAL AND COMMERCIAL

Until the demise of the Underwriters tariff in New Zealand 17 years ago, earthquake insurance was granted subject to rates, terms and conditions which were prescribed by the then Insurance Association, ie. a standardised approach was the norm. The rates built into the premiums were based on types of construction, eg. reinforced concrete or other, height of building, age (prior to 1940, 1940-1965, and after 1965) (see Appendix 2). The earthquake hazard was classified depending on whether the ground had been reclaimed or filled, whether foundations were set entirely in consolidated firm natural ground, or "least hazardous" where all foundations were set in hardbed rock. The rates then varied between .125% and .2% for dwellings and farm buildings; and between .1% and .5% for commercial buildings.

About 1978 the New Zealand insurance market became very soft. Currently rates for earthquake insurance vary between .1% and

.125% for commercial industrial risks whilst some of the larger ones may be rated as low as .07%. It is difficult to be specific regarding rates for retail and residential earthquake risks as generally these have been packaged to the detriment of sophisticated underwriting. No longer is a premium necessarily built up by separate rates based on the risks of fire, extraneous risks (such as wind, storm and flood), earthquake, burglary, breakage of glass etc, but tends to be based on an overall competitive rate.

Few insurers in New Zealand use earthquake survey reports to assess the seismic risk. However at least one company calls for detail on the structure, structural condition, height, pre-existing damage, whether walls are braced or not, and the condition of the foundations. A numerical rating scale is used in conjunction with the report to enable a justifiable rate to be struck.

The majority of New Zealand insurers appear to assume that the estimated loss per building as a result of an earthquake will be 100% of the sum insured in the absence of specialised information. This can only result in insurers considering their accumulation of earthquake risk on a very pessimistic basis. There is a need then for a more scientific approach not only in the selection, assessment, and rating of risks but also in assessing the estimated probable maximum loss following an earthquake. Such an improved practice may enable insurers to carry more of the earthquake risk than they do at present. Since the damage to particular buildings from earthquake varies according to building characteristics, it seems evident that insurers require professional advice on structural and earthquake engineering to enable them to improve the selection and assessment of such risks.

SOME LESSONS LEARNT BY DIRECT INSURERS IN THE EDGE CUMBE AND MEXICO EARTHQUAKES

The Edgecumbe earthquake brought home to many insurers that even a moderate earthquake such as 6.25 on the Richter scale can result in extensive property damage depending on the shallowness and focus of the epicentre and the intensity of ground shaking. Whilst that earthquake occurred in a thinly populated area there was a considerable degree of damage to domestic buildings involving some 6,000 claimants and 11,000 claims, several large commercial claims involving significant material damage and business interruption losses, and many uninsured losses. Much of the cost of the commercial and industrial claims is carried by reinsurance as the risk is spread by underwriters amongst professional reinsurers both in New Zealand and off-shore. Thus the cost effects of the Edgecumbe earthquake were felt as far away as New York, Geneva, Zurich, Munich, Copenhagen, London and Melbourne. The earthquake brought home to several insurers the need to closely examine policy wordings particularly those submitted by brokers on behalf of their clients where they were seeking a non-

standard wording to meet special requirements. It has emphasised the importance of having valuations of buildings and plant completed by specialists best qualified for that particular industry. It may be more practical to have qualified valuers estimate the indemnity value and to ask quantity surveyors and engineers to determine the estimated replacement cost. This may result in fuller insurance for our experience clearly indicates that actual reinstatement costs usually exceed those estimated at the time of effecting insurance even where due recognition has been made for escalation of costs during the insurance and rebuilding periods.

Then we were confronted by the so called Edgecumbe factor where certain builders and tradespeople faced with a heavy demand for their services, frequently loaded their hourly rates, often without justification.

As the bulk of the Edgecumbe claims were handled by the Earthquake and War Damage Commission, insurance companies were not put to the test of meeting tens if not hundreds of thousands of claims which they could be faced with should a more serious earthquake strike a heavily populated area such as Wellington.

