



International Association for the  
Study of Insurance Economics

# Geneva Association Information Newsletter

# 49

May 2011

## Risk Management

Research on Risk Management, Assessment and Prevention

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## **The Geneva Association**

The Geneva Association is the leading international insurance think tank for strategically important insurance and risk management issues.

The Geneva Association identifies fundamental trends and strategic issues where insurance plays a substantial role or which influence the insurance sector. Through the development of research programmes, regular publications and the organisation of international meetings, The Geneva Association serves as a catalyst for progress in the understanding of risk and insurance matters and acts as an information creator and disseminator. It is the leading voice of the largest insurance groups worldwide in the dialogue with international institutions. In parallel, it advances—in economic and cultural terms—the development and application of risk management and the understanding of uncertainty in the modern economy.

The Geneva Association membership comprises a statutory maximum of 90 Chief Executive Officers (CEOs) from the world's top insurance and reinsurance companies. It organises international expert networks and manages discussion platforms for senior insurance executives and specialists as well as policymakers, regulators and multilateral organisations. The Geneva Association's annual General Assembly is the most prestigious gathering of leading insurance CEOs worldwide.

Established in 1973, The Geneva Association, officially the "International Association for the Study of Insurance Economics", is based in Geneva, Switzerland and is a non-profit organisation funded by its members.

For more information please visit [www.genevaassociation.org](http://www.genevaassociation.org).

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### **The Research Programme on Risk Management**

The Risk Management Programme is an integral part of The Geneva Association's dialogue with economic and academic actors in order to emphasise the role of insurance in a modern service economy.

The focus of the Risk Management Programme is:

- to provide a platform between the insurance community, the engineering and academic communities, and policymakers to discuss issues on balancing risks and opportunities;
- to be a facilitator for the Chief Risk Officers (CROs) of The Geneva Association, and CROs in general;
- to foster the use of risk assessment tools and risk management in new fields of application, such as policymaking;
- to promote the concept of the insurability of risks as the "natural" borderline between State legislation and the market economy;
- to identify new opportunities for insurers in the emerging sustainability concept in order to enlarge the field of insurable and insured risks; and
- to research and illustrate the new risks in the emerging service economy, based on an extended performance responsibility of economic actors.

The main tools to achieve these objectives are:

- the **Risk Management Newsletter**, published biannually (see box hereunder);
- the **M.O.R.E. Seminars**, open to an expert public; the papers of the seminars are published in the series *Etudes et Dossiers*, and are available on The Geneva Association website;
- the **ART of CROs** meetings (Annual Round Table of Chief Risk Officers), open to Chief Risk Officers of The Geneva Association's members; and
- the Annual **CRO Assemblies** open to CROs from all insurance companies and related sectors, on invitation.

#### **The Geneva Association Information Newsletter—Risk Management, N° 49, May 2011**

Published biannually by The Geneva Association.

For information and suggestions, please write to the Editor at the Geneva office.

Printed copies: 3'900. Unrestricted circulation. Free of charge.

The opinions expressed in Geneva Association newsletters and publications are the responsibility of the authors. We therefore disclaim all liability and responsibility arising from such materials by any third parties.

Editor: Walter R. Stahel, The Geneva Association

Production Manager: Valéria Kozakova

Download the electronic version from: [www.genevaassociation.org](http://www.genevaassociation.org)

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**ISSN:1605-8240**

## EDITORIAL

*The team of The Geneva Association expresses its sympathies to the people of Japan for the loss and suffering experienced in the earthquake, tsunami and the subsequent disasters that have hit Japan. We convey our sincere condolences to the families of those who have lost their loved ones and colleagues, or are suffering from the aftermath of the natural catastrophes.*

### Risk Management in a World of Fuzzy Logic

by Walter R. Stahel<sup>1</sup>

This issue of the Risk Management newsletter discusses different facets of insurance's role in society and also touches on the question: who is in charge of risk? The Guest Editorial highlights the invisible hand of insurance and its friction with the political framework conditions. The events of 11 March in North-eastern Japan are the central theme which runs through many of the articles, culminating in a Special Contribution by Katsuo Matsushita, which is included as an attachment to this newsletter

The editorial looks at the dynamics of the risk landscape which, with its quicksand traps, sudden storms and nowhere to hide, increasingly resembles a desert. Within a short time, the risk landscape has seen "sudden and unforeseeable changes"—normally a definition for insurable risks—that may durably influence the borders of the field of insurable risks especially in industrialised societies.

**The first such change** is a questioning of Western science and a shift from risk and opportunity analysis and management to a general risk aversion led by the European media. Japan, with its history of dealing with geological hazards, has developed a different culture and attitude. Some of these factors post 11 March are described in the Special Contribution attached.

Risk management has traditionally been the art of making judgments in the absence of complete information. But, if in the past, risk was an issue for scientists and experts, sometimes accused of being biased by the people funding their activity, it has increasingly become the general public, often without basic knowledge, who discusses the issues on numerous blogs and social networks, such as Twitter and Facebook. In addition, politicians demand immediate action.

This development is accompanied by a number of other issues, such as:

- Events as a consequence of acts of God<sup>2</sup>, such as the nuclear disaster caused by the tsunami in Northern Japan, are no longer accepted as acts of God or *force majeure*.
- Risk assessment, risk perception and risk communication have been merged by the earthquake and tsunami of 11 March. Nuclear power stations in Europe now have to be checked for their vulnerabilities to earthquake and tsunami risks which are outside the scientifically possible.
- Techno-economic progress enables anybody to buy such instruments as Geiger counters, and to measure ever smaller concentrations of radioactive or chemical elements, which automatically are regarded as contamination. Concepts such as "natural background radiation", "legal thresholds limits" or "maximum admissible doses per unit of time" are ignored.
- Science is no longer "neutral". The "contaminated" vegetables banned in Japan as unfit for consumption (limit of 500 becquerel) could have been sold in Europe (with a limit of 1250 becquerel). To avoid a (hypothetical) import of irradiated vegetables from Japan, the EU lowered its own limit to 500 becquerel on 9 April 2011. These limits are supposed to be based on health considerations only.

Cultural and historical differences in dealing with risk become visible but are ignored and hardly analysed in the global media.

- Japan's historic familiarity and acceptance of geo risks and its discretion in dealing with suffering was apparent in the pictures and information in local media versus European ones after 11 March.

