



## Energy Market Review WILLIS

### Market Overview

The casual observer of the market could be forgiven for thinking that it must be a good time to be an energy underwriter: sky-rocketing rates, tightening of terms and conditions, the withdrawal of weaker competitors and a tricky treaty renewal season successfully concluded would all seem to point to a market now back on track for a speedy recovery from the horrors of the past few years.

Indeed, as so often happens in a hard market, the most important element of all – luck – is now going the market's way as well. Up to the beginning of May there had only been 3 losses in 2002 excess of US\$50 million of which we are aware:

	Estimated US\$ Million
Gas Plant Fire, Kuwait	150
Refinery Fire, Japan	75
Power Station Flood, USA	70

For the same period last year there were six incidents, five of which were in the US\$100 million+ range. An updated comparison table similar to that contained in the November 2001 issue is as follows:

### Claims excess of US\$ 50 Million for January – April (Not including third party liability)

Year	Number	Total US\$
1998	2	110,000,000
1999	7	950,000,000
2000	3	440,000,000
2001	6	1,350,000,000
2002	3	300,000,000

In 2001 there were a total of 11 property losses in excess of US\$50 million, currently reserved at US\$2.669 billion (although on a combined property and liability basis the Toulouse loss alone is estimated to be in excess of US\$2 billion, of which an estimated US\$1.5 billion is third party liability, half of which is uninsured).

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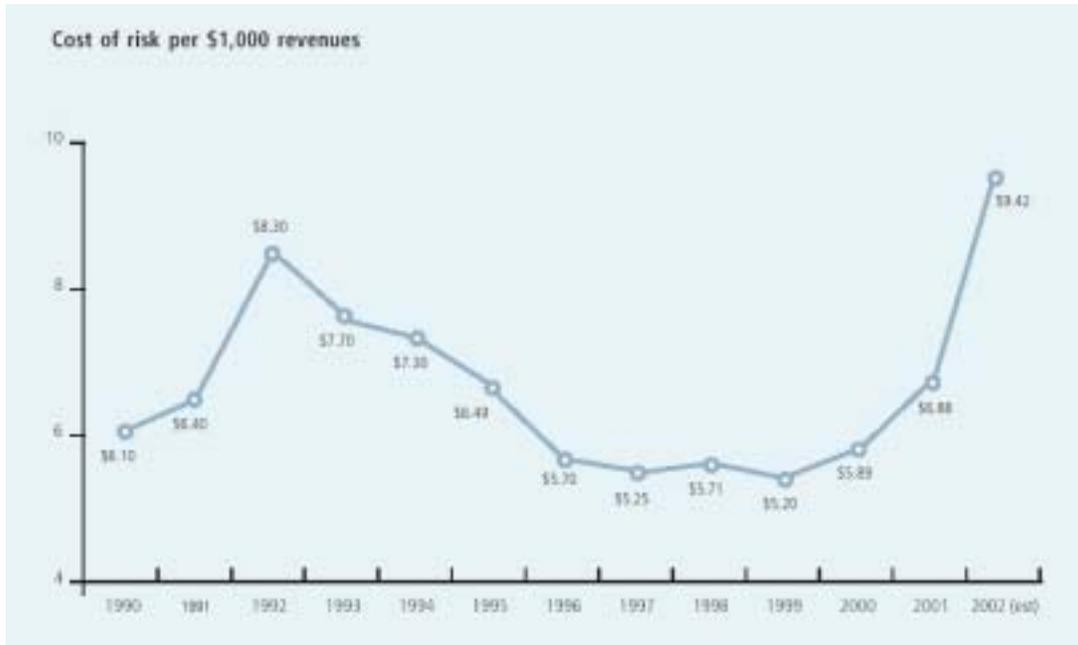
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The general view among loss adjusters now is that there is a reduction in the number of claims being reported, and this is probably a reflection of generally increased levels of self-insured retention forced on insureds by the market.

With underwriters benefiting both from luck (reduced severity) and the re-underwriting of their book (reduced frequency) there would seem to be cause for at least a degree of satisfaction, if not for outright celebration.

**Why then are there so many worried faces in the market?**

The following graphic goes some way to providing an explanation:



As can be seen, despite rapidly increasing rates throughout 2001, estimated premium for the year is unlikely to cover more than 50 per cent of final losses. Whilst this does not reflect the effect of rate and self-insured retention increases since the beginning of 2002 it is clear that, if the loss record this year takes a sudden turn for the worse, despite increased rates and retentions, 2002 could easily be another unprofitable year.

In 2001 there was an exceptional frequency of catastrophically large losses, where increased retentions would have had little effect on overall insured losses. For many established energy underwriters this is their final chance to get it right, and further loss will not be tolerated by their capital providers.

But this is only part of a worrying picture emerging for established energy underwriters.

New capacity has poured into the market, both into new insurers, particularly in Bermuda, and also into traditional areas such as Lloyd's, thus providing unwelcome competition at a time when the cost of capital has meant that every risk written must be justified to management by the underwriter. In addition to this the establishment on May 1, 2002 of the Oil Insurance Limited sister mutual sEnergy may well prove to be hugely significant in determining the future of the energy market. The combination of OIL and sEnergy providing both physical damage and business interruption coverage means that for the first time a complete mutual alternative to the commercial market is a reality, and, this being the case, many traditional energy insurers may find the way out of the woods blocked for good.

## Market Updates >> Onshore Property

Undoubtedly the onshore market is hard in comparison to one year ago, but can it really be considered "hard" in the traditional sense? Premiums are not so high and terms and conditions are not so restrictive as ten years ago when the last hard market was experienced. For the big petrochemical and refining risks "utilisable" capacity is probably now more plentiful, though it is concentrated in fewer hands. What would appear to have happened is that there has been a technical correction – albeit a major one – and the uneven process of adjustment is continuing.

