

BENFIELD



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In the sixth edition of **B** we revisit the troubled topic of legacy issues and comment on the far-reaching changes taking place in the European reinsurance market. We also review post-renewal market trends, look at the challenges of insuring nanotechnology and discuss the reality behind

the market's increasing focus on reinsurance credit risk. **B** is published by the Benfield Industry Analysis and Research Team. Benfield has a long-standing commitment to reinsurance research and analysis and sponsors the Benfield Hazard Research Centre.

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EUROPEAN REINSURANCE CAPACITY ECONOMIST'S SHARE

EUROPEAN REINSURANCE CAPACITY

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The continuing strain imposed by legacy issues and weak financial markets is forcing hard-pressed European reinsurers to adopt increasingly radical strategies to protect both profitability and balance sheets. As well as imposing higher prices and tighter terms and conditions, the more stringent approach has led some reinsurers to cut back or even abandon the traditional basis of quota share coverage offered to direct cedants. In some markets this restructuring of coverage has wide ranging implications and is throwing some long-standing relationships into question. The approach of reinsurers to European renewals included the following changes to established practices:

- The application of rigorous pricing disciplines. Business falling short of hurdle rates was cancelled or not renewed.
- Imposing tighter terms and conditions – eg higher deductibles, lower limits, restrictions on scope of coverage (eg terrorism and nuclear risks), the wider use of exclusions and specific definition of risks included within contracts.
- Demanding greater levels of information from cedants in support of underwriting and for future monitoring of risks accepted.

Other measures included the phased reduction and withdrawal of traditional coverage such as unlimited auto third party liability, and drastic limits on risks such as terrorism and nuclear within property lines.

Comments from Munich Re typify reinsurers' strict application of risk-adequate pricing¹: Munich Re is restricting quota share capacity to cedants seeking pure capacity only, who are able to implement strict risk-related pricing on the original risks. The company is applying increasingly sophisticated prospective pricing models. It is also introducing permanent monitoring of original risk pricing, with additional underwriting audits of cedants. In Europe, the selective renewals led to a slight reduction in Munich Re's renewed premiums. Hannover Re noted that it had significantly raised its prices in non-proportional business (including motor liability), and introduced a EUR50mn limit on German proportional motor third party liability business. Other reinsurers in Europe and Bermuda reported similar robust action.

So, where does this leave reinsurance buyers? Most obviously, they have sought to contain their reinsurance costs through restructuring their programmes, for example by moving away from pro-rata treaties to excess of loss coverages and increasing retentions. But a more subtle change has been occurring in many European markets, as reinsurance managers have been forced to look for solutions beyond their traditional direct relationships in order to obtain satisfactory cover.

There are significant regional influences in the structure of the reinsurance market: Germany has traditionally been a direct market place, where pro-rata reinsurance has been the dominant product. "Win or lose together" is an apt description of the mutual dependence between insurer and reinsurer. Elsewhere, brokers have a dominant position, such as the Nordic region and the UK. A recent report from Swiss Re suggests that over 80% of the UK commercial (re)insurance market is brokered.²

It is, of course, an over-simplification to say that in some long established direct reinsurance relationships, a major reinsurer would effectively take the role of senior partner, telling its junior partner and customer what reinsurance it should buy, and at what price, and assuming substantially all for its own account. Nevertheless, this hypothetical scenario probably contains more than a grain of truth. Many cedants have historically relied on a strong link with one or two major reinsurers, who act as the first choice market.

The response of reinsurance buyers across Europe has naturally differed, reflecting the characteristics of the market. The German-speaking markets appear to have experienced the most extreme reactions. Reinsurance buyers commented on:

- Late communications – in the last renewal round, reinsurers were frequently late on responding, often with queries or requesting changes, leaving little time for negotiation.
- Lack of differentiation – reinsurers tended to present cedants with a standard product menu, inviting them to take their pick!
- Unrealistic information demands, without distinction between what is necessary and what is desirable.
- Drastic changes in pricing and/or terms and conditions. It seems that reinsurers have sometimes sought to correct for several years of the soft market at one go. In some instances this has led to price increases which the insurer cannot pass on to the original insured.
- Lack of delegated authority. Reinsurance underwriting decisions are increasingly being referred to higher levels, with consequent delay.
- Unwillingness to accommodate customer-specific solutions. It seems that in some cases, reinsurers have become more providers of product rather than solutions. "If we don't have it, you don't need it."
- The Christmas present! Notice of cancellation – arriving in the last days of December.

Nevertheless, it is fair to say that most companies renewed their coverage, albeit in some cases at higher prices and with more onerous conditions than they would have wished.

In the Benelux countries, there are also some strong direct reinsurance relationships, but brokers also have a significant market share. Reaction here was less severe. Problems with last minute demands from reinsurers was much less of an issue than in Germany. However, reinsurers had generally given notice of impending changes to coverage, terms and conditions. There was a heightened focus on conditions, particularly exclusions, in long tail business. Reinsurers typically presented a standardised list of exclusions "one size fits all", which was only adjusted to particular circumstances after intense negotiations. Withdrawal of certain cover from major lines, such as nuclear exclusions on property, presented insurers with a potential mismatch, since these risks are included in the underlying insurance policies, which cannot easily be changed, particularly for long-standing customers.

Aggregation was also an issue: as the major reinsurers have a very large market share, they have attempted to contain their risk aggregations and concentrations in certain lines (eg marine storage – an important business in The Netherlands). This has presented individual insurers with capacity problems, forcing them to broaden their panel of reinsurers. This in turn has led to the increased use of brokers to access additional markets such as Bermuda and Lloyd's.

In other countries, managing the relationship with major reinsurers was the key to avoiding bad surprises. Dialogue between cedants and reinsurers has been continuous, so more stringent information requirements were anticipated well in advance, and by negotiation, cedants were able to prioritise additional information requests. However, higher pricing and stricter terms and conditions have caused reinsurance buyers to adopt a more opportunistic approach, especially in relation to new markets.

A number of reinsurance buyers have noted the need to approach new broker-oriented markets to replace capacity – for example direct markets whose share has been reduced on security concerns. Others have increased their use of additional services offered by reinsurance brokers, as buyers sought to diversify their reinsurance panels.

At the opposite end of the spectrum, in broker-dominated markets such as parts of Central Europe, the Nordic region and the UK, reinsurance managers appear to have experienced fewer difficulties. The January 2004 renewal witnessed little change in the structure of reinsurance programmes, such as moving from pro-rata to excess of loss. Reinsurer security and a spread of carriers was a prime concern. Heightened information requirements was not a major issue. As many of the world's major reinsurers were subject to ratings downgrades during the year, there was increased acceptance among cedants of markets such as Bermuda and Lloyd's. Reinsurance managers noted the increased importance attached to modelling in the latter markets, but expressed concern that different modelling assumptions and interpretation of the data can lead to wide variations in price. In markets such as the Czech Republic, where a series of large losses have produced poor technical results over the last few years, the move towards non-proportional business has been more pronounced. Interestingly, however, there was a tendency for some major reinsurers to try to increase the amount of business contracted on a direct basis.