<sup>1</sup> Vice Secretary General and Director of Risk Management Research of The Geneva Association, [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

<sup>2</sup> Also called "the capriciousness of God", as a survivor of the Deepwater Horizon oil rig accident called it in the *Financial Times* of 05.04.11, "Macondo victims try to rebuild lives", p. 5.

- A village that was almost wiped out by huge flood of 11 March is the village where the term “tsunami” originated centuries ago. But the might of 11 March had no historic precedence.
- Previous research on the health impact of radiation has been ignored by the media.<sup>3</sup>

**The second change** is a new dynamic regarding what constitutes liability. Liability claims used to be based on principles such as causality. The closing down of nuclear power plants in Germany, based on a zero-risk interpretation of the precautionary principle, have led to attacks on the government by the utility companies for the resulting loss of income. In this case, the causality link is given, but will the German government pay?

Recent developments, however, tend towards a no-fault, causality-free interpretation of liability, for example with regard to climate change (e.g. the UNEP-Trucost report).

Courts are also part of this shift, reflecting a social vision of insurance:

- Deutsche Bank has been condemned to pay the losses of their clients from deals in derivatives, because of a lack of advice.
- The European Court of Justice has ruled sexual differences out of bounds as factor in pricing EU insurance policies.
- As per the Lex Column in the FT, “*other characteristics are already proscribed in many jurisdictions: race, sexual orientation or genetic information. Some US health insurance must now be sold without regard for the buyer’s current health*”.<sup>4</sup>
- In Japan, a tsunami may still be an act of God, but at some point in the downstream chain reaction, the effects of the tsunami are considered by the government as normal liability (Tepco was first ordered to compensate farmers, later all people in the 30 km evacuation zone).

These changes have attracted a rapid growth and diversification of “Litigation Funding” by third party investors, which could be another transforming force influencing the role of liability as a social, economic and regulatory force over the next decade, according to Richard Murray, head of the Liability Subcommittee of the Climate Risk and Insurance (CR+I) Project of The Geneva Association. Next in line may well be claims of global business interruption in just-in-time manufacturing chains caused by natural catastrophe (nat-cat) losses or subsequent power cuts in Japan, leading to shortages of electronic components and car parts in manufacturing plants in North America and Europe (see also p. 20).

Liability on a different level has hit the South African mining industry.<sup>5</sup> Acid water from abandoned mines and toxic dust from waste heaps are part of “heritage pollution”<sup>6</sup> from past mining activities which have started to haunt South African society; public health, workers compensation and drinking water pollution are among the most pressing topics. For heritage pollution that stems from the time before today’s environmental protection laws came into force, the government has to pay 70 per cent of the cleanup costs, the mining industry 30 per cent. There are 6,152 abandoned mines in South Africa, with no known owner. The South African government will therefore try to impose a liability on as many economic players as possible to cover the remediation costs.

**The third change**—possibly the most complex one—is in societal risks, a soft term for “sleeping risks”<sup>7</sup> in society resulting for instance from:

- Overwhelming sovereign debt in EURO-land and the U.S. could lead policymakers to redefine private sector liability in order to protect nation states near bankruptcy.
- Persisting youth unemployment can create a situation where people will become unemployable, leading ultimately to the emergence of “days of wrath” and riots in industrialised countries, similarly to Egypt and Tunisia, according to some experts<sup>8</sup>.
- The disappearance of the myth of proprietary or secret information might completely change the way we store and trade information and data.
- Green party solutions focused exclusively on single issues, such as mitigating GHG emissions, or abolishing the armed forces in Europe, may become new roots for uncertainty.

<sup>3</sup> Study by the U.S. Academy of Sciences on the health impact of the Hiroshima bomb, for example (see p. 16).

<sup>4</sup> The Lex Column; “Insurance and Society”, 11 March 2011, p. 14, *Financial Times*.

<sup>5</sup> Altlasten für Bergbaukonzerne, 15 April 2011, p. 28, *Neue Zürcher Zeitung*.

<sup>6</sup> The German language has this descriptive term “Altlasten”, or old charges, to describe heritage pollution.

<sup>7</sup> A term derived from the “sleepers”, well integrated individuals who suddenly turn into terrorists.

<sup>8</sup> “Warum die nächsten ‘Tage der Wut’ mitten in Europa stattfinden werden”, Christian Ortner, *Die Presse*, Wien, 11 March 2011, p. 31.

Another issue of societal uncertainty, the possible lack of legitimacy of the new world powers, will be detailed in the section MISCELLANEOUS INFORMATION AND PREVENTION NEWS on page 16.

### Reducing sovereign debt as an overruling priority

Hungary's nationalisation of the private pension schemes is an event which has already served as an example for other states, such as Poland. Both countries are Member States of the European Union.

President Obama's plan to reduce the national debt of US\$14 trillion by four trillion in 12 years has immediately triggered a political discussion of where to use the knife. Budget cuts in Greece and Portugal have led to the development of default options for sovereign debt in EURO-land, as well as social unrest.

The "National Flood Insurance Program" in the U.S., which is billions of dollars in debt and faces other problems, must be overhauled, lawmakers agreed.<sup>9</sup> The next step could be to look at the insurance sector's deep pockets of reserves. "There is no question the programme is in dire need of reform", said Rep. Judy Biggert, chairman of a House Financial Services Subcommittee, at a hearing. The programme expires 30 September but there is still no consensus on how to fix its problems, which include repeated claims involving the same properties and premiums that are widely subsidised. Legislative proposals to mandate participation and raise premiums are contentious; raising premiums without requiring people to buy flood insurance could drive more property owners out of the programme.

### Persistent youth unemployment<sup>10</sup> and rising poverty among OAPs

France has a population of 65 million, of which 26 million are working. Of the non-working population, about eight million are in the age group of 16 to 26 years of age—the cohorts that should take the place of the elderly people near retirement. But of the 16-26 year olds, a third "does not fit" because the people cannot read nor write, do not speak sufficient French and are not familiar with French manners. One third of the 16-26 year olds is equal to 2.6 million young people, or 10 per cent of the total working force. They may never enter the labour market, accumulate pension rights or pay taxes.<sup>11</sup>

Equally disturbing is persistent unemployment of university graduates. This has triggered the riots in Egypt and Tunisia, but is also systemic in south European countries, notably Greece, Italy and Spain. China also has started to be affected by the frustration of highly motivated university leavers who cannot find employment corresponding to their education, despite China's booming economy.