## Capacity

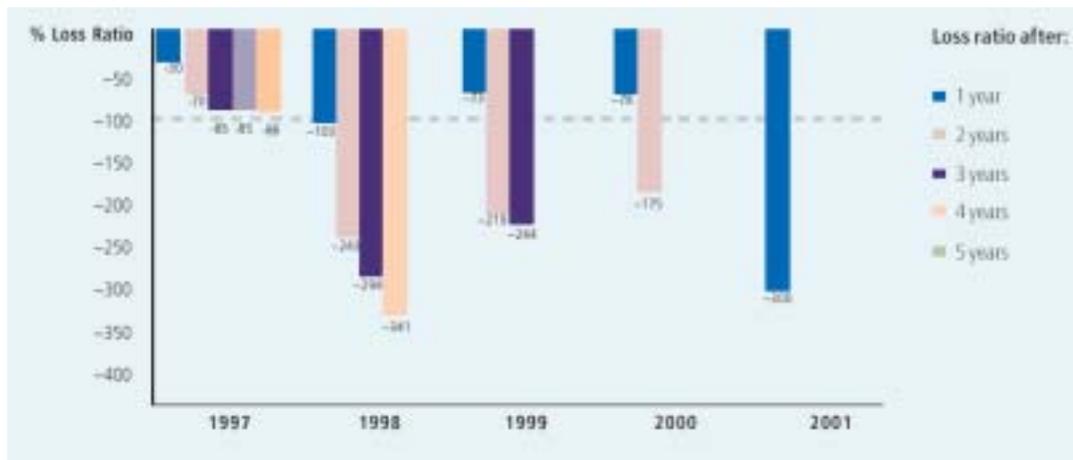
– There has been a significant increase in utilizable capacity since the beginning of the year, and particularly since the nadir for capacity in November 2001.

By "utilisable" we mean capacity that is economically viable to use, being considerably less than the sum total of the published capacity of worldwide insurers.

– We estimate utilisable global onshore capacity by US\$1.2 billion for international risks. This is exclusive of OIL and sEnergy which add another US\$250 million physical damage and US\$200 million business interruption respectively.

– Capacity of at least US\$700 million excess of the above is possible, but at a price.

## Onshore Energy Physical Damage: loss ratio development



– The face of the market is changing rapidly as old players disappear and new capital makes its entrance

– Fewer players control more capacity This means less choice for buyers.

– To maximise capacity it is often necessary to carefully structure programs by combining quota share limits with layers.

## Cost

– Rates have continued to increase throughout the year and, whilst the rate no signs of leveling out. This is quite understandable given that loss levels of recent years indicate that rates still have a long way to go, unless there is a dramatic improvement in loss frequency and greater focus on preventative maintenance. The higher retentions being imposed should help here.

– There has been considerable variation in approach to pricing between the two main sectors of the onshore market.

"Technical" insurers are concerned that the technical rate for the risk is achieved, but "commodity" underwriters will auction their capacity to the highest bidder. Single site risks in particular have seen radical rate increases.

– Underwriters do not expect to realize all the necessary rate increase at once, and recognise that too much too quickly will lead to the better business looking for alternative solutions.

Therefore, in order to avoid attritional losses, there has been a concerted effort to raise deductibles. The normal minimum waiting period for business interruption is now 45 days, and for larger risks it is as high as 60.

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– Business interruption valuation has emerged as a key issue, particularly with regard to refining risks where recent losses in 2001 showed BI values to be seriously under-reported. However, attempts by some insurers to impose average daily value caps, or similar, to restrict coverage to the values reported have been, by and large, successfully rebuffed.

### **Coverage**

All areas of coverage are under intense scrutiny by underwriters. Forms continue to be reviewed in depth, and it is more difficult to get manuscript wordings agreed. The following problem areas remain as in 2001:

- Clarification of coverage intent is universally required for cyber risks.
- Contingent business interruption is a big concern. Unnamed customer and supplier sub limits are at best much reduced and in many cases not available.
- Construction sublimits are also much reduced, and advance loss of profits/ delay in start-up (ALOP) is generally excluded.
- Some underwriters now require a sub limit for boiler explosion and machinery breakdown coverage.
- Terrorism is universally excluded.

A specialized but vibrant market has emerged offering stand-alone terrorism coverage, and this is described in a separate market update section of this Review.

### **Competition**

To the headings of Capacity, Cost and Coverage we can perhaps add one more:

Competition to the commercial market from the combination of the oil industry mutuals OIL and sEnergy providing physical damage and business interruption coverage could change the face of the market:

- sEnergy responds to a need which the market has been unable to address adequately. Not only can it provide US\$200 million of business interruption but it also includes other time element coverages such as contingent business interruption and terrorism without sublimit.
- Mutuals provide transparency of pricing. The OIL formula is for this reason very attractive to many clients, though sEnergy's use of a similar formula for rating business interruption on modified gross assets is certainly a radical departure from generally accepted underwriting norms, and it will be interesting to see how it works.
- Fear of the competition from these mutuals has meant that some underwriters have threatened not to write OIL wrap-arounds, or will give no credit for OIL as underlying coverage.

Many more do not want to be seen to be supporting sEnergy in its infancy.

It should be noted, however, that sEnergy wrap-around and excess programs have already been placed in the commercial market including participation from all major onshore insurers.

- Although sEnergy is not the immediate threat that the market feared (there are only 12 founding members) it is already adding a new dynamic to placing risks in the onshore market. The leverage provided by this alternative market may well curb the excesses of the "commodity" underwriters by reducing orders to the commercial market and thereby restricting participation to those insurers who take a technical (and more logical, and therefore more acceptable) approach to underwriting.

OIL is already well established, but if sEnergy is also successful then there is a very real threat to the future of some sectors of the onshore market.

### **Outlook**

Much depends on the onshore sector's loss record in 2002. In the absence of further losses there may be some residual hardening of the market; with moderate losses there will be continued meaningful hardening; and with dramatic losses there is a possibility of severely reduced capacity.

We believe that this view still holds true. But what is perhaps more significant is the distribution of those losses, and the critical importance of this in determining the future size and shape of the onshore energy market. The market is changing and the arrival of new competition means that established onshore insurers must adapt or withdraw from the energy sector altogether. As the comments of the astonished underwriter dramatically show, there is no room for either arrogance or complacency.

### **Market Updates >> Upstream Energy**

The general insurance environment would appear to be more stable and less uncertain.