THE CHANGING ROLE OF THE REINSURANCE BROKER

The role of the broker in Europe has evolved from simply matching demand and supply to one of a partner and consultant, with the provision of value added services such as risk management advice and modelling, actuarial consultation and dynamic financial analysis. Munich Re, historically principally a direct market in both stance and business mix, has recognised the enhanced role of the broker: "Business contracted through brokers is a special kind of project partnership. Its importance has grown perceptibly in the industry in the last few years. In some market segments, it extends the value chain between insurer and reinsurer, brokers acting more and more as links between the two."³

CONCLUSION

The European reinsurance market is experiencing far-reaching change. There has been significant erosion of traditional reinsurance capacity, as a number of formerly important players have withdrawn, such as Gerling, or scaled back, such as SCOR. Poor financial markets compounded by the effects of legacy reserving issues and large losses from 9/11 have prolonged the hard market, which is only now showing moderate signs of softening. Unlimited quota share capacity has been reduced. Reinsurance terms and conditions have become much more onerous and restrictive. Reinsurers, particularly those with higher financial strength ratings, have become increasingly sophisticated in their approach to capital allocation.

Reinsurance buyers have been squeezed as reinsurance prices have risen, and cover has been restricted, not all of which can be passed on to the insurer's customers. Those with historically strong direct links with one main reinsurer have probably fared worse than those active in broker markets who have been able to access alternative markets to obtain suitable cover. Many former 'direct' buyers are making more use of the broker market in order to lessen their dependence on a single reinsurance supplier, but as yet there does not appear to have been a wholesale restructuring of reinsurance programmes.

While the capital-rich 'new' Bermudians may not have been as successful as they had hoped in making inroads into the European market at year-end renewals, (see 'Holding the Line' further into this edition of B), the shift from traditional direct capacity and exclusive cedant/reinsurer relationships towards more diversified broker-led programmes looks likely to continue. Moreover, the more stringent approach being adopted by direct reinsurers, particularly the restrictions on unlimited quota shares, seems likely to generate consolidation in the more fragmented markets such as Germany, where many small insurers lack the capital to operate without the 'umbrella' of their reinsurer's balance sheet.



QUANTIFYING REINSURANCE

CREDIT RISK

Reinsurance credit risk has been steadily rising up the agenda of insurance industry concerns. Reinsurance failures overall are relatively rare, but since the mid-1990s some high profile cases, particularly in Australia, have highlighted the issue of reinsurance credit risk. The size and scope of the 9/11 losses also underlined the importance of reinsurers' ability to pay claims in extreme distress scenarios. At the same time, insurer exposure to reinsurance credit risk has been increasing.

Benfield's analysis of the statutory returns of over 2,600 US non-life insurers reveals that the total amount they expected to collect from reinsurers grew from US\$120bn to US\$188bn between 1996 and 2002, an increase of 57%. More significant is the increase in credit risk gearing. The proportion of total reinsurance recoverable (RR) to surplus rose from 54% to 79%, representing a large increase in credit risk exposure. This reflected not only the rising value of the RR, but also meagre growth of only 7% in the companies' capital between 1996 and 2002 as illustrated by Figure 1, overleaf.

The predominance of RR is an important issue. In addition to the risk of direct loss arising from a default, liquidity is impaired and potential investment income forfeited. Furthermore, unlike listed bonds and equities, a liquid market does not exist for

trading RR. Thus creditors cannot readily close or shorten their positions if concerns about the creditworthiness of reinsurers arise. Excessive exposure to reinsurers was a material factor in the collapse of the US-based Reliance Group Holdings in 2000. Its ratio of RR to consolidated surplus exceeded 600% at a time when no liquid assets were held in the holding company and several tranches of sub-investment grade debt were due for repayment.

It is not surprising therefore to discover that reinsurance credit risk has attracted increasing attention from regulators and the credit rating agencies. Most risk-based capital (RBC) models now include an assessment of reinsurance credit risk and impose consequential capital charges, which are, in effect, inferred bad debt provisions set by regulators and/or rating agencies. This effectively increases the cost of capital, especially for highly-g geared cedants, for what are essentially un-remunerative assets for as long as they remain uncollected.

The provenance of RR charges in some RBC models seems to be bond default rates. For example, the capital adequacy ratio (CAR) calculated by S&P as part of its insurer rating process employs default rates for reinsurance recoverable capital charges that appear to be derived from its general

bond default rates. The S&P charges represent the inferred capital provision required to absorb losses that might arise from the default of unsecured reinsurance recoverable¹. By applying the S&P CAR rates or similar rates employed by other agencies, it is possible to compute a theoretical default risk for reinsurance recoverable. Thus, reinsurance recoverable with a S&P rating of "BBB" has a 4.7% risk of default over a 10 to 15 year period.

CASE STUDY – A US P&C INSURANCE COMPANY

The application of S&P default rates is best illustrated with a case study using Part 3 of the Schedule F from a US P&C insurer's annual statutory return. In the case of our chosen company, year-end 2002 reinsurance recoverable, less funds withheld, from authorised reinsurers totalled US\$1,773mn. Of the total amount, 83% was due from reinsurers with a S&P rating of "A-" or higher and 13% was due from unrated counterparties. Figure 2, overleaf, shows the breakdown of reinsurance recoverable by S&P rating grade.

The S&P capital charges were applied to the authorised RR to calculate an amount that could be used as a proxy for an inferred bad debt provision. S&P capital charges increase exponentially as the rating grades decrease. Consequently, a

FIGURE 1 – US PROPERTY & CASUALTY INSURERS REINSURANCE RECOVERABLE

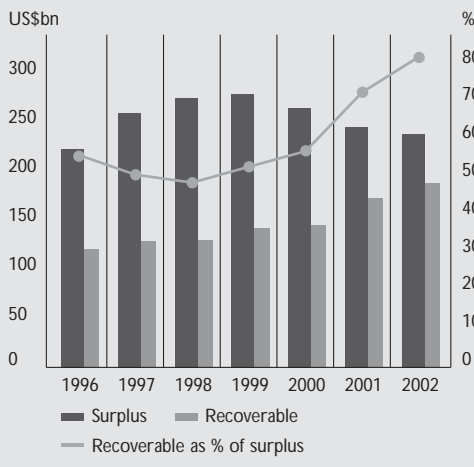


FIGURE 2 – SPECIMEN INSURANCE CO – RATING OF NET REINSURANCE RECOVERABLE LESS FUNDS WITHHELD – NET REINSURANCE RECOVERABLE US\$1733MN