The situation of pensioners in many countries may not be brighter.<sup>12</sup> Thirty-five per cent of people planning to retire in the U.K. this year will do so with incomes below the poverty line, according to new research from Prudential.<sup>13</sup> Prudential's Class of 2011 study surveyed people intending to retire this year and revealed that 19 per cent will retire on an annual income of less than £10,000 a year. Gender and geographical differences make things worse:

- Women planning to retire this year are even more likely to have incomes below the poverty line. Forty per cent of women retiring in 2011 will have a pension income of less than £14,400 compared with 30 per cent of men. Prudential's research also found that 26 per cent of women compared with 12 per cent of men will retire this year with less than £10,000 a year to live on.
- People planning to retire in Wales and south-east England this year are most likely to face retirement poverty. Forty-two per cent in Wales will do so with an income below the poverty line with 27 per cent expecting an income of less than £10,000. In the south-east of England 39 per cent of those planning retirement in 2011 will do so with incomes below the poverty line and a quarter expect to live on less than £10,000 a year.

The situation in Germany has been described<sup>14</sup> as two trains which left the same station in the 1970s and which will crash into each other around 2025: sovereign debt and demographic development.

<sup>9</sup> *Florida today*, 28 March 2011, from <http://www.floridatoday.com>.

<sup>10</sup> *Persistence of High Unemployment—What Risks? What Policies?* from <http://www.oecd.org/dataoecd/8/36/47656668.pdf>.

<sup>11</sup> Figures from the 7th Annual Meeting of the OECD LEED Forum on Partnerships and Local Governance, Vienna, 10 – 11 March 2011.

<sup>12</sup> Source: Prudential Press Release.

<sup>13</sup> To meet its minimum income standard the Joseph Rowntree Foundation estimates that a single person in the U.K. needs at least £14,400 a year, yet 35 per cent of those retiring in 2011 will retire with an income below this level, up from 32 per cent in 2010.

<sup>14</sup> Ederer, Günter (2011) *Träum weiter, Deutschland! Politisch korrekt gegen die Wand*, Eichborn Verlag Frankfurt.

These are but a few isolated European examples of sleeping risks. Yours truly is fully aware that worse situations exist in other regions of the world. Willis Group has highlighted another aspect of this issue in their paper *Global: Political violence prods insurers into re-examining terms of business*.<sup>15</sup> This situation is worrying and is explored by other research programmes of The Geneva Association (Third Pillar and Silver Workers, Life and Pensions). The “competition for young brains is discussed” on p. 7.

### The myth of proprietary information

Secrecy has always been violated by some to gain an economic advantage or power over other people or organisations. Among them are criminals, corrupt officials and secret service agents, but also commercial data dealers such as credit information agencies (e.g. Dunn & Bradstreet) and private investigators.

But the public knew that using public systems, such as letters sent by postal mail and calls over fixed phone lines, was safe, thanks to a State guarantee and a State punishment for abuse.

Recent political and technological developments have changed this situation:

- German *Länder* (regional states) have bought several CD-R with clients' data stolen by criminal employees from Swiss and Lichtenstein banks. The payment of several million Euros was justified with the argument that the economic benefit (taxes recovered from tax dodgers) far outweigh the monies paid to the criminal thieves. This example of “theft by the State”, as it has been termed by some observers, might in the future be used to justify any case of industrial espionage and evade accountability and prosecution.
- The members of WHO, the World Health Organization,<sup>16</sup> have decided on a more equitable access to vaccines at a meeting on 16 April 2011. Pharmaceutical companies receiving viruses through the WHO laboratories, to manufacture vaccines, will in the future have to pay half the annual costs to run these laboratories (US\$56 million). In addition, the pharmaceutical companies will have to give part of their profits from vaccine sales to LDCs,<sup>17</sup> for instance by donating vaccines or by giving WHO free licences. This agreement, which attacks existing Intellectual Property Rights, will be governed by the General Director of WHO (see “legitimacy of the new world powers”, p. 17).
- Corporations are increasingly victims of cyber attacks leading to data theft. One of the latest victims in the U.S. is RSA,<sup>18</sup> a major seller of digital security solutions (SecurID) for online banking systems. RSA believes that data theft today is undertaken by professional organisations, not hackers. The advancement of cloud computing could open the door for data theft in the context of industrial espionage.
- The latest example of a massive data breach happened beginning of April 2011 when a computer hacker penetrated Epsilon, an online marketing unit of Alliance Data Systems Corp. sending more than 40 billion e-mail ads and offers annually. Next came the hacking of Sony's Play Stations.
- We can also cite the uncertainty which the appearance of Styxnet and other new generation viruses has added to the insecurity of industrial IT applications not connected to the Web.
- Users of Facebook who put personal pictures and messages on the Web for their friends, in their “personal file”, discovered that they could not remove embarrassing files, or stop third parties from using the data.
- Wikileaks has “published” thousands of confidential e-mails from the Pentagon and U.S. embassies.
- In Austria, two dozen court officials have sold confidential data to interested parties – and Austria is not regarded as one of the corrupt European countries. In other countries, tax authorities sell the names and addresses of taxpayers sorted by income groups or profession to marketing organisations.

On the other hand, it has become easier to detect theft of proprietary data, such as plagiary quotes from publications (copyright violation). The German minister of defence zu Guttenberg and Saif Gaddafi both lost their PhDs at the beginning of 2011 when it was discovered that they had copied text from older publications. Plagiarism has always been done, but Internet has made it first extremely easy to do, then to detect. The latter is becoming a new social pastime.

<sup>15</sup> From <http://www.asiainsurancereview.com/pages/e-weekly.asp?country=10&articleID=13815#13815>.

<sup>16</sup> “WHO-Mitglieder beschliessen Schaffung eines gerechteren Zugangs zu Impfstoffen”, *NZZ* 18 April 11, p. 16.

<sup>17</sup> LDCs, Less Developed Countries or emerging countries.

<sup>18</sup> RSA, The Security Division of EMC, provides Secure Data, Compliance, SIM, SEM, Consumer Identity, and Access solutions to over 90 per cent of the Fortune 500 companies

Consumers are not aware that, in contrast to conversations over fixed phone lines, mobile phone conversations are inherently unsafe. Tens of thousands of smartphone users in the U.S. have downloaded applications which later stole their data; and 120,000 attacks took place on iPads through AT&T's servers in the first year of their introduction. Apple is also accused of tracking its iPhone users.

We don't have estimates of what the disappearance of the concept of proprietary information could mean for insurance or the economy as a whole. However, any (insurance) company outsourcing the treatment of sensitive data could become a potential victim of blackmail, similarly to Swiss banks.