The Mexico earthquake did not produce many lessons for New Zealand insurers as Mexico City is a special case with a sophisticated method of underwriting the seismic risk there (see Appendix 3). Unfortunately few of the insurance clientele in Mexico could afford to pay the additional premiums required to extend their fire policies to cover the earthquake risk. Total number of claims received by the Mexican insurers equated to those received by both the Commission and New Zealand insurers following the Edgecumbe earthquake. The many damaged and derelict buildings still standing in Mexico City are stark reminders that many of the owners were uninsured, or were insured and accepted cash settlements particularly as interest rates in the latter part of 1985 in Mexico were higher than the rate of inflation which certainly accelerated because of the earthquake. Furthermore there was no insurance cover provided for the cost of demolition and very little business interruption insurance was effected. The cost of those buildings still awaiting demolition will fall upon the State.

In New Zealand the Earthquake and War Damage Act does not provide for the cost of demolition. It is essential that insurers prevail upon their clientele, when requesting insurance protection in excess of the Act cover, to include the cost of demolition. Such costs vary considerably in the certificates of valuation. There is no differentiation of demolition costs whether as a result of fire or earthquake yet the costs of demolishing buildings and removing rubble are likely to escalate rapidly following a major earthquake and special consideration should be given when completing such certificates otherwise the insurance protection would be rapidly eroded. Picture the situation in Wellington with its concrete canyons,

narrow streets, limited access, and sparse demolition services. I feel sure that a "Wellington factor" would rapidly become apparent!

In fairness to the Commission, the insurers, reinsurers and loss adjusters, Edgecumbe earthquake claim payments were made promptly and apparently fairly. I have heard of no complaints to date from people who had adequate insurance protection.

The continuing lesson to be learnt by the public whether they be in New Zealand, Mexico or California, is that it is their choice to insure against the earthquake risk. Whilst the majority of New Zealanders are so insured, because of the way in which the Earthquake and War Damage Act is currently structured, a significant number of claimants still find themselves under-insured. Whilst most agree that California is more earthquake prone than New Zealand it is indicative to read that following the moderate size earthquake which occurred in Los Angeles in October 1987 and measured 5.9 on the Richter scale, there were 8,400 insurance claims which occurred with losses approaching US\$73 million yet insurable property damage was damaged to the extent of US\$358 million.

Earlier in this paper I referred to the earthquake project currently being undertaken by the US Insurance industry which not surprisingly has decided to concentrate on California and the exposure there to the seismic risk. Currently about 20% of residential structures are insured there against shaking damage and this incorporates a degree of adverse selection by the insuring population. Surprisingly only some 28% of commercial structures and contents are insured against ground shaking. It does seem that people everywhere have to be encouraged if not directed to protect themselves and their property whether it be from the risks of fire, earthquake, burglary, liability, or to adequately provide for superannuation. The problem, particularly in California, is that if everyone was to effect earthquake insurance there would be inadequate reinsurance to meet the demand. Some U.S. insurance companies say they would be seriously threatened without some involvement by the Federal Government. None of the figures referred to include losses from ensuing fires or business interruption or loss of rentals where incurred losses could easily absorb the sum insured.

RECOMMENDATIONS

1. Insurers must take the initiative and deal proactively with the problem of the seismic risk and the exposure thereof to their policyholders and shareholders. This problem could explode overnight. Recently the New Zealand media reported that Treasury were reviewing the future of the Earthquake and War Damage Commission and the contingent liability imposed on the consolidated account by the Act. No doubt the Earthquake and War Damage fund, currently standing at

around NZ\$1.6 billion also has its attractions, particularly to a Government embarked on a programme of privatisation. This in itself, should assist in reducing that contingent liability as State owned enterprises arrange for the insurance of their assets.

It is rather ironic that a liberal society such as California is currently debating the need for some Federal protection against the earthquake risk whilst here in New Zealand with its comparatively tiny population there are discussions afoot to terminate or progressively diminish the protection afforded to the insuring public of New Zealand for the past 40 years.