Underwriters have largely reacted in a more measured fashion than in the last hard market. Generally, we have seen a more rational approach to the application of rate rises. Underwriters have paid closer attention to classes of business such as Control of Well and CAR than last time around, when blanket rate increases were imposed on all types of risk whatever the class. The marketplace has changed however, and many losses that have been incurred have yet to be paid. The resilience of underwriters and their financial backers is yet to be truly tested.

A saving grace for the industry is the fact that oil prices have remained at relatively high levels. This, along with a general recognition that rates had to rise, has led to a level of resilience to increased premiums among upstream clients.

It has also led to a sustained drilling and construction boom, which continues to fuel the market with premium, thereby improving liquidity.

The market cannot be complacent though as clients are responding to increased premiums in various ways in order to stabilise both cost and coverage.

The best illustration of this is that as we write, membership of OIL stands at 74 companies. Of this number no less than 37 have signed up since January 2001.

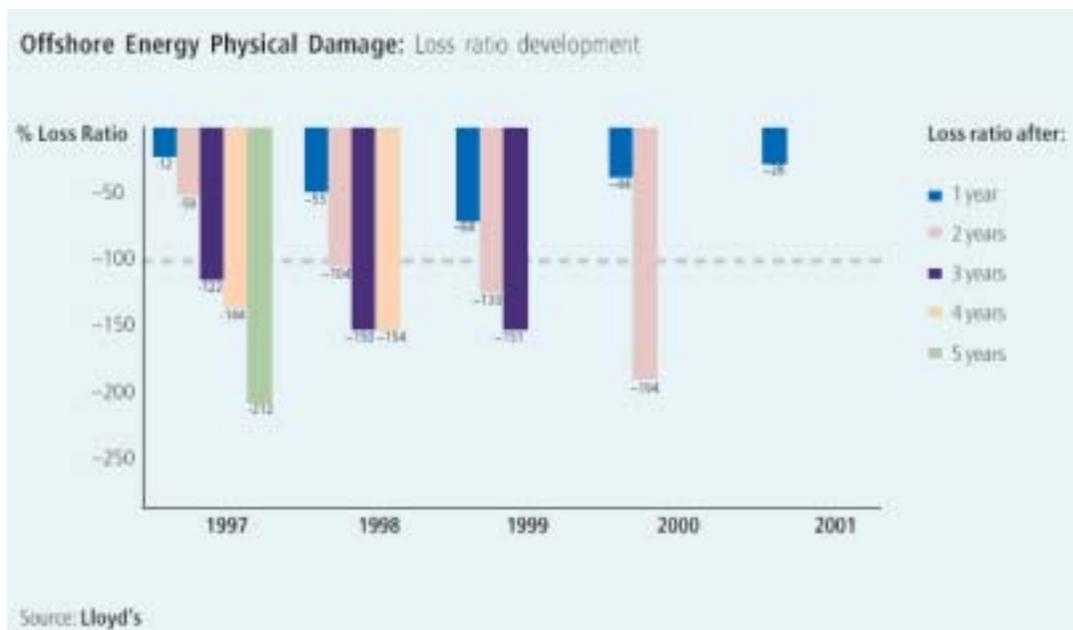
Whilst many of the new members are not upstream clients, this should, nevertheless, be a disturbing statistic for underwriters. In a volatile risk class the last thing the market needs is a reducing customer base as this can only exacerbate the boom bust cycle of the class.

The success of OIL in conjunction with the merger mania of the past few years may yet become the biggest challenge faced by the market.

As in any economic equation the fundamentals are simple. The market is built to support the largest risks (which may exceed US\$2 billion) yet the average risk may only be US\$20 million. The consequent supply and demand imbalance makes it impossible for the market to write a balanced portfolio.

Take away a significant proportion of the client base through merger, self insurance or OIL membership and the result can only be increased volatility.

Capacity is of course price elastic and other underwriters may be attracted to certain risks either through pricing or for other reasons such as the domicile of a risk.



By and large, the pre-September 11 market place has continued intact in this sector although some insurers' capacities have reduced. In addition, some welcome additions to Upstream Energy market capacity in the form of Ascot, Axis, and the increased profile of Brit and MAP.

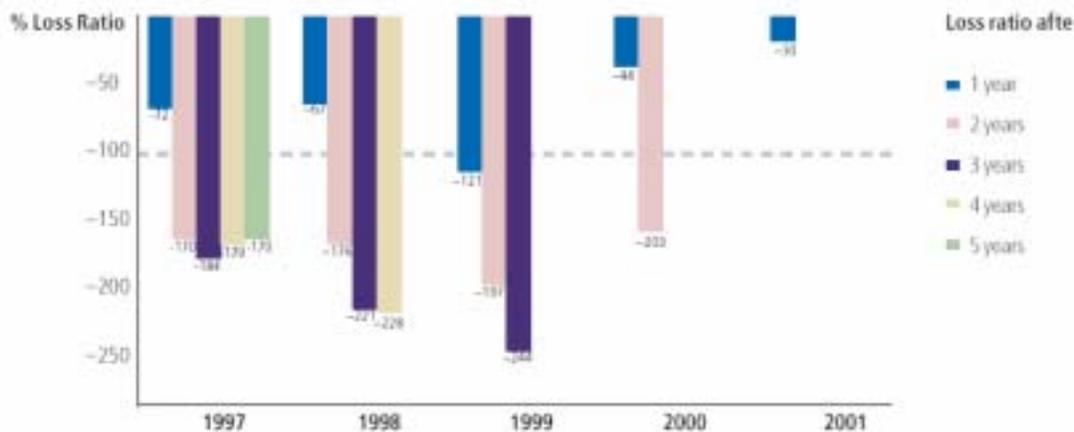
However, Axis apart, the new Bermudan capacity is not writing Upstream business and has therefore yet to make an impact in the market. As with the onshore market there is also "commodity" capacity that has not been included in our review of normal market capacities.

The various classes of the Upstream Energy sector merit individual commentary.

### Operating Risks

Absent losses, those accounts that have already had a post September 11 renewal are unlikely to witness further significant change. Indeed, there are underwriters who would venture privately that some of the early renewals may have seen an overreaction owing to the general level of uncertainty leading up to their own treaty renewals.