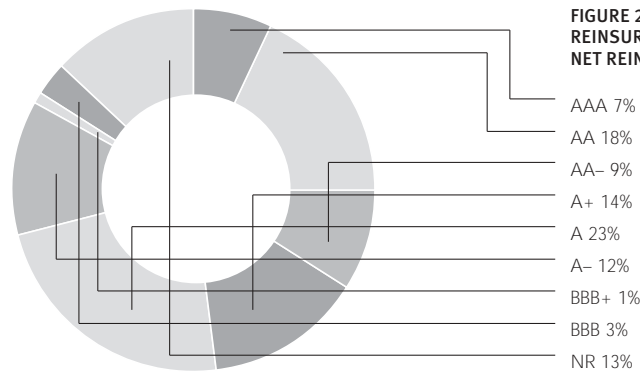
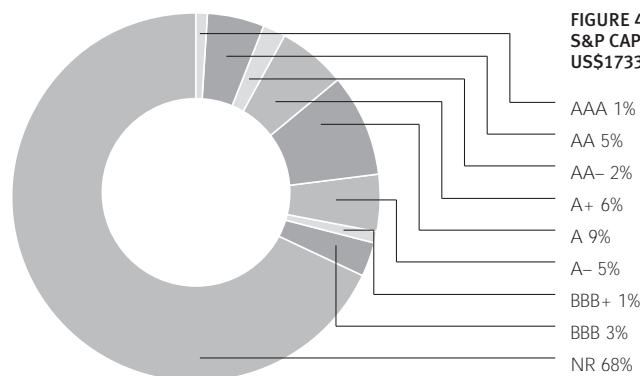


FIGURE 3 – S&P REINSURANCE RECOVERABLE CAPITAL CHARGE CALCULATION – US\$MN

Rating	Recoverable	S&P Factor	Capital Charge
AAA	121	0.5%	0.6
AA	312	1.2%	3.7
AA-	156	1.2%	1.9
A+	243	1.9%	4.6
A	399	1.9%	7.6
A-	208	1.9%	4.0
BBB+	17	4.7%	0.8
BBB	52	4.7%	2.4
Not rated	225	25.0%	56.3
Totals	1,733		81.9

FIGURE 4 – SPECIMEN INSURANCE CO – DISTRIBUTION OF S&P CAPITAL CHARGE – NET REINSURANCE RECOVERABLE US\$1733MN



relatively small exposure to unrated RR charged at 25% can have a dramatic effect on the capital charge. The inferred capital charge in this case was US\$82mn as shown in Figure 3 giving a weighted average credit rating of "BBB".²

The capital charge was skewed by the unrated counterparties, which represented 68% of the charge, but only 13% of the net amount of reinsurance recoverable. Furthermore, just two unrated counterparties accounted for 43% of the total capital charge of US\$82mn. The disproportionate amount of the charge attributable to the unrated recoverable and the high level of concentration provide strong incentives for the reinsurance creditor to close or reduce these positions. Figure 4 shows the breakdown of the capital charge by S&P rating and clearly demonstrates this point.

ISSUES

The method used to compute the theoretical default risk of the reinsurance recoverable asset is simple, but, in practice, it can be problematic. Fundamental problems include the definition and identification of a reinsurance default, which is far more difficult than defining a bond issuer's obligations. For example is a commutation a default event? Furthermore, most RBC models also do not include a duration factor. Instead they apply a flat charge to each rating grade irrespective of the likely duration of the settlement process, which may be very

lengthy especially in run-off situations. Given that the base characteristics of reinsurance recoverable are so different from other forms of debt, there is quite possibly little correlation between bond default rates and actual reinsurance default experience.

A.M. Best recently attempted to address this problem with a commentary on insurance impairment rates based on a study of the US insurance industry.³ The rating agency argued that general corporate default statistics were inappropriate for assessing insurance credit risk because of regulatory and accounting issues that are peculiar to the insurance industry. A.M. Best prefers the concept of impairment rather than default because financial impairment often occurs before a formal declaration of insolvency. Regulatory control, for example, might result in the subordination of reinsurance creditors to insurance policyholders on composite balance sheets; an issue that has come to prominence in Europe following the enactment of the EU Winding-up Directive in 2003.

Another potential problem about the use of default charges is that it could lead to large exposure to a small number of counterparties. As the charges decrease as the rating grade rises there is an incentive to use only the highest credit grade reinsurers. However, a consequence of the market-wide lowering of ratings of the reinsurance sector since 9/11 is the

smaller number of reinsurers with Triple and Double "A" ratings. In the absence of a concentration charge or penalty, cedants may be overlooking the importance of spread if focused entirely on default charges. This may result in too much reliance on a few markets and unwelcome exposure to increased "willingness to pay" risk.

CONCLUSION

Bond default rates and their various derivatives are an imperfect proxy for measuring reinsurance credit risk. However, their increasing use for calculating inferred bad debt provisions shows that companies are taking the issue of credit risk more seriously. But quantifying the risk is not enough; cedants need to mitigate credit risk through active and determined management of collection and spread of counterparties.

Finally, it is as well to keep reinsurer credit risk in proportion. In an analysis of 218 US non-life insurers that became insolvent between 1993 and 2002,⁴ A.M. Best reported that precisely none failed as a consequence of reinsurance default. Indeed with 51% of failures due to inadequate loss reserves, 10% to excessively rapid growth and 8% to discounted operations, it would appear that notwithstanding greater focus on credit risk, the greatest threat to insurers continues to be themselves.

1 Standard & Poor's Rating Criteria for Property/Casualty Insurers, page 38. 2 Capital Charge/Net Reinsurance Recoverable ie 82m/1773m = 4.7% = "BBB". 3 "Best's Impairment Rate and Rating Transition Study – 1977 to 2002", A.M. Best, 1 March 2004. 4 A.M. Best Special Report, 10 March 2003.

Insurance companies are unusual in that they do not know what eventual delivery of their product will cost, or even if delivery, in the form of paid claims, will ever be required. Accuracy in pricing is all the more difficult given the rapidly changing claims scenario, particularly in the US. For casualty lines the problem is most acute, given that it may be many years before the customer actually demands the product, by which time claims costs have escalated far beyond the levels estimated when the coverage was priced. This is the root of the huge shortfalls in reserving caused by escalating asbestos-related claims, as historic years have had to be continually reassessed.

The insurance industry sought to contain casualty claims escalation with the shift in the mid-1980s from the occurrence policy form (all claims occurring within the policy period) to the claims made form (all claims made within the policy period), the addition of the absolute asbestos exclusion clause and the amendment of the pre-existing pollution exclusion clause, making it "absolute" rather than "sudden and accidental". Reserving issues surrounding the older years asbestos liabilities have been exacerbated by the soft market of the late 1990s, when premiums were reduced, terms were relaxed and coverage broadened; in some classes policies were written for periods of three years rather than one, in others the occurrence form re-emerged. Although some companies felt able to release reserves on the back of strong investment markets and a temporary abatement of asbestos claims in the late 1990s, this optimism soon proved misplaced and adjustment to prior year reserves or reserve strengthening have become regular features of insurer results once more. 2003 results proved no exception although, in contrast to 2002, reserve strengthening was directed more at sins of the recent past than the more aged asbestos liabilities that had featured so heavily in 2002.