2. Insurers must manage the seismic risk (and that of fire following earthquake) by identifying building earthquake risk factors and their contents and business interruption risks preferably commencing with risk surveys. Whilst this in the main would have to be done initially by insurance company surveyors there should be scope for professional engineers to operate a bureau for such surveying, assessing not only the risk but also the damage following the earthquake.
3. Once the stock of buildings has been so surveyed, the risks must be scientifically assessed and either accepted or declined. The pricing of accepted risks must be based on a sophisticated scale which takes the actual seismic risk into account as it does in all other earthquake prone communities and not be left to the vagaries of an over competitive market. Risk sharing with the insured could be developed further by applying "deductibles" from losses incurred.
4. As insurers are wholly dependent on world reinsurers for protection in case of catastrophe such as a major earthquake it would be prudent to adopt a common methodology such as that propounded by G.R. Birss [1].
5. A building by building approach would then enable insurers to assess their aggregated maximum probable losses and thus greatly assist in negotiating reinsurance requirements. Internationally much work has already been done in the control, supervision and underwriting of the earthquake peril by a technical study group of international insurers and reinsurers under the name of CRESTA which stands for Catastrophe Risk Evaluating and Standardising Target Accumulations, the secretariat being run by Swiss Reinsurance Company in Zurich. In my research for this paper, I came across the name of Bruno Porro who is a member of the Seismological Society of America, the Earthquake Engineering Research Institute, and the New Zealand Society for Earthquake Engineering. He is leading the Catastrophe and Research Department of Swiss Re and I commend to you his article [2], particularly his comments on the price of earthquake cover.

6. Insurers here must also give more attention to the risk of fire following earthquake as our building stock contains many wooden buildings (as it does in San Francisco) whilst most modern buildings contain highly inflammable contents. We cannot rely on a continuation of fire protection following an earthquake for many water mains would be fractured, streets would be blocked with debris, and pressure could be lost thereby rendering many sprinkler systems ineffective.

The U.S. All-Industry Research Advisory Council, based in Illinois, released last year a report entitled "Fire. Following Earthquake" (estimates of the conflagration risk to insured property in greater Los Angeles and San Francisco) prepared by Dr. Charles Scawthorn. This is most comprehensive and I conclude from it that if the 1906 San Francisco earthquake occurred today that city would still be faced with a most serious conflagration risk, the cost of which could exceed the shake damage, somewhere between US\$4 to US\$15 billion in the San Francisco Bay area depending on wind conditions.

Dr. Scawthorn considers that the methodology as presented in his report is directly applicable and useable by insurance companies. Whilst obviously he is referring to American insurers I am sure much can be gleaned by us in New Zealand from the report which could assist us in determining our exposure to the risk of fire following earthquake. Again this aspect and that of the business interruption risk or consequential loss, can be included in the proposed building survey questionnaire.

7. We at Commercial Union in conjunction with a team of civil engineering advisers, have designed such a survey form so that a body of information can be obtained to evaluate a building's relative seismic risk. We readily appreciate that a more detailed assessment of the seismic risk would require the skills of a professional engineer. However such a form will assist us to build a database and from this we will re-assess our maximum probable loss and exposure to claims. It would be prudent to fully computerise such a database so that our exposure can be updated and reviewed regularly.

8. Not only insurers, but all parties likely to be involved in a major earthquake including loss adjusters, valuers, quantity surveyors, engineers, architects, builders, demolition contractors, should establish closer relationships with Civil Defence and Local Authorities to improve disaster planning. Such parties should be represented through their National Associations on any National Committee for Disaster Planning or Civil Defence. Perhaps professional engineers could consider embarking on scenario planning in consultation with the appropriate bodies with a view to advising a

committee such as the one set up in Mexico in 1985 for reconstruction and recovery. There, considerable pressure was placed on engineers not to write-off buildings as was their first inclination but to seek ways and means of saving as much of the damaged property as possible.

CONCLUDING REMARKS

One thing is clear, there will be a considerable shortage of resources in most areas and we would require considerable assistance from overseas. Full insurance either by way of the Earthquake and War Damage Act and/or by direct insurers, supported by worldwide reinsurers, will certainly not provide the answer to such devastation. It will only provide some of the funds necessary to reconstruct. As we know it is not a matter of "if" but "when" and it is incumbent upon us all - Government, business people, and property owners - to seriously plan to manage such a disaster.

ACKNOWLEDGEMENT

The author is indebted to MunichRE NZ Services Ltd for the extract from their publication entitled "Earthquake Mexico '85" that is included as Appendix 3.