## Energy Control of Well: Loss ratio development



Source: Lloyd's

The jury is out on treatment of these programs as they come up for renewal.

Stand alone Control of Well can be ring fenced from these comments and remains a difficult and unpopular class, as are some smaller contractor programs.

### Construction Risks (CAR)

Whilst a few more underwriters are beginning to write construction, the predominance of capacity remains in Lloyd's and the sheer volume of business has unbalanced a number of underwriters' portfolios. We are already witnessing a scaling back of lines due to premium income issues and we fully expect this trend to continue in the latter part of the year.

Whilst these are only proposals, if implemented they would have a dramatic effect on Lloyd's ability to commit capacity to anything but the shortest of projects.

More generally, whilst a few projects have been placed with alternative leads, the majority of CAR business remains led by Wellington. Rates, and more particularly deductibles, continue to rise. Whilst many orders are often for less than 100 per cent, where 100 per cent coverage is required, deductibles have to rise significantly to achieve completion of the placement.

The underwriting community should be concerned by the progressive change in contracting philosophy. As more clients have become familiar with the WELCAR policy form (which is gaining general acceptance amongst underwriters), the more restrictive coverage it provides compared to the old forms has necessitated a change in the contracting stance of the industry, particularly with respect to quality assurance/quality control provisions.

Some companies such as BP (and consequently their partners) have gone further and effectively de-linked the necessity for provision of insurance cover from their contracts by electing to self insure.

This factor along with increased deductibles has led to an ever-increasing number of buyers (particularly OIL members) to question the need to purchase CAR cover at all. A similar picture is true for CAR liabilities where a combination of cover and cost issues are driving more clients to rely upon their corporate liability programs. When the requirement to insure was built into the construction contracts, the corporate liability program could not be relied upon because corporate programs could not provide coverage for often lengthy contract periods. Now that the contracts are being written without requirement for insurance, the picture has changed, possibly for good.

Whilst the loss record for CAR liabilities remains excellent, the premium cost for one project can on occasions exceed that of the entire corporate liability program, and disquiet amongst buyers is growing.

### Summary

The Upstream market is largely alive and well and is buoyed by premium income from rate rises, increased drilling activity and the offshore construction sector.

However, with merger activity and more clients seeking alternative solutions, both through OIL and self-insurance, the risk population is declining, thereby leading to less spread and potentially greater volatility in the commercial market.

We all have to keep an eye on the future, and some of the greatest challenges to the commercial market and consequently to its clients remain ahead of us.

These comments apply almost regardless of the sector's combined loss ratio, as a fall in the oil price will change the landscape completely.

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## Market Updates >> Power Generation Utilities

### Property Insurance Pricing

Prices continue to increase, albeit at a reduced rate for those risks that suffered significant price increases last year. The range of rate increases is from 20% to 100%. However, there is a growing split between North American insurers and their counterparts in London and Europe in terms of rating, although the scope of coverage being granted and the level of deductibles continue to be comparable. An example of this pricing differential can be seen in the recent property renewal of a vertically integrated utility with proven thermal generation technology and modest catastrophe peril exposure. In this case the US Domestic market charged 25% less than the London and European market.

### Property Capacity

Utilized capacity in the US Domestic market is approximately US\$400 million excluding FM Global, so if all underwriters are keen to write a particular risk a reasonable amount of capacity can be generated. FM Global can still provide substantial limits depending on their perception of the risk, and currently have quotes outstanding for programs with limits of between US\$1 billion and US\$2 billion. The difference between the past and today's market is that this additional capacity comes at a price, and is not "thrown in" as it was in the soft market. In contrast to this the utilized capacity in the London and European markets is around US\$800 million excluding FM Global, who to date have been concentrating more on US domiciled risks.

### Catastrophe Peril Capacity

Catastrophe peril capacity has become more restricted and sub-limits are the order of the day. The size of the sub-limit will vary depending on the perceived exposure, usually after making a thorough engineering analysis. Available capacity averages between US\$100 million to US\$250 million for windstorm, depending on geographic location, and US\$100 million for flood and earthquake. If a risk is catastrophe exposed we now recommend that a formal analysis be completed before the program is taken to market to ensure the most favourable capacity and terms are secured.

### Catastrophe Peril Deductibles

In addition to capacity restrictions we are seeing a move back to deductibles based on a percentage of the Total Insured Value (TIV), particularly in the USA and the Caribbean. This percentage can range from 2% to as much as 5% depending on the catastrophe peril exposure and the geographical location of the risk, and is almost always subject to a minimum retention of between US\$2 million and US\$5 million. The bigger issue is that percentage deductibles are applied to the TIV per location, which for utility buyers can add up to a substantial self-insured retention. Utilities with large generation plants are typically having to retain US\$2 million to as much as \$5 million on a plant with a US\$250 million value. Some markets will allow a per occurrence cap on the self insured retention, but this comes at a price.

regulated utilities. Replacement power coverage or extra expense is still available; however, the basis of calculation is subject to the same scrutiny as above. Some insurers will look at agreed value programs but full disclosure of how the per diem limits are calculated will need to be shown.

The market for multi-trigger generation outage programs is still available with pricing actually showing a decrease in recent months. Capacity is readily available at providing blended products that include an element of finite insurance. In these cases multi year deals are achievable.

Stand alone business interruption has not been readily available over the last few months but several insurers will now consider providing this in excess of underlying dual trigger programs.

### Primary Insurance Capacity

With the increase in rates and deductibles we are beginning to see markets move back into the primary area by offering insurance layers of up to US\$20 million.

This can allow competitive programs to be structured, with pricing concessions being achieved by moving the more expensive capacity away from the expected loss zone.

### Sabotage & Terrorism

Sabotage and Terrorism is now an absolute exclusion under most insurers' treaties, and any sub-limit granted will be retained net by the insurer. The largest sub-limit we are aware of is provided by FM Global who can offer up to US\$5 million. There are various S&T markets providing combined limits up to US\$350 million, such as ACE, AIG, Berkshire Hathaway, Chubb and Hiscox.

Specifically with regard to utilities AEGIS is currently looking to provide US\$50 million of limit to its members.