2003 RESULTS

After significant strengthening of Asbestos and Environmental Pollution (A&E) reserves in 2002, A.M. Best¹ concluded that asbestos reserves increased by 47% in 2002 and that incurred losses were twice the level of 2001, which in turn were three times greater than those of 2000. It was hoped that there might be some respite for the industry in 2003. Figure 5, overleaf, shows key reserve strengthening exercises for companies in 2003. Instances of reserve additions of under US\$150mn have been excluded.

It is clear that A&E reserve strengthening was much less prevalent, although Hartford was a notable exception with additions more in keeping with the jumbo provisions made

in 2002. Nevertheless there were some other disappointments as Chubb added a further US\$250mn to the US\$730mn in 2002. Elsewhere a review of US A&E exposures at Swiss Re America resulted in a US\$410mn increase.

Closer analysis of the 10K statements reveals that liability lines in the soft market period 1997-2001 caused the problem. While the deterioration in this area had been highlighted by insurers, its extent, a total of US\$18.5bn shown in Figure 5, was a disappointment. Strengthening asbestos reserves for distant liabilities somehow seemed more excusable to the market than making amends for optimistic pricing of the recent past. Trends in casualty claims have continued to rise, fuelled by the US tort system and medical inflation. Problems in medical malpractice, directors' and officers' liability, excess casualty, professional liability and workers' compensation were commonly cited. Losses attributable to the US casualty market are estimated in Figure 5. The "other" column includes non-casualty problem areas as well as reserve releases.

Further analysis can be conducted with the help of the statutory returns filed by US domestic companies. Schedule P of these returns provides a history of losses and loss expenses. Care has to be taken when comparing US GAAP and statutory reports not least because the statutory data will exclude non US domiciled companies. Nevertheless data at the industry level confirms the overall picture. Figure 6, overleaf, shows the industry aggregate data for "liability" lines as defined in the statutory returns². Total reserve strengthening for the industry at US\$13.7bn includes a US\$4.9bn reserve release on the 2002 accident year. Interestingly US\$0.9bn of this emerges from the longer tail liability lines. It could be argued that the relative immaturity of this class precludes reading too much into this trend. Indeed, compared with the prior calendar year, 2003 saw almost double the adverse reserve development on all lines for the 2001 accident year. Earlier accident years also saw some deterioration during 2003 although this was less pronounced on 1997, 1998 and 1999. Leaving aside the debate on this score, Figure 6 does clearly show the years of 1997-2001 are still a problem with reserve strengthening from this period amounting to US\$11bn. US\$6.5bn of this arose in the liability lines accounting for almost 50% of the US\$13.7bn total or 1.7% of total 2003 net earned premiums.

Looking at the top ten largest writers of this liability business in the period, as shown in Figure 7, overleaf, it is not surprising to see a number of them also featured in the key reserve strengthening list. Figure 8, overleaf, shows Schedule P data for companies including the market leaders in liability lines.

The reserving drag for liability lines has been considerable for some and well in excess of the industry 2.7 percentage point cost for total liability lines in 2002 and prior. CNA suffered a 28 percentage point hit on its combined ratio. The damage at SCOR was more painful given that it had a market share of 0.1% of the US liability lines between 1997 and 2001. The sins of the past are clearly visible but so too are more encouraging features. The reserve release from State Farm on the 2002 year is notable for its absolute and relative size. More intriguingly, perhaps, is the fact that over 50% of it emerges from liability lines.

LIABILITY ISSUES PAST . . .

Tort costs have escalated since 2001 and accounted for 2.2% of US GDP in 2002.³ This trend is expected to continue with estimated tort costs of possibly more than US\$1,000 a citizen by 2005: up from US\$809 in 2002.⁴ It is no wonder that there has been disappointment at the failure of tort reform in 2003, not only for asbestos but also medical malpractice.

Since 1975 medical malpractice costs have exceeded increases in US tort costs, rising by a factor of 21 while other tort costs have grown by a factor of 11. Hopes for a Federal solution to the medical malpractice crisis were dashed in July 2003 when the Democrats quashed a House medical malpractice reform bill. Among other things this would have limited non-economic damage awards, attorney fees and imposed a statute of limitations on filing such cases. Yet despite the failure of Federal tort reform, progress has been achieved at the State level. For example, reform proposals have had some success in capping non-economic awards.

The Fairness in Asbestos Injury Resolution Act (s.1125) was aimed at the establishment of a trust fund that could be drawn upon according to certain medical criteria, but this also looks unlikely to be accepted. In April this bill failed to win the requisite number of votes to progress to the next stage, an outcome widely anticipated by the industry. Like medical malpractice initiatives, however, headway has been made at the State level and there is a willingness in the face of the ballooning claim filings to find a legislative solution. The introduction of inactive dockets, thereby limiting the progress of unimpaired claims, is gaining acceptance and restrictions concerning the eligibility of plaintiffs to apply for court hearing in certain States has also been instigated.

. . . PRESENT AND FUTURE

While historic liabilities have haunted the insurance industry, it has to be on its guard for new loss makers. There was a fear that toxic mould would become the "new asbestos", but

SINS OF THE PAST LEGACY ISSUES

¹ Asbestos Wave Rises, Crest Yet to Come, A.M. Best October 2003. ² Private passenger auto liability, commercial auto liability, workers' compensation, other liability claims-made & occurrence, products liability claims-made & occurrence plus medical malpractice claims made and occurrence. ³ US Tort Costs: 2003 Update, Tillinghast-Towers Perrin. ⁴ Ibid.

these concerns have now receded as paid losses and claim counts are finally moderating.⁵ Again there has been progress at the State legislative level with some States granting builders the time to correct construction defects before lawsuits can be filed. In 2002 it seemed the "new asbestos" was in fact asbestos, but in 2003 silicosis, fast/high fat foods, obesity and reality TV were named as potential candidates.

Crystalline silica is the second most common mineral on the earth and a major component of sand, rock and mineral ores. Over exposure to respirable silica can cause silicosis – a disabling and sometimes fatal lung disease. More than one million US workers are exposed to silica and each year more than 250 of them die with silicosis. By mid-2003 some 15,342 plaintiffs had named US silica in lawsuits, a threefold increase on the total for 2002.⁶ One large insurer has 30,000 claims for silica.⁷ It has been suggested that the rise in silica claims has been driven by the lawyers seeking to diversify portfolios of claims from asbestos alone. Many commentators argue that

the potential cost from silica is limited given the relatively low silicosis death rate compared with the 2000 per annum from asbestosis. Others disagree, such as S&P Director John Iten who said that silica claims "look and feel a lot like the early days of asbestos".⁸

Claims against fat/fast food producers may be potentially more serious given the high incidence of obesity in the US – only Colorado has an obesity prevalence of less than 10%. This topic has been closely watched by the insurance industry. According to the US Food and Drug Administration (FDA) nearly two thirds of the nation's population is overweight, and children now have weight problems at twice the rate of 20 years ago. Food companies are mindful of the risk and some have now placed warnings about over-eating on packages and a few have donated exercise equipment to schools. Again legislative reform seems a solution. The Responsibility in Food Consumption Act, or so called "Cheeseburger Bill" limits civil lawsuits based on consumer allegations that restaurants and

food producers made them fat. It still has to pass through the Senate but it seems that common sense and personal responsibility are gaining some supporters.