REFERENCES

1. Birss, G.R., "Methodology for the Assessment of the Damage Cost Resulting from a Large Earthquake in the vicinity of Wellington", NZNSEE Bulletin, vol. 18, no. 3, September 1985,
2. Porro, B., "Earthquake Assessment - What Can We Do", Journal of the Insurance Institute of New Zealand, September 1986

APPENDIX 1

VALUATION FOR INSURANCE PURPOSES (BUILDING)

- 1. Name of Insured
- 2. Address of Building to be Insured (including street number)
- 3. Type of Occupancy
- 4. Brief Details of Construction
- 5. Age of Building

A. CERTIFICATE OF INDEMNITY VALUE

In compliance with the requirements of the Earthquake and War Damage Act I hereby certify that the "INDEMNITY VALUE" of the Insured Building is

\$

(Important—before applying depreciation the Valuer should include all fees as defined overleaf—Note 1)

Valuer's Signature Qualification

Date

Name of Valuer and Firm

Name of Insurance Company

Policy No. Period of Policy is from to

B. REINSTATEMENT ESTIMATE (See Note 3 overleaf)

The estimated cost of rebuilding the property at the level of costs applying at the inception of the current period of insurance ignoring the inflationary factors which may operate subsequent thereto including the use of currently equivalent building materials and techniques and such additional costs as necessary to comply with any Act of Parliament or any Regulation under or framed in pursuance of any such Act or with By-Laws of any Municipal or Local Authority (inclusive of all fees as defined overleaf—Note 1).

\$

Note (i) If the reinstatement estimate is based upon the use of different materials and/or additional services from those existing, briefly describe them

Note (ii) By what amounts do the considerations referred to in Note (i) increase the Reinstatement Cost? \$

Note (iii) What amount of additional costs necessary to comply with any Regulation or By-Law requirement has been included in the Reinstatement Estimate? \$

Note (iv) Are there any Regulations preventing reinstatement wholly or in part? If so give brief details —

C. DEMOLITION

What is the estimated amount required to cover the cost of any Demolition Shoring up or Propping of the building damaged or destroyed and the Removal of Debris including Contents whether damaged or not

\$

D. INFLATIONARY PROVISION

(i) Indemnity (as defined in A above)

The estimated amount of inflation in "Indemnity Value" anticipated during the period of insurance only is

..... S

(ii) Reinstatement (as defined in B above)

The estimated amount of inflation in costs anticipated during both the period of Insurance and the estimated reinstatement period taking into consideration time required for damage inspections, demolition, preparation of new preliminary proposals and their approval, preparation of working drawings and specifications, schedule of quantities, obtaining City Council approval tenders etc. is

..... S

Estimates under B, C and D are given without prejudice.

SIGNATURE DATE

Name of Valuer and Firm

4/86

NOTES:

1. FEES

These are to include Architects' Surveyors' Consulting Engineers' and other fees for estimates, plans, specifications, quantities and tenders and supervision necessarily incurred in the reinstatement consequent on destruction of or damage to the property insured but not such fees for preparing any claim under the policy.

2. EARTHQUAKE AND WAR DAMAGE ACT

Under a Reinstatement Policy the Earthquake and War Damage Act provides a means whereby the Earthquake and War Damage premium may be charged on the certified indemnity value only which then becomes the maximum liability of the Commission.

In order to receive this concession the following procedure must be followed:—

At the commencement of each period of Insurance a certificate stating the INDEMNITY VALUE must be submitted to the Commission. This certificate is to be furnished by a Valuer who must be a registered member of N.Z. Institute of Architects, a Valuer registered under the Valuers Act 1948, an Engineer registered under the Engineers Registration Act 1924 or a Quantity Surveyor registered under the Quantity Surveyors Act 1963.

3. "REINSTATEMENT" SHALL MEAN BUILDINGS

(a) Where destroyed, the rebuilding of the property including the use of currently equivalent building materials and techniques and such additional costs necessary to comply with any Act of Parliament or any Regulations under or framed in pursuance of any such Act or with By-Laws of any Municipal or Local Authority.

(b) Where damaged, the restoration of the damaged portion of the property to a condition substantially the same as but not better or more extensive than its condition when new but including such additional costs necessary to comply with any Act of Parliament or any Regulations under or framed in pursuance of any such Act or with By-Laws of any such Act or with By-Laws of any Municipal or Local Authority.

PROPERTY OTHER THAN BUILDINGS

The restoration of the damaged property to a condition substantially the same as but not better or more extensive than its condition when new or if destroyed its replacement by similar property in a condition substantially the same as but not better than the condition of the insured property when new.