However, this is subject to at least 60 members buying into the program and the limit being shared in the event of a loss affecting more than one member. Pricing varies depending on the exposure and location of the assets.

### Business Interruption

This remains an area where underwriters are paying close attention to sums insured and scope of coverage. Many actual loss sustained policies now have the indemnity they provide capped either on a weekly or monthly basis. The basis of calculation of the sum insured is critical and most insurers are looking for supporting work sheets.

Some markets will give business interruption cover to independent or merchant power plant operators but not to regulated utilities. Replacement power coverage or extra expense is still available; however, the basis of calculation is subject to the same scrutiny as above. Some insurers will look at agreed value programs but full disclosure of how the per diem limits are calculated will need to be shown.

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### **Counter Party Credit**

Following the collapse of Enron, many insureds have become increasingly aware of their counter party credit exposure. Most utilities have strong risk management procedures that protect them against this exposure, but more companies are beginning to design insurance programs that protect them in the event that their risk management procedures fail. There is a fair amount of risk transfer insurance capacity available, with \$100 million per counter party generally being available, and this is supplemented with finite insurance.

### **Directors and Officers Insurance**

This is another area that has been directly impacted by the Enron collapse. However, many insureds had experienced significant losses prior to Enron's failure, particularly in the telecommunications industry. This has led to large rate increases for renewals in the international D&O market.

In the US the majority of companies are insured under AEGIS and EIM mutual programs, so the rate increases have been somewhat mitigated, but nonetheless US insureds are experiencing general rate increases as well.

### **General Liability**

Primary: Capacity is still very much available, but rate increases are now being sought by almost every insurer.

Liberty still has an affiliation with AEGIS to coordinate programs where primary or fronting capacity is needed. Fronting is becoming a more prevalent issue for many utilities as they continue to expand their non-regulated businesses which must meet contractual requirements with other parties. In addition, insurers are increasing fronting fees and becoming tougher on reinsurance security criteria.

Excess: AEGIS and EIM remain the principal excess markets and premium increases are being achieved, albeit at less than commercial market averages. AEGIS often require higher self insured retentions for the larger utilities than they did during the soft market, when these insureds retained relatively little risk.

For high excess limits, Bermuda and London continue to provide useful capacity.

### **Professional Liability**

As more utilities expand into non-core areas that have professional exposures (e.g. engineers, computer services, R&D, design, etc.) there is an increasing need to provide evidence of insurance, and therefore to obtain adequate insurance protection. Markets are available, but detailed information is needed. AEGIS and AIG are the principal insurers.

## **Market Updates >> Onshore Construction**

The market, which had been on a roller coaster in the immediate aftermath of September 11, eventually stabilized. Treaty renewals were finally concluded; some insurers withdrew from the sector whilst others moved forward with lower capacity.

There was an all round resolve among insurers to be selective in risks written, to charge higher rates and manage the level of cover given.

### **Stability Restored**

Rate increases vary but for some types of risk are up by as much as 75% on this time last year, when hardening was already underway.

Deductible levels have increased sharply. Also some types of cover are no longer so easy to come by, for example:

- insurers are increasingly reluctant to give Guarantee Maintenance
- an inner limit may need to be applied to Additional Cost of Working cover
- coverage for transit risks and risk at suppliers premises is being restricted
- as with onshore property, terrorism is generally excluded, though some markets – notably Munich Re and AIG
- are prepared to offer write-back endorsements, often on lesser limits or for limited coverage, but generally for the full term of the contract.

Meeting the requirements of lenders can be of paramount importance. Often lenders will only give the go-ahead to a project if, according to their own criteria, adequate insurance cover has been placed. Without the lenders there would be fewer construction projects, so maximizing the coverage and capacity of the insurance market has become crucial to the construction industry.

### **Getting Best Results**

So what is the right approach to get the best results from reluctant insurers?

With construction projects there are many areas of concern to underwriters and the trick is to preempt those concerns.

As with all other sectors of the energy market quality information is vital.

Specifically for construction risks the following are, in addition to a full knowledge of the global marketplace, examples of what is required to get the best from the market:

- details of the parties involved, particularly the contractor and his track record
- the method of carrying out the work and how risks which arise will be managed
- fire protection methods

- means of handling possible unforeseen ground conditions
- natural perils exposure. The more information that can be provided the better underwriters will be able to manage their catastrophe exposures and accumulations
- prototype equipment is always of concern to underwriters and having full details can help to counter insurers' arguments for applying restrictive terms or can at least ensure that restrictions are isolated to specific parts only. In the area of gas turbine technology this is such a big issue
- each risk and client is different, and it is imperative to establish what is the most important area of coverage for the client, and to focus on this. Be prepared to trade off less important coverage to achieve one's goal
- delay in Start up cover is often essential and careful analysis of the exposure is necessary to produce the best outcome.

## **Market Updates >> The Peril of Terrorism**

In the UK and a few continental European countries, special terrorism facilities offered coverage based upon a foundation of countries having experienced repeated acts of terrorism (bombings for the most part) in their homelands. Outside of these countries, there had been little to guide mainstream property and liability underwriters in respect of pricing the peril of terrorism as part of the overall package of perils and coverages offered in the insurance contract. Understandably, underwriters' collective inability to truly conceive of answering the "whether" question in the affirmative – whether it could really happen in such a fashion and to the degree sustained on September 11 – translated into their charging nothing or at most a nominal sum for terrorism coverage.

Assumptions, perceptions, expectations and underwriting and pricing behavior have all undergone a radical transformation. Traditional property insurers have for the most part excluded the peril of terrorism from their policies. (Exceptions are FM Global and AIG, who offer small sublimits and buy-backs, respectively.) Today, terrorism coverage can be obtained through special terrorism underwriting facilities.

Collectively, the seven facilities offering stand-alone terrorism coverage represent a combined capacity of approximately \$1 billion. Coverage is expensive, and underwriting focuses on location, attractiveness as a potential target, proximity to other potential targets, and values at risk.

### **The Onshore Energy Market: Developments from September 11 to today**

In the immediate aftermath of September 11, traditional Onshore energy market insurers stopped writing new business altogether in order to assess their accumulation issues; when they recommenced, terrorism coverage was for the most part excluded.