Thus there are some signs that the factors beyond the insurers' control are beginning to change and the insurance company chequebook may not be seen as the solution to all problems. In the meantime the 'sins' of the more recent past have certainly helped insurers to refocus on underwriting. While it may be too early to take the 2002 reserve redundancy as a portent of the future, the changes to casualty pricing, terms and conditions seen since the start of the new millenium offer some hope that current business at least will prove less problematical.

A more detailed IAR Benfield report on 2003 reserve development will be published following the release of consolidated statutory data.

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FIGURE 5 – KEY RESERVE STRENGTHENING IN 2003 – US\$MN

	A&E	US Casualty	Other	Total	After-tax charge/SHF
CNA	795	2,050	–	2,845	22%
Hartford	2,824	–	–	2,824	17%
Zurich (Centre Re)	350	1,195	329	1,874	7%
AIG	95	1,536	–	1,631	2%
Royal & SunAlliance	270	875	405	1,550	20%
GE Global Ins Holdings	–	900	–	900	9%
XL Capital	–	1,149	–212	937	9%
Chubb	250	147	–	397	3%
Swiss Re	71	608	–	679	3%
St Paul Companies	–	701	–55	646	7%
Equitas	628	–	–	628	53%
Travelers	60	628	–306	382	2%
Allstate	520	102	–221	401	1%
American Re	–	369	–	369	7%
SCOR	–	280	65	345	33%
Liberty Mutual	331	358	–	689	7%
WR Berkley	–	273	–4	269	12%
Everest Re	50	214	–7	257	6%
Safeco	–	250	–	250	3%
General Re	–	356	–119	237	3%
PMA Capital	–	219	–	219	33%
ACE Ltd	–	191	–27	164	1%
Total 2003	6,244	12,401	–152	18,493	6%

Assuming a 30% tax charge

FIGURE 7 – MARKET SHARE OF LIABILITY LINES, 1997-2001 – US\$MN

	Market Share
State Farm II	11.2%
Allstate Insurance Group	6.8%
American International Group	5.8%
Zurich American Ins Group	5.3%
CNA Insurance Group	3.9%
Liberty Mutual Insurance Group	3.2%
Nationwide Corp	3.1%
Travelers Property Casualty Corp Group	4.0%
Progressive Group	2.9%
Berkshire Hathaway	2.4%
Top Ten	48.5%
Total industry liability net premiums written 1997-2001	664,802

FIGURE 6 – 2003 ONE YEAR DEVELOPMENT INCURRED LOSSES BY BUSINESS LINE AND ACCIDENT YEAR – 2003 INCURRED LOSS DEVELOPMENT BY ACCIDENT YEAR – US\$MN

	Prior year	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Private passenger auto liability	46	–2	5	–8	–16	–51	–91	84	–97	–688	–819
Commercial auto liability	–16	–3	–5	–20	–5	43	149	297	347	–290	497
Workers' compensation	332	107	48	137	47	345	374	547	221	88	2,246
Medical malpractice	–18	–2	15	42	8	156	250	422	617	294	1,785
Other liability	3,250	–79	–16	–33	56	18	671	1,155	647	–161	5,508
Product liability	869	6	29	54	25	57	116	89	1	–120	1,126
Total liability	4,463	26	76	172	114	568	1,469	2,594	1,736	–876	10,343
All lines	6,394	339	602	337	554	1,351	2,897	4,044	2,139	–4,931	13,697
Total liability as % All lines	69.8%	7.8%	12.7%	50.9%	20.6%	42.1%	50.7%	64.2%	81.1%	17.8%	75.5%

FIGURE 8 – 2003 ONE YEAR INCURRED LOSS DEVELOPMENT BY BUSINESS LINE – 2003 TOTAL ONE YEAR INCURRED LOSS DEVELOPMENT – US\$MM

	Private passenger auto liability	Commercial auto liability	Workers' compensation	Medical malpractice	Other liability	Product liability	Total liability	All lines	Total liability as % all lines	Total premiums earned(PE)	Liability/ PE
SCOR	10	60	47	-	55	-5	167	274	61%	412	40.6%
CNA	16	14	238	102	1,130	266	1,765	2,358	75%	6,260	28.2%
St Paul	7	-9	96	451	236	49	830	599	1,39%	6,079	13.7%
Zurich American	341	45	392	251	426	-127	1,329	1,554	86%	16,685	8.0%
Liberty Mutual	52	9	473	-	230	87	851	748	1,14%	11,162	7.6%
AIG	145	44	149	234	823	118	1,513	1,673	90%	24,994	6.1%
GE Global	33	-19	54	67	159	6	301	705	43%	5,124	5.9%
Munich Re	17	10	-42	25	68	-	78	528	15%	1,602	4.9%
Nationwide	13	-15	11	-	277	113	400	466	86%	13,212	3.0%
Travelers	-43	102	52	23	246	-5	376	390	96%	12,518	3.0%
Allstate	-108	20	-1	-	30	516	456	467	98%	24,083	1.9%
Swiss Re	2	-9	-5	15	32	-2	31	785	4%	1,915	1.6%
State Farm	-1,144	9	23	-	-36	-	-1,148	-2,172	53%	45,306	-2.5%
Industry aggregate	-819	497	2,246	1,785	5,508	1,126	10,343	13,697	76%	387,566	2.7%



NANOTECHNOLOGY NEW OPPORTUNITIES NEW RISKS

Nanotechnology is the development of new materials and processes by manipulating molecular and atomic particles. These material properties do not exist naturally and incorporate a variety of scientific disciplines using particles that are measured in nanometres, or billionths of a metre. This technology will allow researchers to build from atoms upwards.

Nanoscience holds the promise of transforming the way we live our lives. It can make objects and structures about a millionth of a millimetre in size and the full potential of these products is only just being explored.

For example, it may be possible to produce tiny switches, shuttles, and materials that react to their environment on the molecular level. This eventually could lead to such innovations as buildings and bridges that 'heal' themselves, self-repairing clothing, powerful computers the size of a button and medical probes smaller than cells.¹

Nanotechnology is expected to show major growth over the next decade and there are several companies already producing 'nanoparticles'. Researchers in Japan have recently developed carbon nanotubes that, when mixed with resins, form a nanocomposite that has better conduction than conventional conductive resins. Samples have been produced and there are plans to commercialise the nanotubes early in 2005.²

There are many examples of future applications of nanotechnology under development:³

- Rapid testing of drinking water for harmful bacteria or toxins.
- Tiny sensors or cameras that can be inserted in the body without the need for invasive surgery.
- Micro-pumps that can deliver precise doses of medication directly to a cancer tumour or diseased organ. Sensors within the pumps could monitor the body and detect precisely when the drug needs to be delivered.