APPENDIX 2

1. RATES

Earthquake insurance may be granted at the following rates and subject to the terms and conditions as set out hereunder :-

CLASS	CONSTRUCTION OF BUILDINGS	Extra Hazardous	Hazardous	Least Hazardous
	<u>Buildings and Contents</u>	Reclaimed or filled ground	All foundations set entirely in consolidated firm natural ground	All foundations set entirely in hard bed-rock or Granite and certified to the satisfaction of individual Member Companies
1.	DWELLINGS & FARM BUILDINGS of any material not exceeding 2 storeys.	.200	.150	.125
2.	Buildings of one storey of any material other than brick or concrete.	.250	.200	.150
3.	REINFORCED CONCRETE Earthquake resistant Buildings not exceeding 6 storeys and constructed			
	(a) Prior to 1940	.250	.200	.150
	(b) 1940 to 1965	.200	.150	.125
	(c) after 1965	.175	.125	.100
4.	REINFORCED CONCRETE Earthquake resistant Buildings exceeding 6 storeys and constructed			
	(a) prior to 1940	.400	.325	.225
	(b) 1940 to 1965	.375	.300	.200
	(c) after 1965	.325	.250	.150
5.	Buildings not provided for under 1,2,3 or 4 above and constructed			
	(a) prior to 1940	.500	.425	.275
	(b) 1940 to 1965	.450	.350	.225
	(c) After 1965	.375	.275	.175

+12½%

NOTES :-

1. Buildings comprising more than one of the above classifications to be charged the highest rate applicable.
2. No greater cover to be granted than the amount of Fire Insurance.
3. No commission is payable on Earthquake Insurances.
4. Where Rent is insured the excess shall not apply to the Rent Item.
5. Where Earthquake (Fire and/or Shock) is covered under a Loss of Profits Policy, the excess shall not apply under the Loss of Profits Insurance.
6. Where cover is granted under Regulations 46 or 46A for Demolition or Removal of Debris the excess shall not apply.
7. Superstructures and Penthouses may be ignored in interpreting Number of Storeys.
8. It is recommended that the certification under the "Least Hazardous" classification should be given by a geologist.

2. ENDORSEMENTS

(a) (1) In consideration of the payment by the Insured of the sum of \$..... additional premium, the Company agrees, notwithstanding what is stated in the printed conditions of this Policy to the contrary, that this insurance covers loss or damage by fire to any of the property insured by this Policy occasioned by or through or in consequence of earthquake and/or loss or damage to any of the property insured directly caused by earthquake.

It is declared and agreed that in the event of loss or damage to the property insured directly caused by earthquake, this Company shall be liable to pay or contribute in respect of such loss or damage its proportion only of the amount by which such loss or damage shall exceed \$100 during any period of 48 consecutive hours, but this condition does not apply to loss or damage by fire caused by earthquake.

If Fire Policy not subject to Average.

The \$100 above referred to shall apply to any one building or group of buildings or contents in the same ownership, located in one situation whether insured with one or more insurers.

It is further declared and agreed that in the event of loss or damage by fire occasioned by or through or in consequence of earthquake, or of loss or damage directly caused by earthquake, this Company shall not be liable to pay or contribute in respect of such loss or damage beyond the proportion which the sum insured against the risks covered by this endorsement shall bear to the total insurance against ordinary fire loss.

Provided further that this insurance shall be subject to the terms, provisions and conditions, other than Condition 17, of this Policy so far as they are applicable.

If Fire Policy subject to Average.

Same as above, except that third paragraph be deleted and words "other than Condition 17" be omitted from last paragraph.

APPENDIX 3

Direct insurance and reinsurance of the earthquake risk in Mexico

Terms, conditions and rates

Like the US and Canadian fire policies, the Mexican fire policy does not exclude earthquake, thus automatically covering the fire risk as a result of earthquake without applying any restrictions such as deductibles, etc.

The earthquake shock risk may be included in the policy by way of a supplement and payment of a premium loading. Consequential loss policies are subject to a market agreement specifying that earthquake shock coverage is granted only for fixed operating expenditure and not for the actual loss of profits.