Specialist terrorism underwriting facilities also had to reassess the catastrophe implications now presented by this class of business. Nuclear risk had long been excluded, but quickly added to uninsurable risks were Biological, Chemical and Cyber Terrorism and Hoax, as the financial consequences were now perceived as too immense for insurers to cope with. The scope of coverage offered was extremely narrow, and only small limits were being purchased.

January 1, 2002 saw the continued elimination of terrorism coverage from property policies as new treaty exclusions came into effect, further stimulating demand for stand-alone coverage. Large numbers of insureds with high perceptions of threat needed to replace lost coverage, as did those insureds whose lenders insisted that they purchase whatever coverage might be available, often regardless of cost.

Over the course of the first half of this year, attracted by high demand and the prospect of entrepreneurial profits, special terrorism facilities and their combined capacity have continued to grow. As we go to press, there are seven carriers, each offering property (property damage and business interruption) limits that may range from \$50 million to \$200 million:

Underwriters focus on the risk's relative attractiveness as a target and its proximity to other potential targets. Energy risks are regarded as having higher loss potential and have therefore been rated accordingly.

Premiums have, however, fallen as underwriters' post-September 11 apprehension has receded. Insureds' responses to marketplace developments have varied, depending upon a number of factors including perceived risk, ability to retain risk, OIL membership, lender requirements and limits provided within original programs.

### **A Forward View**

There are many factors that will determine the shape of the terrorism insurance market in the future. Clearly, another enormous insured loss could cause the immediate and wholesale withdrawal of underwriters from the terrorism marketplace. Barring that, future developments will be a function of the following:

- The number of new insurers and capacity attracted by commercial opportunity.
  - The availability of reinsurance to support terrorism underwriters and increase their capacities.
  - Whether, when and how Energy insurers and reinsurers resume offering terrorism as part of property coverage and to what extent. (More property insurers may come to see that offering some degree of terrorism cover is a competitive advantage.)
  - Enhanced, sophisticated modeling of terrorism exposures by underwriters may lead to greater confidence in their ability to underwrite and price risk appropriately.
  - The amount of worldwide governmental support given to the insurance industry (e.g., whether the US Congress passes legislation creating a Federal terrorism facility).
  - The ultimate impact of statutory rulings on how insurers may or may not amend policies to exclude or limit terrorism coverage.
  - The nature of demand: who wants to buy how much and where? Will demand be widespread over large geographical areas or continue as at present with high demand from insureds with perceived greater exposure, concentrated in high accumulation metropolitan areas, and/ or where lenders insist that terrorism coverage be carried? Although the terrorism market will continue to develop, we see a continuation of current conditions in the near-term.
- Program solutions will be driven by available capacity and the cost associated with obtaining it.

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# Solvency of non-life insurers: Balancing security and profitability expectations

## Report by Swiss Re

The activities of insurance companies throughout the world are subject to supervision in the interest of consumer protection. In the US, Europe and Japan, the deregulation of price and product controls has underlined the importance of minimum solvency margins. The US and Japan have devised similar, complex formulae for calculating the minimum amount of capital funds for insurance companies. These take into account underwriting risk, asset risk and credit risk. In the EU, in contrast, the capital funds required are calculated only on the basis of the underwriting risk. The asset risk is limited by means of investment regulations. to protect the policyholder.

### The function of capital funds

An insurer's core activity is the assumption of risks. This is combined with asset management, since the technical reserves, which are funded using advance premium payments and an insurer's own capital funds, are invested to earn interest. The transfer of risk involves an underwriting risk for the insurance company which may call into question the insurer's ability to fulfil its claims payment obligations or to continue its business operations. Investment in income-bearing assets, too, poses risks, which can endanger the existence of an insurer. Capital funds serve as a buffer against any unforeseen fluctuations in results. What do statistics show as being the main causes of insolvency? Data from A.M. Best on the causes of 683 insolvencies in the US between 1969 and 1998. The most common triggers were insufficient premiums or reserves, rapid growth, and catastrophic events. At least 41% of all insolvencies are attributable to underwriting risks.

Other studies have also confirmed that underwriting risk is the major factor influencing the frequency of insolvencies. there is a connection between insolvencies and the loss ratio of US non-life insurers. It clearly shows that the number of insolvencies tends to rise in years where the loss ratio is high.

A statistical survey of the EU showed that insolvencies and problems have recently occurred both for small, regional insurance companies and for larger companies and groups. A disproportionately large number of new and fast-growing insurers

were affected.<sup>3</sup> However, of the twelve insolvencies in France between 1990 and 1998, only one was attributable to rapid growth. Five cases resulted from the foreign parent becoming insolvent. Two insurers became insolvent as a result of fraud, two due to insufficient reserves and one on account of an inadequate reinsurance strategy.

### The cost of insolvencies and the significance of state guarantee funds

Several countries have established state guarantee funds to cope with the consequences of insolvencies. The US and the UK have introduced protection schemes for all personal lines of business; in Germany and France, such mechanisms are

only in place for motor liability insurance. The following section compares the regulations in the US, the EU and Japan.

### Solvency controls in the US, the EU and Japan

#### Reasons for solvency control

Insolvencies are a normal side effect of competitive markets. The justification for regulatory control rests on consumer protection issues:

- Losses may plunge consumers into severe financial difficulties. This gives rise to a particular need for protection.
- As it is common for current business operations to be financed by advanced premium payments from policyholders, insurers are not subject to supervision by professional creditors or liquid capital markets (as is the case, for example, for bond markets).
- Public sources of information provide insufficient transparency or up-to-date data to allow an insurer's financial situation to be assessed accurately. For the individual policyholders, the effort required to procure and analyze the necessary information is very large. It must normally be assumed, therefore, that policyholders have insufficient information at their disposal. This particularly matters if a guarantee fund is available should

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something go wrong: the policyholders lose the financial incentive to assess the insurer's ability to pay (phenomenon of moral hazard).

- The existence of a guarantee fund may also generate a moral hazard problem with respect to the insurance company. If insurers' contributions to the fund are not commensurate with their insolvency risk, then insurers are provided with an incentive to accept extremely risky business, since the negative consequences are shared by all insurers.