A new use of proprietary information is made by such new powers as Google and will be discussed in MISCELLANEOUS AND PREVENTION NEWS, p. 16.

### **The catastrophe potential of 'green'-only policies, as opposed to a sustainable systems approach**

Green politics focused exclusively on mitigating GHG emissions, such as producing ethanol to replace gasoline or diesel fuel for vehicles<sup>19</sup> or aircraft, often create a competition with food. Corn, soya and wheat have experienced exploding (food) prices in the last few months worldwide. Higher oil prices will accelerate this market shift from food to ethanol. And green solutions may not sell. Germany's efforts to make its roads greener by introducing a new biofuel called E10 have so far fallen flat. Consumers just haven't accepted it. Manfred Lebmeier, Sustainability Expert at Allianz Germany, explains what happened and why he thinks electric cars are a better option.<sup>20</sup>

Contradicting green policies can also create stalemate situations. In many countries, such green technology as photovoltaic panels on roofs and windmills on mountain tops increasingly face resistance by green interest groups wanting to protect the natural heritage. The same green interest groups oppose the construction of new hydroelectric power stations and new overhead electricity transmission lines, except if the latter are built underground (at a much higher cost). Yet these technologies are among the main green alternatives necessary to compensate a nuclear exit strategy.

Another green policy, abolishing armed forces, may deprive nation states of the only efficient organisation to combat the aftermath of natural catastrophes and other extreme events. Economic actors simply cannot afford to have a surplus of trained labour—or to own and operate the heavy equipment—needed in catastrophic events. After the tsunami of 11 March, tens of thousands of Japanese and 20,000 U.S. soldiers were sent into the devastated region to find and rescue victims. And as already in 2004 in Sumatra and Thailand, the most enabling technology to support the rapid interventions to save lives have been U.S. aircraft carriers. These floating cities have their own hospitals, drinking water production, radio communication systems and airfield, in addition to huge supplies of fuel and food and thousands of disciplined and highly trained experts and medical specialists—and they can anchor close to the devastated shores. Of all the disaster management options, armed forces may be the ultimate tool. NATO has recognised this potential and identified crises management and cooperative security as its new strategic concept, in addition to collective defence.<sup>21</sup>

Similarly to C.P. Snow's "Two faces of science", politicians may have to better understand the two faces of armed forces and of nuclear technologies. Germany's plan for a "nuclear exit" will be an exit from opportunities only, not from risks, according to Patrick Lagadec's 1981 book *La civilisation du risquée* and Ulrich Beck's 1987 book *The Risk Society*.

### **The perception of technology risks after 11 March**

Have the waves of the tsunami of 11 March been a "Black Swan" (see also p. 20)? A number of researchers deny this, because modelling this chain risk event would have forecast the outcome.<sup>22</sup> The events have sent ripples around the world, and created a surge need for information that nobody foresaw. 11 March hit at a time when many politicians, in an effort to reduce GHG emissions, discovered their love for nuclear energy because of its low-carbon nature, and when most car manufacturers fell in love with e-mobility. The six nuclear reactors that went out of control in Fukushima Daiichi may have abruptly ended these love affairs.

<sup>19</sup> The *European Directive* 98/70/EC of 13 October 1998 relating to "The quality of fuel and setting a quality standard for fuel ethanol, containing 5 – 10% ethanol".

<sup>20</sup> From [http://knowledge.allianz.com/?1462/future-mobility-biofuels/&wt\\_mc=nl.2011.link2.kw18](http://knowledge.allianz.com/?1462/future-mobility-biofuels/&wt_mc=nl.2011.link2.kw18).

<sup>21</sup> NATO's Strategic Concept is available at [www.nato.int](http://www.nato.int) and its discussion forum through [natostrcon.info](http://natostrcon.info).

<sup>22</sup> E.g. Manfred Schneider, author of *Das Attentat. Kritik der paranoischen Vernunft*.

If nuclear reactors in Europe should be decommissioned before the end of their technical lifetime, and the plans for new reactors shelved, the results are foreseeable and could be modelled—but there is no political incentive to do so.

- Electricity prices will soar in all European countries due to the threat of scarcity. Electricity prices will also rise because additional high voltage overhead transmission lines will have to be built to shuttle electricity between regions.
- Prices of other energy, such as oil, gas and coal, may also rise due to speculation<sup>23</sup> and increased demand, so the risk of a soaring inflation may show its ugly face again.
- Electricity shortages will entail voluntary black-outs as experienced in Japan, or speed reductions for high speed trains as imposed in China.
- The GHG emission reductions promised under the Kyoto Protocol by its signatories will be out of reach if coal- and gas-fired power stations jump in to reduce the risk of widespread power cuts. This could relegate the post-Kyoto negotiations to the back burner.

Different issues will emerge on the industrial policy side after an exit from nuclear power:

- Dreams of battery-powered electric automobiles will die a sudden death, leading to stranded capital and technology lock-in issues as well as rising CO<sub>2</sub> emissions.
- Some industries may move to countries with guaranteed power supplies, others will install private diesel-fuelled power generators already installed for mission-critical applications in hospitals, for instance, as is current practice in LDCs.
- The civil nuclear energy technology, research and market power will focus on South Korea, China, Russia and the U.S. that have all declared to continue constructing new nuclear power stations. Some small states may also jump in, such as Libya and Iran.

These changes will affect the economy as a whole and may give the insurance industry the opportunity to rethink its role in society. Among the potential issues are:

- The discussion about risks and opportunities resulting from science and technology should be a broader one and include a systems approach to society, which includes ethics and values.<sup>24</sup>
- On the risk side, inflation threatens pensions and life insurance, power cuts will trigger business interruption claims, investments into clean technologies may go into default.
- On the opportunity side, applications of existing technologies that can deliver high electricity efficiency, such as demand-controlled pumps and water-cooled IT servers, may take off. Applications of so far unpopular non-carbon energy sources, such as geothermal and hydrogen, might soar. The Hydrogen Economy<sup>25</sup> based on fuel cells will receive a push for stationary applications (buildings) and automobiles, the hydrogen-powered London taxis for the 2012 Olympics. These existing technologies will also gain a considerable cost advantage.
- Many of the extreme events caused by chain reactions described above have been deliberately accepted in order to achieve a higher (short-term) economic efficiency: centralising production to achieve economies of scale, leading to a globalisation of production; just-in-time production reduces storage costs but increases the vulnerability of the manufacturing chain. Another sign of this globalisation is the fact that world trade, as measured by the WTO, has increased fourfold between 1990 and 2010.