Other research projects include converting sand particles into glass at air temperature to encapsulate oil spills, radioactive materials and other wastes, and the development of tiny fuel cells as ultra-long-life batteries for portable electronics, cell phones and computers. High-performance, low-power micro-systems are replacing traditional electronics in telecommunications, leading to reduced energy usage and lower costs.

There are government nanotechnology initiatives in the UK, US, Taiwan, South Korea and Australia. However, Japan, Western Europe, and Russia are taking the lead in developing this new technology. China is also heavily involved in research.

Numerous research institutes are currently developing new applications or are already manufacturing various products, such as industrial coatings, pharmaceuticals, cosmetics, electronic components, and textiles.⁴

The Joint Centre for Bioethics in Canada recently published a report highlighting the rapid growth of nano research and development spending. By 2002, it was US\$604m in the US and in Japan it had reached US\$750m. However, the report's authors warned that advances in research were running ahead of the public's ability to comprehend their implications. "There is a danger of derailing nanotechnology if serious study of its ethical, environmental, economic, legal and social implications does not reach the speed of progress in the science," the authors said.⁵

FUTURE CONCERNS

There are various ways in which nanoscience could present unforeseen risk scenarios. Materials fabricated on the nanoscale have novel properties not displayed in normal, large-scale crystalline solids or glasses of the same chemical composition. They often have unusual electrical and optical properties because of the very precise way in which their atoms are arranged.⁶

For example, carbon in its nanosize can conduct electricity better than copper. This is known as the catalyst effect. In other cases the smaller particle size may cause the substance to be more toxic than in its normal form.

On the other hand, nanoscience may also have positive health implications. Gold particles are of particular interest as they may be used to kill off cancerous cells. Gold 'nanoshells' when injected into tumours and heated with infrared light, kill the cancer cells but do not affect the surrounding tissue.⁷

INSURANCE INDUSTRY IMPLICATIONS

Munich Re identified numerous potential liabilities from nanoparticles in a recent report.⁸ Among the scenarios it outlined: "Active nanotechnology products might be ... released during manufacture, endangering the lives of workers and the environment" and "taken to extremes, nanotechnology products could cause ecological damage which is difficult to contain."

The report identified several areas of new risk:

- fundamentally new types of loss scenario, resulting from new material properties such as magnetic fluids, which did not exist in the past.
- exaggeration of existing loss potentials as a result of changes to incidence and major claims risk.
- more stringent cases of liability as a result of changing legislation and jurisprudence designed to protect the consumer and/or the wider environment.

- new potential for adverse socio-political effects and irreversible ecological damage

The report points out that under legal jurisdictions which impose strict or no-fault liability the argument that users or manufacturers could not foresee a risk of loss due to the novel nature of the technology will be no defence. Clearly there are substantial implications for product liability insurers. Basic product recall could become a major issue. Nanotechnology is split between passive and active autonomous products. Development and design errors or faulty manufacture will be no more or less problematical than with other products in the case of passive nanotechnology. Active products, however, may have the ability to move around in the environment independently and in some circumstances may even be able to transform or replicate themselves. This will present a wholly different scenario in terms of loss control and containment. Another issue of concern will be whether it is feasible to 'tag' nano products with their origin and producer. If it is not possible, then in the event of an insurance loss, the manufacturer will not be traceable to identify liability.⁹

There remains no detector or sensor that can find some types of nanoparticles outside the laboratory. Some nano products are not found in nature and there is uncertainty about how they may develop and behave if introduced into the environment. For example, man-made 'carbon nanotubes' have a similar form, size and toxicity to asbestos and may be used as a substitute for silicon. However these particles are so small as to be able to pass through most barriers and filters, and nanoparticles have been proven to be able to evade the brain's defences against blood impurities. With greater potential to penetrate the skin, single cells and blood brain barriers than conventional pollutants, some types of particles could pose major health problems.

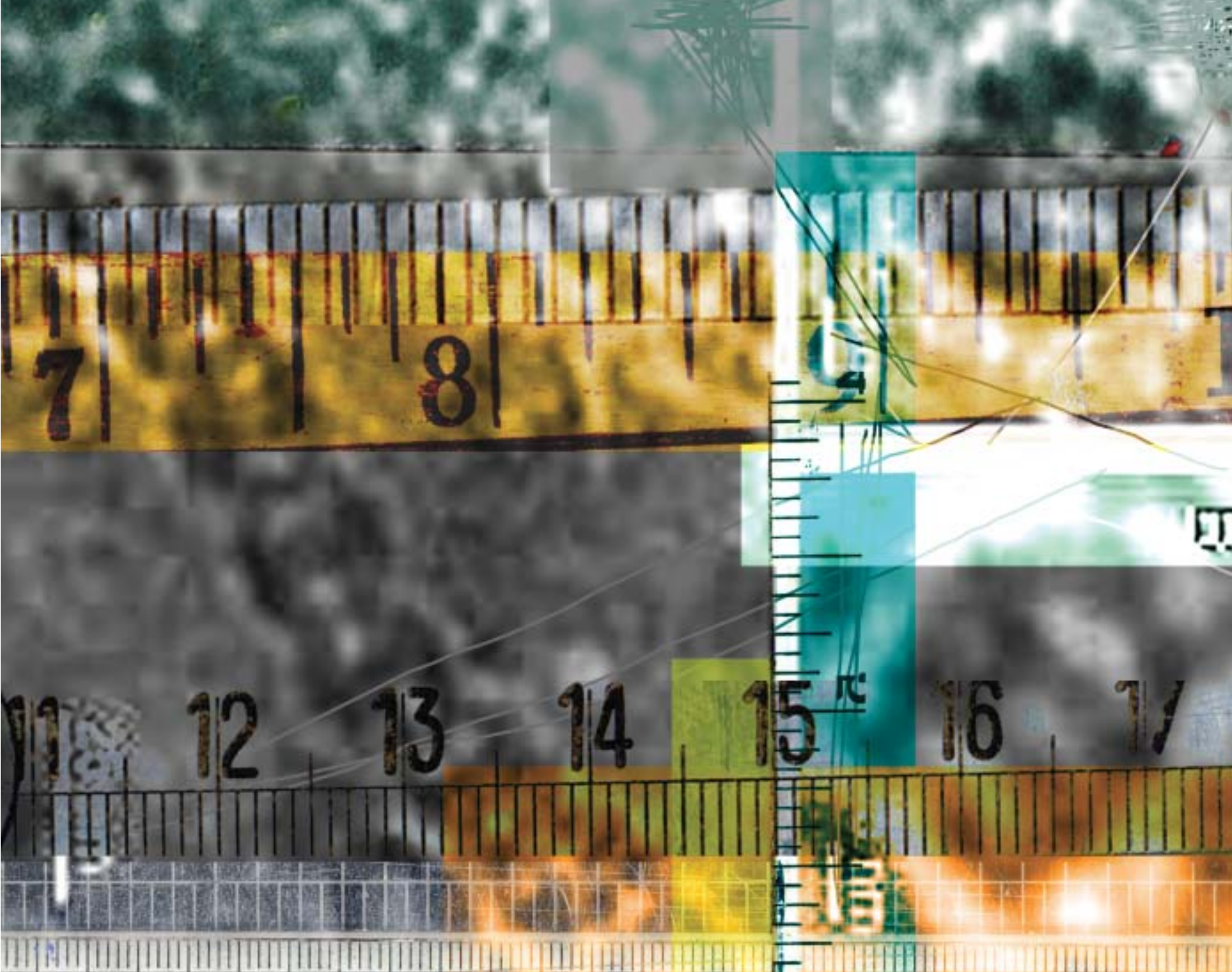
There are currently few, if any, regulations in force to control this new and rapidly developing technology. Future losses could be on a scale beyond anything ever experienced before by the insurance industry and there is the added possibility of causing permanent damage to the environment.