### Comparison of solvency regulations in the US, the EU and Japan

The US and Japan introduced their solvency control in the form of risk-based-capital models in 1994 and 1997, respectively. The RBC system in the US replaced the Insurance Regulatory Information System designed to support the minimum capital requirements in the individual states. In Japan, the risk-based-capital model was introduced following the abolition of price and product controls.

The US and Japan use similar methods to calculate the required capital funds. Both countries use a complex formula which takes account of several risk components, including underwriting risk, asset risk and credit risk. In addition, the US considers the loss reserves risk. Japan also incorporates natural catastrophe and management risks.

In the EU, only the underwriting risk is included in the calculation of capital requirements. The asset risk is limited by means of regulations designed to prevent companies from becoming overly dependent on a particular investment, asset class or region. The lack of asset-risk considerations is one of the main criticisms of the European system. As the example of the US shows, asset risk is of central importance: in 1997, approximately one-quarter of the risk-based capital was generated by asset risk. The advantage of the European system is that it is easier to apply.

One criticism of all three models is that they give insufficient consideration to reinsurance. In the EU, only 50% of reinsurance may be credited. Furthermore, the EU directive disadvantages non-proportional reinsurance in comparison to proportional reinsurance. The EU Commission is currently reviewing how to remedy this and other critical points in the EU's solvency regulations.<sup>7</sup> In the US, reinsurance is included indirectly by using net values for calculating RBC. None of the three solvency systems takes the reinsurer's financial strength into account.

One criticism of the US model is that insufficient attention is paid to the size of the company when determining minimum capital requirements, although according to the law of large numbers the underwriting risk is larger for smaller companies.

EU legislation also takes only partial account of the size of a company in the calculation of minimum capital requirements. Furthermore, the American and Japanese RBC systems neglect the effective covariance between the risk components.

Insufficient attention is paid to the size of the company. Some empirical studies are rather critical of the ability of the RBC system to detect companies endangered by insolvency. A large number of insolvent companies had an RBC ratio above the critical minimum. More refined models, such as cash-flow models, appear to be better suited to detecting insolvencies than the current RBC model.

A quantitative comparison of both sets of regulations illustrates that the American RBC system enforces higher capital requirements on US insurers than the European system. The simulated European target solvency margin is exceeded more often than the RBC requirements. This may be explained by the explicit inclusion of the asset risk in US capital regulations.

### Solvency control in the US

The introduction of the RBC concept in 1994 had the following objectives: (1) closer relation between capital requirements and risk; (2) increase in overall capital requirements in reaction to increased number of insolvencies; (3) standardized regulations in all states; and (4) clearer authority for regulators to intervene. Solvency control is based on a current/target comparison between the available (adjusted) capital and the required (risk-based) capital on the balance sheet date. All the data used are based on the published annual statements, which means that

the introduction of the RBC concept did not require companies to disclose additional data. The RBC formula is based on the following categories of risk:

**R0** Asset risk: guarantees and contingent liabilities from affiliates (determined from their RBC)

**R1** Asset risk: fixed-income bonds and short-term investments (calculated by multiplying by the prescribed risk factors)

**R2** Asset risk: stocks, real estate and participations (calculated by multiplying assets by the prescribed risk factors)

**R3** Credit risk: 50% of RBC of ceded reinsurance and other receivables (calculated by multiplying receivables by the prescribed risk factors)

**R4** Loss reserves risk (calculated by multiplying the reserves with the prescribed risk factors) + R3

**R5** Written premium risk (determined from the company's average loss ratio and market loss ratio)

Off-balance-sheet risks are split into various groups. Non-controlled assets, guarantees for affiliates and contingent liabilities are included in R0. Risks from strong company growth are divided into requirements relating to loss reserve growth in R4 and premium growth in R5. The overall RBC is then determined in accordance with the formula given below. A general reduction is used to compensate for the fact that the various risk categories partially offset one another. However, no attempt is made to quantify or take account of the effective correlation between the various risk groups.

Total RBC =  $R0 + \sqrt{R1^2 + R2^2 + R3^2 + R4^2 + R5^2}$ .

Approximately two-thirds of the RBC is thus determined, either directly or indirectly, by the underwriting risk. Investments in equities, which have grown rapidly in recent years, contributed approximately one-quarter of RBC (part of R0 consists indirectly of the shares risks of subsidiaries).

The regulatory authorities can intervene if various, critical values in the RBC ratio are not fulfilled. The RBC ratio is defined as the ratio of total adjusted capital to the capital amount, which would trigger the right for the authorities to intervene

(the so-called authorized control level). This value is 50% of the total RBC. The regulatory bodies can intervene in the following instances:

RBC ratio >200%: Capital requirements are fulfilled.

RBC ratio <200%: Insurer must file a plan with proposals to correct financial problems (company action level).

RBC ratio <150%: The commissioner can perform such analyses and institute such corrective action as deemed appropriate (regulatory action level).

RBC ratio <100%: The commissioner has the legal grounds to rehabilitate or liquidate the company (authorized control level).

RBC ratio <70%: The commissioner is required to seize the company for rehabilitation or liquidation (mandatory control level).

### **Development of risk-based capital**

The average solvency ratio rose from 72% to 103% between 1994 and 1998. At the same time, the target solvency margin of US insurers also climbed. The ratio of RBC to net premiums jumped between 1994 and 1996, and then leveled off. This was largely due to the increase in asset risk. The ratio of shares to total invested assets rose from 17% to 23%. The asset risk from shares in relation to premium volume increased from 40% to 62%. Approximately two-thirds of the RBC increase can be attributed to the higher asset risk. This clearly illustrates the effect that the asset risk from shares has on RBC (approximately one quarter of the total RBC).

### **Solvency control in the EU**

Solvency control in the EU – similar to in the US – centers on the determination of the capital base, whereby insurers are required to keep capital funds of at least the same amount as the so-called target solvency margin. This target solvency margin is determined using the following components:

#### 1. Minimum guarantee fund

The minimum guarantee fund represents the lowest permissible threshold for the capital funds required. However, it only serves as a restriction for new and small insurers. In non-life insurance, minimum capital funds range from EUR 0.2 to 1.4 million, depending on the line of business.