Earthquake shock coverage is provided under the following uniform conditions throughout the Mexican market:

- Application of the full value principle (with underinsurance clause).
- Application fo a 25 per cent coinsurance borne by the policyholder (proportional share in losses).
- Application of a sum insured of 75 per cent of the regular sum insured in fire (an additional limit of liability being applied by the "coaseguro convenido" in a few cases).
- Application of a deductible of 2 per cent of the sum insured in earthquake (= 1.5 per cent of the sum insured in fire) without limitation of the maximum amount.

The Mexican earthquake tariff subdivides the country into 7 exposure zones:

- Zone 0: low exposure
- Zone 1: moderate exposure
- Zone 2: high exposure
- Zone 3: very high exposure
- Zone T: transition zone (Mexico City only)
- Zone C: soft sediments (Mexico City only)
- Zone R: soft sediments (Acapulco only)

ANEXO CIRCULAR No. S-340

***ENDOSO DE TERREMOTO Y ERUPCION VOLCANICA**

POLIZA DE INCENDIO

CLAUSULA 1a.—RIESGOS CUBIERTOS.—Los bienes amparados por la póliza a la cual se adhiere este endoso, quedan también cubiertos contra daños materiales causados directamente por Terremoto o por Erupción Volcánica.

Si los bienes mencionados o parte de ellos fueren destruidos o dañados dentro de la vigencia del seguro consignada en la póliza, la Compañía conviene en indemnizar al Asegurado el importe de los daños sufridos de conformidad con la Cláusula Cuarta del presente endoso y demás relativas sin incluir el valor de mejoras (exigidas o no por autoridades) para dar mayor solidez al edificio o edificios afectados o para otros fines, en exceso de aquellos reparaciones necesarias para reponer los bienes al mismo estado en que se encontraban al momento del siniestro.

Los daños amparados por este endoso que ocasionen algún terremoto o erupción volcánica darán origen a una reclamación separada por cada uno de esos fenómenos; pero si varios de éstos ocurren dentro de cualquier período de 72 horas consecutivas durante la vigencia de aquél, se tendrán como un solo siniestro y los daños que causen deberán ser comprendidos en una sola reclamación.

CLAUSULA 2a.—BIENES EXCLUIDOS PERO QUE PUEDEN SER CUBIERTOS MEDIANTE CONVENIO EXPRESO.—Salvo convenio expreso, esta Compañía no será responsable por daños de los que cubre este endoso:

- a) A albercas, bardas, patios exteriores, escaleras exteriores y cualesquiera otras construcciones separadas del edificio o edificios o construcciones que expresamente estén aseguradas por la póliza a la cual se agrega este endoso.

CLAUSULA 3a.—BIENES Y RIESGOS EXCLUIDOS QUE NO PUEDEN SER CUBIERTOS.—Esta Compañía en ningún caso será responsable por daños a que este endoso se refiere:

- a) A cimientos y muros de contención debajo del nivel del piso más bajo, a muros de contención independientes y a suelos y terreno.
- b) A cualquier clase de frescos o murales que como motivo de decoración o de ornamentación estén pintados en o formen parte del edificio o edificios o construcciones aseguradas.
- c) Causados directa o indirectamente, próximo o remotamente por reacciones nucleares, radiaciones o contaminaciones radioactivas, ya sean controladas o no y sean o no como consecuencia de terremoto o de erupción volcánica.
- d) Por marejada o inundación aunque éstas fueren originadas por alguno de los peligros contra los cuales ampara este seguro.

*C. N. B. S. / CIRC. S. 299. —16/XI/72 221 1/982.—23/XI/72

e) Causados por vibraciones o movimientos naturales del subsuelo que sean ajenos al terremoto, tales como hundimientos, desplazamientos y asentamientos normales no repentinos.

CLAUSULA 4a.—CONTRIBUCION DEL ASEGURADO.—Es condición básica para el otorgamiento de la cobertura establecida en este endoso que el asegurado soporte por su propia cuenta un mínimo de 25% de toda pérdida o daño que sobrevenga a los bienes asegurados por terremoto o erupción volcánica. En caso de tener aplicación la Cláusula 4a. de las Condiciones Generales de la póliza, en virtud de que al ocurrir el siniestro los bienes asegurados tengan un valor superior al declarado, la indemnización se reducirá proporcionalmente.