On a different level, the trend to replace democratic with bureaucratic regimes will influence insurance, which recently has become visible in several ways, see MISCELLANEOUS AND PREVENTION NEWS. Risk will remain a moving target, which makes our work so interesting.

I look forward to your comments.

**Walter R. Stahel, Editor**  
Vice Secretary General and  
Director of the Risk Management Research Programme  
The Geneva Association

<sup>23</sup> See for instance “Glencore reveals grain price bet”; in *Financial Times*, 25 April 2011, p. 1, and [www.ft.com/foodprices](http://www.ft.com/foodprices).

<sup>24</sup> Angela Merkel's commission on the nuclear energy question in Germany should have a broader view on risks and opportunities of science and technology progress.

<sup>25</sup> J. Rifkin (2002) *The Hydrogen Economy*, Tarcher/Putnam.

## GUEST EDITORIAL

### The Invisible Hand of Insurance

by Dr Hans Peter Würmli<sup>26</sup>

*The social responsibility of business is to increase its profit.*

Milton Friedman<sup>27</sup>

The recent disaster in Japan was exceptional. The extremely high magnitude Tohoku earthquake triggered a devastating tsunami, which not only wiped out the existence of thousands, but also caused the worst nuclear accident since Chernobyl at the Fukushima Daiichi nuclear power plants. We must ask ourselves if this was a case of risk management gone wrong, or if this was one of these rare but possible low probability events remaining.

Let me ask the question differently: what have off-shore oil drilling in the Gulf of Mexico, the operation of nuclear power plants in Japan and occupational pension plans in Switzerland in common?<sup>28</sup> First I shall give the short answer. Those without the fortitude can then forego the more detailed explanations that follow!

All three are representative of huge societal problems and all three either lack appropriate insurance or violate important insurance principles in their chosen solution. In all three cases, the insurance community has failed, in my opinion, to convince the public of the benefits of insurance to society and, equally, legislators have failed to regulate appropriately. The insurers' skills, knowledge and expertise to design, place and maintain appropriate insurance covers are not recognised adequately by society. Not only are their risk management skills not appreciated, but worse, insurers and pension schemes are burdened with a large part of the huge cost of regularly occurring monetary easing, jeopardising part of their business model and risking their long-term survival.

Let me highlight just three decisive strengths of the insurance community: the ability and independence to assess risk, including judgements as to the limits of insurability; the capacity to create insurance products to internalise external cost, e.g. of dreaded events; and, most important of all, having the right incentive to impose provisions and measures to manage risk exposures that can render dreaded events more unlikely. Where society uses the insurers' services, the public's trust does not need to rest on some blurry hope for better and more competent experts, but it can rely on their profit incentive and loss disincentive that risk is assessed and dealt with objectively. The invisible hand of insurance operates to a great part with the transparency that is created by its activity. That's the short answer.

If insurers and banks were to compete for popularity, insurers would lose with the public, even in the light of the recent financial crisis. We are faced with a peculiar situation: the insurers' business model has proven sustainable, largely because insurers know how to quantify risk and how to set up appropriate technical provisions. On the other hand the banks' business model of transforming terms and the reserve system of fiat money regularly crash, prompting governments and central banks to loot taxpayers and the insurers' and pension schemes' funds to "save" the banking system and the "economy". There are of course politically correct terms to describe this: "rescue of the payment system", "active fiscal policy", "quantitative easing" among many others. This type of monetary policy takes place by large scale manipulation of bond and other investment instruments' prices by central banks, made possible by the availability of sheer unlimited resources of money. The interventions since the 2007 credit crisis deprive insurers of instruments with the appropriate risk-return levels. By ignorance or ill intentions, the insurers' business model, if not their existence in the long run, is destroyed. To make matters worse, this does not appear to trigger discussions or outcries from the insurance industry. This might be because it perceives itself as frail in the arena of public opinion. A notable exception to this was the ZFS Chief Economist's and CRO's opinion published in the *Wall Street Journal*.<sup>29</sup>

<sup>26</sup> Chairman of the CRO Network of The Geneva Association.

<sup>27</sup> *New York Times Magazine*, 1970.

<sup>28</sup> All three examples are representative for similar situations in other regions of the world and, of course, there is an abundance of further examples sharing the same trait.

<sup>29</sup> D. Hofmann and A. Lehmann: "The Sweet Poison of Low Interest Rates, Fiscal pump priming and quantitative easing also impose costs", *The Wall Street Journal*, 18 January 2011.

What makes insurance so valuable in a modern division of labour based economy? Insurance can address the agency dilemma or, as it is also called, the principal-agent problem better and more effectively than any other institutional set-up. Risk managers know the principal-agent issue and its risk management mostly in the form of the risk owner—risk taker—risk controller relationship. The visible role of the risk controller lies in providing second opinions and independent views. The less visible role of the controlling activity is the beneficial disciplining effect it has on risk-taking resulting mostly from the gain in transparency.

In our democracies we split political power into the executive, legislative, and judiciary power to address principal-agent problems. Where governments see their role as principal, the institutional set-up of choice is often a government agency, be it an “energy agency” or an “insurance supervisory authority”. But in many situations other ways exist to monitor principal-agent relationships. Let us look at a concrete example. Our post-industrial service economies are still run on a lot of primary non-renewable energy. Society, or governments at its place, acts as a principal when it tasks energy firms, the agents, to produce the energy we need. This of course runs costs and the lower the costs, the lower the price of energy for society, at least when there is sufficient competition. But as is foreseeable, in this simple set-up only costs internal to the system are priced. How could we take account of all the cost that can arise to society or the environment, say, of possible oil spills, nuclear accidents, breaking dams or air and water pollution? We require that all possible threats should be considered, their full cost taken into account, liabilities clarified and the contingent finance assured. My claim is that private insurance would do all this better than any other institutional set-up. The profit incentive will drive insurers, but the loss disincentive will be an even stronger guiding hand.

Modern insurance is the brainchild of Enlightenment, even if most are unaware of it. The Lisbon Earthquake of 1755 was the key event for the new way to think about catastrophes. It brought the insight that we humans cannot influence earthquakes and tsunamis, but that we can manage our exposure to them by, say, building differently or at different places. Enlightenment thus brought us a rational approach to dealing with the vagaries of nature and humans alike. Another breakthrough of the time was the invention of an adequate institutional setting, letting corporations and citizens alike enjoy legal certainty. Adam Smith's “invisible hand” and a merchant's “*laissez-nous faire*” plea to mercantilist Colbert exemplify well how enlightened citizens of the time saw the economic needs best served. In a modern ordoliberal understanding, the invisible hand would lead the self-interested agents best by being guided by adequate regulation.