CONCLUSION

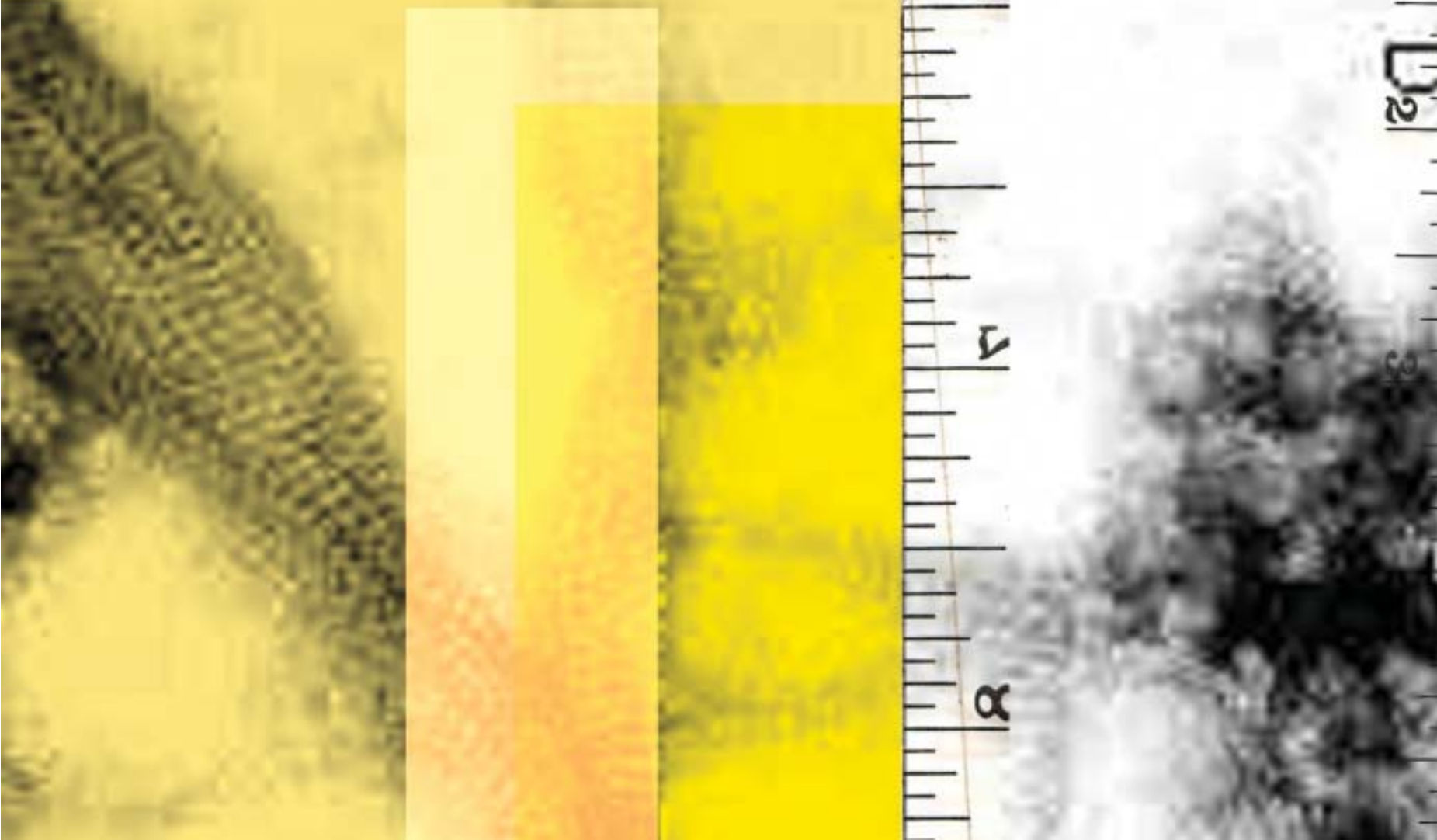
Nanotechnology offers massive economic potential. In 2001 alone, the world-wide market volume of nanotechnology applications was estimated at more than EUR55bn.¹⁰ The scope of this technology is almost endless. However, in terms of insurance and risk management uncertainties abound. Given that it is not possible to calculate potential claims, the industry's current focus is on risk management and containment, for example in the manufacture and transportation of nanotechnology.

ANDREA FRENCH – BENFIELD ACTUARIAL TEAM

¹ 'Nanoscience: University lands role in US\$70mn network for nanotech research', 19 January 2004. ² 'Conductive Resin (Nanomaterials), Advanced Composites Bulletin, 1 April 2004. ³ 'Developing a new world', Winnipeg Free Press, 23 November 2003. ⁴ 'US\$3.7bn nanotech bill sent to White House for approval', Time Union, 21 November 2003. ⁵ 'Sainsbury cool on 'nano nonsense'', BBC News website, 28 April 2003. ⁶ 'Tiny science is loss on UK public', BBC News website, 15 March 2004. ⁷ 'British Scientist: Nanoparticles might move from mom to foetus', Small Times, 14 January 2004. ⁸ Examples of nanotechnology risk, Munich Re Nanotechnology 2002 Report. ⁹ Some Environmentalists worry about nanotechnology risk', AP Online, 8 September 2002. ¹⁰ Ibid.