#### 2. Solvency margin

The solvency margin sets out the amount of capital funds an insurer must have at its disposal during current operations. The requirement is for a capital base of the same amount as either the premium index or the loss index, whichever is higher.

Premium index:

0.18 or 0.1615 \* gross premiums \* retention rate

Loss index:

0.26 or 0.2316 \* gross claims \* retention rate

Retention rate:

Net claims/gross claims (but no less than 0.5)

One-third of the solvency margin is defined as the guarantee fund and is the threshold value below which the regulators are authorized.

The law not only sets out the amount of capital funds which the insurer must have (target solvency margin), but the EU directives also prescribe which balance sheet items are acceptable as capital funds. The actual capital funds available are also termed the current solvency margin.

In addition to the solvency regulations, regulations governing how technical reserves are invested are also aimed at guaranteeing an insurer's solvency. The investment guidelines, which apply to technical reserves, are defined in the third generation of EU directives. When investing technical reserves the insurer should take into account security, profitability and liquidity. In addition, the investments should be sufficiently diversified so as to avoid a disproportionately large dependency on a particular investment, asset class or region.

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Should the solvency criteria not be fulfilled, the following regulatory steps may be taken:

Current solvency margin <target solvency margin: the company must submit a (comprehensive financial plan )for approval to the supervisory authorities. In exceptional circumstances the authorities can limit or revoke the free disposal of invested assets.

Current solvability <guarantee fund: the company must submit a (short-term financial plan )to the authorities. The authorities can limit or revoke the free disposal of invested assets. The authorities may also limit or revoke the free disposal of invested assets if the conditions relating to the technical reserves are not fulfilled.

### **The trade-off between security and capital costs**

Generally insurers hold substantially more capital than the amount required by regulators. The main advantage of this buffer is that policyholders can feel secure in the knowledge that their claims will be paid and shareholders can be comfortable that the ability of the company to continue making profits is protected. However, holding capital funds is costly (capital costs).Incurring unnecessary capital costs lowers shareholder investment returns and raises policy holder premium rates. Below we will analyze in more detail this trade-off between security and capital costs.

A number of stakeholders have perhaps diverging interests regarding the equity base required of an insurer. Policyholders benefit from the knowledge that the insurer can meet claims-paying commitments –yet policyholders do not want capital requirements to become so burdensome that premium rates become excessive. Regulators, too, aim at protecting the consumer while maintaining the long-run viability of insurance markets. A company s owners, in contrast, are interested in generating a high risk-adjusted return on their investments and so must make a trade-off between protecting the franchise value of their company on the one hand and incurring capital costs on the other. Both staff and management have a vested interest in keeping their company in business and in having leeway for action, while also keeping shareholders happy. Rating agencies, too, are interested in the fulfillment of all obligations, which includes all the claims of investors. Each of these stakeholders has a different view regarding the trade-offs involved in holding capital, and conflicting views about the optimal amount of capital funds can result.

From the investors standpoint, the fact that an insurer has capital funds available which it can reinvest in the capital market gives it the traits of an investment fund. The insurer s indirect investment risk in the capital market is leveraged by the underwriting risk. However, an insurance company s investment of capital involves substantial tax disadvantages and agency costs when compared to a direct investment by an investor.

### **Capital requirements of the rating agencies**

The capital requirements imposed by the rating agencies are becoming increasingly important to the success of insurance companies. In a market characterized by growing international competition, a top rating is a must. The capital requirements needed in order to be assigned a top rating are normally higher than those laid down by state regulators.

Rating agencies aim at encouraging security in the fulfillment of payment obligations to policyholders and investors. In addition to solvency, criteria such as liquidity, financial strength and management quality are factored into complex models. Given the different models, it is difficult to find an empirical agreement between the solvency ratio or risk-based-capital ratio and the ratings. An analysis of 878 US companies revealed only a very minor correlation between the risk-based-capital ratio and the ratings assigned by A.M.Best, which are based on publicly accessible information. A model, which included factors such as corporate size and legal form besides the risk-based-capital ratio, can account for only 10%of the variation in the ratings.

### **Current developments and trends in solvency regulation Changes in the EU**

Currently only individual companies are subject to solvency supervision in the EU. This enables insurance groups to use the same capital funds several times at different levels; this is termed double gearing. If a parent company increases the capital funds of a subsidiary, Supervision will remain at the individual company level, but regulators will require intra-group relationships to be monitored as well.

The current solvency margin regulations do not take the risks of long-tail business sufficiently into account, eg in liability insurance. Regulators have therefore proposed introducing a third index based on technical provisions.<sup>41</sup> This so-called provisions index would be used whenever it is higher than the premium or loss index. Such an index, however, would encourage insurers to lower the level of their technical reserves in order to reduce the amount of capital funds they are obliged to hold. Simulations have shown that those companies whose solvency margins turn

out to be too low in the three-index system would be deficient under the present system with two indices as well.<sup>42</sup> Because of these disadvantages, the insurance industry has suggested as an alternative the introduction of higher percentage rates for the calculation of premium and loss indices for long-tail risks.

Proposals by the regulators to include investment risk in the calculation of the solvency margin have been put on hold for the time being.

Although it has been frequently criticized, the European Commission has ruled that the maximum adjustment for reinsurance should not be increased from the current level of 50%.

### Cash flow models /Dynamic financial analysis

Criticism of the static nature of the current solvency model and its focus on the past as evidenced by its use of annual report data has led to a discussion of future oriented models. The cash flow models that are often used in this context are based on the principle that the economic value of a company is determined by the discounted value of all future cash flows. Cash flows are forecast over a certain planning horizon and the cash values added. The cash flow forecast is heavily dependent on the assumptions made regarding the future development of the business.

Given the interaction of risks on the asset and liability sides, this model is also a regular topic of discussion in the context of asset-liability management. For regulatory purposes the focus is on honoring existing obligations, however. Cash flow models that are drawn up at the request of regulators tend to simulate the liquidation of the insurer (run-off) and not a continuation in the underwriting of new risks, as in the case of asset-liability management.

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