Insurance activity by no means only amounts to collecting premiums and paying claims, but an essential part of the activity is the assessment of risk, designing the proper products, defining the constraining clauses and requiring the necessary precautionary measures. Private insurance is entrusted with the insurance of many of our personal and business risks. “Private” indicates that the prices and products result from either free negotiation or from free choice among competing suppliers. Insurance activity has created legions of underwriters, actuaries, marketers and sales persons, investment and claims specialists, as well as the insurance firms' managers that all have learnt to manage risk in its diverse facets. When insurers quantify risk they use models, but at best, these models can be appropriate for their chosen purpose. Good theories can only be falsified, never proven true and so models can never be “validated”, but only deemed appropriate. However, our judgement does not need to be based on blind trust in insurers' expertise. If regulation sets up the institutional framework properly, insurers have to “put their money where their mouth is”, i.e. the incentive for more profit is restrained by the disincentive to suffer unexpectedly high losses if their models are inadequate for the risk.

Even though insurance is a success story and the industry has a proven track record to adequately assess and manage risk, why then does it not get entrusted with solving our societies' mega problems? Why instead of being praised is the insurance industry confronted with mistrust and are its solutions doubted? One can only speculate on the reasons for this. Maybe the insurers' rational realism destroys dreams by tagging risks with the right prices. One shoots the messenger who debunks the dreams of cheap nuclear power or oil from the deep sea, who exposes the true cost of long life or unmasks the consequences of unlimited access to medical services. Where insurance proves successful and sustainable, its successes however are taken for granted. Successful insurance activity benefits society and insurers alike. But increased insurers' profits bring envy instead of gratitude. Milton Friedman's statement quoted above is hardly unanimously accepted.

No doubt, with targeted public campaigns, marketing and also lobbying work, the reputation of insurance can be improved and its mechanisms explained. The industry will have to be open and transparent about its inner workings to gain the public's reluctant trust. This appeal for transparency grows out of risk managers' experience in corporate environments. The most successful solution for many risk management issues is transparency, because the exposed reality often speaks louder than words. Because creating transparency and openness within the firm has a highly beneficial effect, it is promoted in all the emerging solvency regulation, with the aim of engaging market discipline in managing risk. One of the most important transparency measures within companies as well as at the regulatory level was the requirement for market-consistent valuations of assets and liabilities; only values reflecting economic reality allow good judgements and appropriate decisions by employees, clients and competitors alike.

The same applies for insurance. The invisible hand of insurance is not mysterious, but can be explained by our insights into human behaviour and how to bring the best out of it with appropriate incentives and disincentives. Insurance requires and brings transparency into principal-agent relationships, thereby exposing the true cost of risky projects. If insurance had made the potential cost of failed or sloppy risk management more transparent, would failed projects such as the Deepwater Horizon platform or the Fukushima Daiichi nuclear power plants have taken a different course? Would insurance have required more effective and cautious approaches as precondition for insurance? Failures can never be excluded, but where experience exists, as is the case with the well-defined and reasonably tight liability for oil rigs and pipelines in the North Sea, insurers can be confident that they have a beneficial impact on the incidents and the course of catastrophes. Thus, we can see that the invisible hand of insurance can work to the great benefit of society.

Let me close with an awfully topical quote from James Madison: "*A popular government, without popular information, or the means of acquiring it, is but a prologue to a farce or a tragedy; or, perhaps, both.*"<sup>30</sup>

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#### *Note by the Editor*

The "reputation of insurance" quoted by Hans Peter Würmli above may become a key factor in the increased competition for the best brains, as the age pyramid turns into an age apple tree. Insurance is an intangible activity which is invisible to young people. We thus need to actively sell the professional careers within insurance activities before students have made up their mind of what they want to do. One solution could be a variety of temporary jobs as interns to familiarise young people with the jobs within insurance and make insurance more visible and attractive.

Other activities have a similar problem of intangibility, such as space activities. In the U.S., 25 per cent of the space specialists will retire within the next few years. In Russia, 10 per cent of the space specialists are between 70 and 80 years of age. Space activities will therefore soon go into a hiring spree. The lasting economic value of space activities are untold but easy to sell: health, emergency, security, environment, information—people are unaware that Internet (including Google and websites), GPS, Google Earth, mobile phones, earth imagery and satellite-based photography on TV, withdrawing money at an ATM on another continent, are impossible without satellites—e.g. space technology.

The lasting economic value of insurance activities may be more difficult to sell. Insurance and space technologies are both enablers of modern life—but we are not selling it to young people and our customers.

In "*Citadel*", Antoine de Saint-Exupéry's last book, the poet-author explains that if you want to build ships, do not call people together and buy materials, but give people a longing for the sea—"*créer la pente vers la mer*"! Can we do the same for insurance?

<sup>30</sup> Quoted from the American Constitution Society website: Why Government Transparency is Vital to Democracy. Also the following explanation can be found there: "*In fact, the notion that government should be open to public scrutiny and criticism dates back to the Enlightenment when intellectuals criticized state secrecy. The idea of a free press stems from this view.*"

## CALLS FOR PAPERS

The Management of Risk in the Economy (M.O.R.E.) and Climate Risk and Insurance (CR+I) seminars are key tools in the dialogue with economic actors, academics and policymakers in order to emphasise the role of insurance in a modern service economy. Calls for papers are launched early on; papers should help to broaden the scope of the topics beyond the “known unknown”. All presentations will become available to participants on the password-protected part of The Geneva Association website [www.genevaassociation.org](http://www.genevaassociation.org), and will also be published in the *Etudes & Dossier* series.

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### Call for Papers for the 3<sup>rd</sup> CR+ I Seminar

#### **Interactions between the Private Sector and Asian Policy-makers on Mitigation and Adaptation for Extreme Events and Climate Risk, 18-19 October 2011, NTU Singapore**

The Geneva Association is organising the 3<sup>rd</sup> CR+I Seminar jointly with the Institute of Catastrophe Risk Management (ICRM) in the Nanyang Technological University, Singapore. The seminar language is English. The Seminar will be structured in four workshops of four presentations of 20 minutes, followed by 20 minutes of discussion.