Dada la participación de pérdida a cargo del asegurado, la prima se calculará en un 75% del valor declarado de los bienes asegurados contra incendio.

De existir otros seguros, la indemnización quedará limitada a la proporción que en el 75% de la pérdida o daño corresponda a esta póliza en el total de seguros vigentes.

CLAUSULA 5a.—DEDUCIBLE.—En cada reclamación por daños materiales a los edificios, construcciones o contenidos amparados por este endoso, se aplicará un deducible del 2% sobre la suma asegurada de temblor, la cual equivale al 75% del valor declarado para el seguro de incendio. Este deducible se aplicará, después de haber restado la participación del asegurado.

Si el seguro comprende dos o más incisos o cubre bajo cualquier inciso dos o más edificios, construcciones o sus contenidos, el deducible se aplicará separadamente con respecto a cada inciso y en su caso con respecto a cada edificio, construcción y/o sus contenidos.

CONDICIONES ESPECIALES PARA LA COBERTURA DE TERREMOTO O ERUPCION VOLCANICA QUE SE AGREGAN AL TEXTO DE ESPECIFICACIONES QUE FORMA PARTE DE LA POLIZA No.

(PERDIDA DE UTILIDADES)

Es condición expresa de la póliza que, si la causa de la pérdida amparada por la misma es atribuible al riesgo de Terremoto o Erupción Volcánica, operará en todo caso, una participación a cargo del asegurado de un 25% sobre el monto total de la pérdida y un deducible del 2% sobre la suma asegurada fijada de acuerdo con el período o porcentaje cubierto por la misma. Este deducible se aplicará, después de haber restado la participación del asegurado.

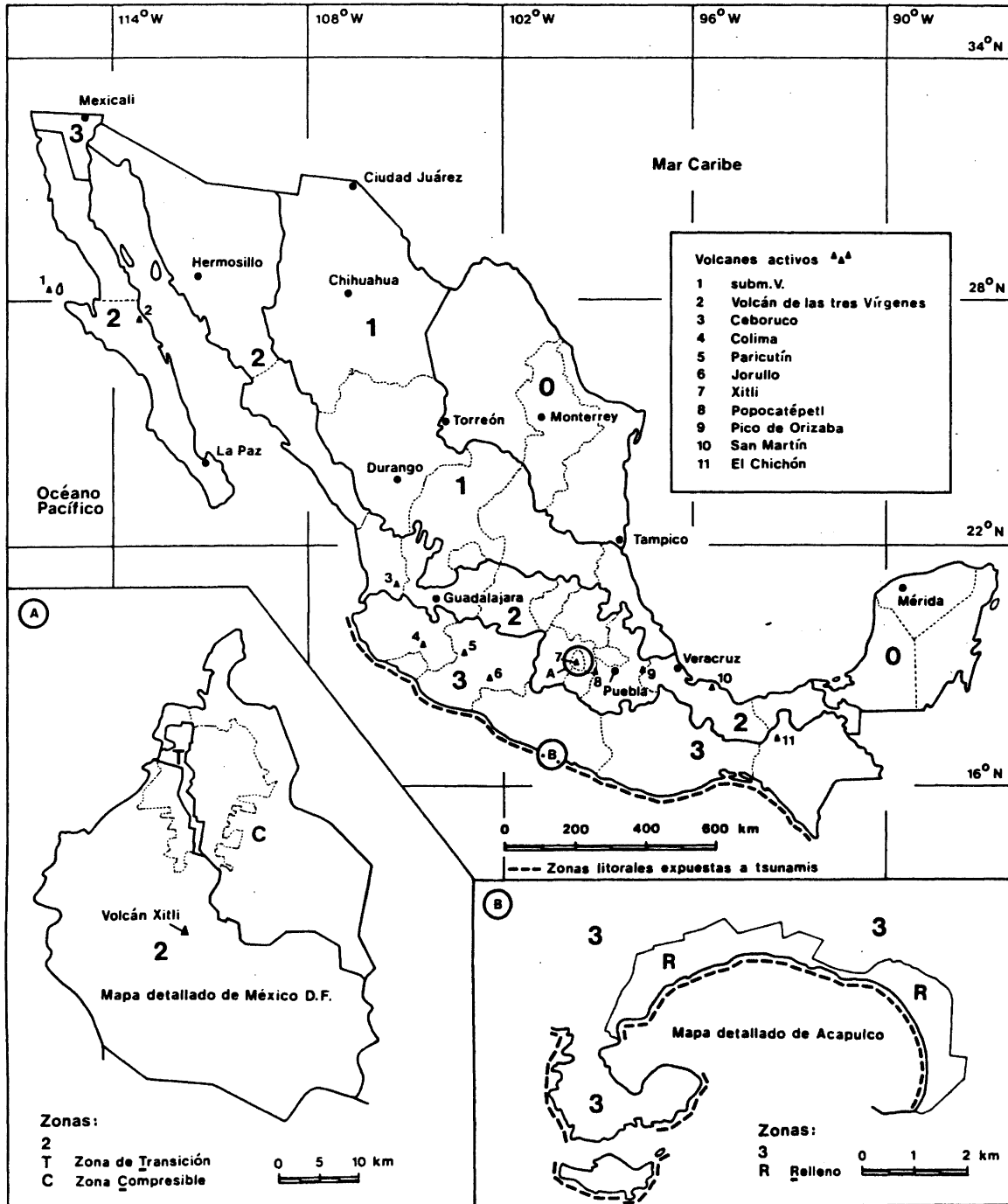
En caso de que el importe de las utilidades que sirvan de base para fijar la indemnización sea superior al declarado, la indemnización se reducirá de acuerdo con las "Cláusulas Proporcionales" correspondientes.