USING PARTICLES THAT ARE MEASURED IN NANOMETRES OR BILLIONTHS OF A METRE



In January we published 'Holding the Line'¹, our review of the reinsurance market and of year end renewals. Since then the reporting season for 2003 results and the Japanese 1/4 renewals have given further insight into market conditions. Post year-end renewal comments and the Japanese renewals have largely confirmed the conclusions of the 'Holding the Line' report, that challenging fundamentals and muted competition would maintain market discipline during 2004. Although property catastrophe rates have continued to soften, reinsurers remain selective. For example, the main trend in a generally uneventful April 1 Japanese renewal was a lower level of signing down (over-subscription) than had been seen at January 1 renewals in other markets. This reflected a greater willingness on the part of European reinsurers in particular to be selective about renewing lines at reduced rates, as well as some shifting of reinsurers within Japanese programmes.

Restructuring of programmes, with greater retention at lower levels but purchase of more cover on higher layers, was a common theme in most markets. This was partly due to cedants' improving results and stronger balance sheets, but for some US cedants also reflected changes in the PMLs predicted by commercial catastrophe models.

Casualty rates generally remain firm, as insurers and reinsurers continue to struggle with legacy issues from the more recent past (see 'Sins of the Past' earlier in this edition of B).

BERMUDIAN RENEWALS

Comments from the Bermudian reinsurers with their year end results endorsed Benfield's view that the 2004 renewal was disciplined, characterised by a stabilisation or modest

weakening of property rates, firm or increasing casualty rates and increased cedant retentions.² IPC's President and CEO, Jim Bryce, said that "renewals were conducted against a market backdrop of continued underwriting discipline, in which healthy conditions generally prevailed."³ Jim Stannard, Chairman and CEO of RenaissanceRe, was "somewhat disappointed" by the catastrophe market.⁴ He believed that total catastrophe premium had declined by "single digits" as clients retained more risk on lower layers in order to buy more cover on the higher layers. Patrick Thiele, President and CEO of PartnerRe, reported that "pricing remained strongest in casualty lines, with property pricing less so, while certain specialty lines, including catastrophe, showed some weakness in pricing."⁵ He also believed that there was a "growing trend by insurers to retain a greater portion of their risk."

Steve Carlsen, President of Endurance Reinsurance Corporation of America, said that property catastrophe "... held up better than we feared it might [and] softened modestly."⁶ He concluded that signs of competition were "moderate and more concentrated in property than casualty and more in working layers than catastrophe programmes."

EUROPEAN RENEWALS

The major European reinsurers also reported on their experience of renewals as part of their results presentations, as summarised in the Benfield IAR report 'European Reinsurance Renewal Roundup'.⁷ They too observed that, despite some softening of property pricing, discipline was maintained, and prices were generally adequate on a technical basis. Casualty rates continued to firm, while terms and conditions tightened, leading most players to increase their exposure to this class. New capital was not seen as generating

irrational competition, although the Bermudians were described as more aggressive competitors, particularly in casualty lines. The companies reported increased competition for adequately priced business, with signing down a feature, particularly in low frequency/high severity catastrophe lines that generate immediate calendar year GAAP profits in years of low loss activity.

As in Bermuda, more sophisticated models are being used to price business in Europe. Claims inflation and low investment returns are continuing to exert upwards pricing pressure. Each of the European reinsurers was adamant that it would not chase volume at the expense of adequate pricing and managing the cycle was a key theme. Hannover Re and Swiss Re, in particular, emphasised the need to be more opportunistic in the business written to maintain adequate levels of profitability.

There was continuing strong demand for reinsurance protection. Many programmes were restructured to provide clients with appropriate cover, but to contain cost, for example, by substituting non-proportional covers for proportional. The companies remarked that capacity was sufficient, except certain more difficult classes.

With only moderate claims inflation, and absent an abnormally high catastrophe loss burden, the European reinsurers forecasted a significant increase in profitability for 2004.

The European market is also an important target for the new Bermudians. During 2002 and 2003 several of them established subsidiaries or branches in Dublin, London and Zurich as part of their international portfolio-building plans. Europe is

STILL HOLDING

¹ See 'Holding the Line – Reinsurance Market and Renewals Review' Benfield IAR, January 2004. ² Ibid. ³ IPC Holdings Ltd press release 10 February 2004. ⁴ RenaissanceRe Holdings Ltd Q4 2003. ⁵ PartnerRe Ltd press release 9 February 2004. ⁶ Endurance Specialty Holdings Ltd Q4 2003 earnings conference call 23 January 2004. ⁷ 'European Reinsurance Renewal Roundup', Benfield IAR, March 2004. ⁸ PartnerRe Ltd Q4 2003 earnings conference call 10 February 2004. ⁹ Ibid. ¹⁰ XL Capital Ltd Q4 2003 earnings conference call 11 February 2004. ¹¹ Montpellier Re op cit.

an important market for PartnerRe and XL, both of which have substantial well-established operations domiciled in Continental Europe.

Most Bermudians were hoping to exploit the perceived dislocation of the European reinsurance market at January 1 renewals. The lowering of several European reinsurers' ratings in 2003 suggested scope for new competitors. However, while the European reinsurers saw the Bermuda players as being more aggressive, particularly in casualty, the Bermudians themselves observed that growth of new European business was not "as dramatic as anticipated."⁸

PartnerRe's President and CEO, Patrick Thiele, said that he had expected "more growth because of [PartnerRe's] strong ratings and . . . competitive dislocation in Europe" and noted some "potentially damaged competitors retained a fair amount of business." He attributed this to their negotiating skills and exploitation of long-term relationships, but was careful to emphasise that he didn't view the Europeans as "irresponsible in terms of pricing."⁹ Brian O'Hara, President and CEO of XL Capital, said there was some anticipation "that SCOR would not be a factor . . . in the market", but conceded that this was not the case.¹⁰ Jerry De St Paer, Chief Financial Officer observed that SCOR "did a little better in France from a nationalistic standpoint and to some extent in Germany" There had also been an expectation of a move to excess of loss (which would tend to benefit the Bermudians), but the Europeans did more proportional business than expected.

However, not all of the Bermudians' news from the European front was disappointing. Tony Taylor, President and CEO of

Montpelier Re, reported that the 2004 renewal season was "very active" with increased offerings on the international property account "especially in Europe".¹¹

JAPANESE RENEWALS

The Japanese renewals took place on April 1, against a background of lacklustre primary premium growth of only 0.1%, reflecting the continuing decline in motor premiums. Although the 2003 typhoon season was relatively quiet, there were three significant earthquakes for which (re)insurance losses continue to develop, as well as three substantial unrelated fire losses. However the combination of these losses was not sufficient to raise reinsurance rates, which were generally down by around 10% at renewal, although rates for peak exposures were down somewhat less.

As noted in the overview, the main trend in a generally uneventful renewal was a lower level of signing down (over-subscription) than had been seen at January 1 renewals in other markets. This reflected a greater willingness on the part of European reinsurers in particular to be selective about renewing lines at reduced rates, as well as some shifting of reinsurers within programmes. Given that market expectations had been for significant over-subscription, some reinsurers found themselves with somewhat larger lines than they had anticipated.

THE LINE



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