#### Draft Programme

The Seminar is structured into four workshops over two days.

Day 1	Interactions between the Private Sector and Asian Policymakers
Workshop 1	Opening the debate on Interactions between the Private Sector and Asian Policymakers on Mitigation and Adaptation
Workshop 2	ICRM will organise this workshop on a topic to be decided
Day 2	Opportunities and risks of extreme events and climate risk
Workshop 3	organised by The World Bank on Resilience to Extreme Events in Indonesia
Workshop 4	Potential Contributions by the Insurance Industry on adapting to Climate Risk in Asia

The 3<sup>rd</sup> CR+I Seminar will focus on the Insurance Industry and resilience to extreme events and climate risk in Asia and south-east Asia

Climate change brings new risks but also new opportunities for the economy in general and the insurance sector. The impact of climate risk on Asian regions could be severe and disproportionate with regard to its per capita greenhouse gas (GHG) emissions.<sup>31</sup>

The potential impacts of climate risk call for mitigation and adaptation measures. These differ according to a country's topography, demography and degree of economic development.

**If you would like to submit a presentation**, please send an abstract, preferably before the end of June 2011, to [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

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### **Call for Papers for the LOICZ<sup>32</sup> Open Science Conference 2011 (OSC 2011) Coastal Systems, Global Change and Sustainability, 12-15 September 2011, Yantai, China, <http://www.loicz-osc2011.org>**

- Session Proposals: that explore a common theme in depth.
- Oral Presentations: on state-of-the-art science, practical experience, and advanced decision making and governance.
- Posters: that illustrates coastal research and practical applications addressing the OSM themes.
- Young LOICZ Forum: oral and poster presentations from doctoral students and young researchers.

**Abstracts should be submitted electronically** by email to [osc@loicz-osc2011.org](mailto:osc@loicz-osc2011.org), or online at the conference website: <http://www.loicz-osc2011.org>.

<sup>31</sup> See also: Y. Kameyama (2008) *Climate Change in Asia, Perspectives on the Future Climate Regime*, UNU Press, Tokyo.

<sup>32</sup> Land-Ocean Interactions in the Coastal Zone, an ICSU Project (International Council of Scientific Unions).

## FUTURE RISK MANAGEMENT CONFERENCES

### Seminars organised by The Geneva Association

The annual M.O.R.E. Seminars (Management of Risks in the Economy) have been an integral part of The Geneva Association's Risk Management Programme for the last 25 years. The CR+I Seminars (Climate Risk and Insurance) started in 2009 and are held annually on topics related to managing extreme events including climate risk.

These seminars are a key tool in the dialogue with economic actors, academics and policymakers in order to emphasise the role of insurance in a modern service economy. They are open to a maximum of 50 participants in order to foster an exchange of views. Presentations are limited to 20 minutes, followed immediately by 20 minutes discussion for the same reason.

The language of the seminars is English. All presentations will become available to participants on the password-protected part of The Geneva Association website [www.genevaassociation.org](http://www.genevaassociation.org), and will also be published in the *Etudes & Dossier* series.

Experts interested in participating can register at any time by sending a fax or letter to The Geneva Association or an email to [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

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### The 3<sup>rd</sup> CR+ I Seminar “Interactions between Private Sector and Asian Policy-makers on Mitigation and Adaptation for Extreme Events and Climat Risks” 18-19 October 2011, Singapore

The Seminar will be structured in four workshops, each workshop contains four papers. A call for papers can be found on p. 10. Participants can register at any time by sending an e-mail to the convener, Walter R. Stahel at [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

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### The M.O.R.E. 25 Seminar organised with, and sponsored by, Axis Re, Bermuda on Modelling and Mapping Risks and Opportunities (MMR+O 2) 12–13 July 2011—Bermuda Underwater Exploration Institute (BUEI), Bermuda

Applications of Modelling and Mapping Risks and Opportunities (MMR+O) relevant to the insurance industry have rapidly developed since 1990, thanks to advances in computer sciences and the availability of dedicated software and super computers. MMR+O has an important role to play in the development of scenarios in many different areas. This second seminar will broaden and deepen the subject of MMR+O and its applications linked to the insurance industry. The programme follows.

Experts interested in taking part should send an e-mail to the event manager, Rosemary Cresswell at [rosemary@redcompleteevents.com](mailto:rosemary@redcompleteevents.com) and the convener Walter R. Stahel at [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

#### Day 1, Tuesday, 12 July 2011—Issues beyond those currently considered by insurance

9.00 **Welcome and opening** by Walter R. Stahel, The Geneva Association

#### Workshop 1 MMR+O on geographic topics

9.15 **Special Lecture—The New Economic Loss Model**  
Professor Roger Pielke, University of Colorado, U.S.

10.40 **Forecasting Tropical Cyclones: A Market-Based Forward-Looking Approach**  
Jack S.K. Chang, Professor of Finance, California State University, Los Angeles, U.S.

11.20 **The impacts of Sea Level Rise on Coastal Cities**  
Professor Robert Nicholls, University of Southampton, U.K.

**Workshop 2 MMR+O on socio-economic topics**

- 13.30 **Taking Preventive Actions on Early Warnings for Occupational Risks**  
Johan Gort, Research Manager, TNO, The Netherlands
- 14.10 **Economic and Societal Impacts of Tornadoes**  
Kevin M. Simmons, PhD., Professor of Economics, Corrigan Chair of Economics and Business Administration, Austin College, U.S.
- 15.20 **Exploring Rapid Change, Implications of Emerging Technology in Terms of Risk and Uncertainty**  
Professor Brad Allenby, Arizona State University, U.S.
- 16.00 **Potential and risks in geothermal energy exploration**  
Professor Eva Schill, University of Neuchatel/Neuenburg, Switzerland
- 16.40 **My Experience with Ushahidi, Crisis Mappers and UN Global Pulse**  
Patrick Meier, Co-Founder and Co-Director of the International Network of Crisis Mappers, San Francisco, CA, U.S.
- 17.20 Wrap-up by the Chair
- 20.00 Conference Dinner

**DAY 2, Wednesday, 13 July 2011—Issues with a strong insurance industry focus****Workshop 3 MMR+O in management applications**