Dada la participación de pérdida a cargo del asegurado, la prima se calculará en un 75% del valor declarado para efectos de seguro.

De existir otros seguros, la indemnización quedará limitada a la proporción que en el 75% de la pérdida corresponda a esta póliza en el total de seguros vigentes.

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Zonas Expuestas a Terremoto, México
 (Zonificación según la Tarifa Mexicana de Incendios)



Construction class	Basic premium in per mille							Multiplying factor applied to basic premium											
								Construction			Height			Standard			Design		
	Tariff zone							symmetrical	semi-symmetrical	asymmetrical	1-6 floors	7-11 floors	12 floors plus	industry	normal	luxury	antiseismic	not antiseismic	
	0	1	2	3	T	C	R												
I	0.20	0.40	0.80	1.60	1.07	1.07	2.13	1	1.15	1.30	1	1.15	1.30	1	1.15	1.30	0.75	1	
Ia, II	0.27	0.53	1.07	2.13	1.60	2.13	2.66	1	1.15	1.30	1	1.15	1.30	1	1.15	1.30	0.75	1	
III, V	0.27	0.53	1.07	2.13	2.13	2.13	2.66	1	1.15	1.30	1	1.15	1.30	1	1.15	1.30	0.75	1	
IIa, IV, VI	0.33	0.67	1.33	2.66	2.66	2.66	2.66	1	1.15	1.30	1	1.15	1.30	1	1.15	1.30	0.75	1	
VII	0.20	0.40	0.80	1.60	1.60	2.13	2.13	1	1.15	1.30	1	1.15	1.30	1	1.15	1.30	0.75	1	
VIII	0.33	0.67	1.33	2.66	2.66	5.33	5.33	1	1.15	1.30	1	1.15	1.30	1	1.15	1.30	0.75	1	

The earthquake premium also depends on the type of construction, the number of floors and other criteria relevant to the risk.

The tariff no longer provides for the application of "cuotas específicas", i.e. tariff deviations applied, for example, quite often in fire insurance.

It would appear absolutely essential to revise the current tariff, including the most recent experience. The tariff thus revised should specify – substantial – premium increases for some risk categories, in particular for high-rise buildings with a critical resonance frequency in zone C of Mexico City.

Accumulation control

Earthquake liability accumulations must be constantly monitored to allow a well-founded assessment of the loss potential. After recognizing the vital importance of accumulation control years ago, Mexican insurers and their international reinsurers agreed that the Mexican Insurance Association AMIS should provide such control centrally for all companies in the market. So far covers have been subdivided by 18 accumulation assessment zones and, for each zone, by 44 types of risks depending, for example, on the type of construction and number of floors. A simplified accumulation control form is shown below. The liabilities shown must generally comply with the total liabilities in force at the date indicated and must not under any circumstances represent, say, the insurance covers written in the last 12 months.