- 8.30 **Introduction by the Chair**, Robert Muir-Wood, Senior Scientist, RMS London, U.K.
- 8.40 **Forecasting Liability Outbreaks**  
Dr Robert T. Reville, RAND Corporation, U.S.
- 9.10 **A Vision of the Future of Modelling**  
Kim Holmes, Head of Modelling, XL Group, Bermuda
- 9.40 **Topic tba**  
David Bassi, Managing Director, Casualty, Swiss Re America Corp, Manchester NH, U.S.
- 10.40 **Strategic Decisions Utilizing an Enterprise Risk Model**  
Akira Higuma, Chief Risk Officer, Tokio Millennium Re Ltd., Hamilton, Bermuda
- 11.20 **Practical Use of Complex Systems Approaches for Modelling Risk Appetite and Mapping Emerging Risks**  
Neil Allan, Founder and Fellow of the University of Bristol and Bath Systems Centre, U.K.
- 12.00 **Risk Management: The Art of Using Model Certainty and Uncertainty**  
Dr Pierre Wiart, Risk Manager, Sirius Bermuda

**Workshop 4 MMR+O in the context of nature and the environment**

- Chair Walter R. Stahel, The Geneva Association
- 14.00 **Climate Risk and Insurance: Changing the Design of Underwriting and Decision Making for our Industry**  
Dr Gero Michel, Willis Re, London, U.K.
- 14.40 **How should We Quantify and Price Uncertainty in Risk Modelling?**  
Lixin Zeng, PhD, President, Validus Research Inc., Bermuda
- 15.50 **The Modelling Lessons of the New Zealand and Japan Earthquakes**  
Robert Muir-Wood, Senior Scientist, RMS London, U.K.
- 16.30 **An open and informed discussion on what the events of 11 March 2011 and the following days in Japan mean for risk modelling** (Tohoku earthquake and tsunami, followed by the problems in nuclear reactors)
- 17.30 End of the M.O.R.E. 25 Seminar

<b>Other Future Risk Management Conferences</b>
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**3<sup>rd</sup> iNTeg-Risk Conference 2011,  
"Risk vs. Risk: Managing Emerging Risk Tradeoffs in complex systems",  
6-8 June 2011, Stuttgart, Germany**

in conjunction with SRA-Europe 2011 Annual Meeting, iNTeg-Risk workshops/courses and iNTeg-Risk ES Seminar.

Venue: Haus der Wirtschaft, Willi-Bleicher-Strasse 19, 70174 Stuttgart, Germany

The conference is an excellent opportunity for project partners to communicate their results to the "outside world" and an opportunity for interested professionals, not participating in the iNTeg-Risk project, to learn about the project, budget approximately €20 million, with 80+ companies involved.

For more details, see [www.integrisk.eu-vri.eu](http://www.integrisk.eu-vri.eu).

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**Assessment, Governance and Management of Water in a Changing World:  
Innovations and Integration of Science and Technology from Global to Local Scales,  
13-15 September 2011**

Conference organised by the Global Water System Project (GWSP) of the Federal Ministry of Education and Research of Germany. Details on [www.gwsp.org](http://www.gwsp.org).

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**8<sup>th</sup> Geneva Association Health and Ageing Conference on  
Insurance and Dementia Diseases,  
14-15 November 2011, Toronto, Canada**

Co-organised with Sun Life Financial

The next Geneva Association Health and Ageing conference will focus on dementia diseases, their current and future cost and the role of insurance in covering this risk.

Dementia is a progressive, degenerative condition that affects memory, thinking, behaviour, emotion and day-to-day functioning. As dementia prevalence increases with age, dementia is becoming one of the greatest challenges facing our ageing societies. In 2010, an estimated 35.6 million people were living worldwide with dementia. This number is expected to increase to 65.7 million in 2030. No curative treatment for dementia exists, nor for prevention. The ability to care for people with dementia depends on a mix of formal and informal caregiving. Support for people with dementia can be both tiring and stressful—physically, emotionally and financially. Many countries may not be well prepared to provide quality health and care services for people with dementia and their family care givers.

Dementia has a potentially devastating impact on public health systems because it is among the most disabling of all chronic diseases. How this trend translates in terms of costs in public health will vary greatly depending on the country and the mix of care provided.

Insurance can help cover the risks linked to dementia and various products are already offered on the market, either via health insurance or long-term care insurance. Insurance can also play a role in developing the care for demented people, either by integrating care services into their benefit or by investing in nursing care centres or other specialised institutions.

The conference will be organised around various sessions, including the epidemiology of dementia and risk profiles, care and cures for dementia, financing and organising the coverage of dementia, insurability of dementia and insurance market.

Participants will come from insurance and reinsurance companies, universities, international organisations and related institutions. The conference will only comprise a limited number of participants to guarantee an active exchange of opinions and animated discussions.

If you are interested in participating at or contributing to this conference, please contact Christophe Courbage at [christophe\\_courbage@genevaassociation.org](mailto:christophe_courbage@genevaassociation.org).

## PAST RISK MANAGEMENT CONFERENCES

### Conferences sponsored by The Geneva Association

**The 1<sup>st</sup> Asian Climate Change Summit**  
**“Tackling Climate Change—Being Ready to Face Threats and Opportunities”**  
 16-18 January 2011, Singapore

Organised by Asia Insurance Review and The Geneva Association, sponsored by Swiss Re.

Speakers of the 1<sup>st</sup> Asian Climate Change Summit included

Tan Yong Soon, Permanent Secretary (National CC), Prime Minister's Office, Singapore  
 Patrick M. Liedtke, Secretary General and Managing Director, The Geneva Association,  
 Switzerland

Jan P. Mumenthaler, Head, Insurance Services Group, Business Risk Department, IFC, U.S.  
 Dr Anthony Knap, President and Director, Bermuda Institute of Ocean Sciences, Inc.  
 Shailendra Yashwant, Campaign Director, Greenpeace Southeast Asia  
 Mitsuru Muraki, General Manager, CSR Division, Tokio Marine & Nichido Fire Insurance  
 Company, Japan.

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**16<sup>th</sup> International Conference on Space Activities Development**  
**(Risk Management and Insurance Implications)**

6 - 8 April, 2011—Parco Dei Principi Grand Hotel, Rome, Italy

Organised by Pagnanelli Risk Solutions Ltd and co-sponsored by The Geneva Association

Details on <http://www.pagnanellirs.com/index.html?pg=10&id=8>

Space activities are multiplying at local and international levels. New space agencies have been set up in many countries. Scopes are further diversifying from the current prevailing utilisation, which is tele-communications. Now, security, navigation control, disaster monitoring, climate change, weather forecast, and tourism are new issues attracting public and private sector attention.

How to better develop and protect these activities in a world economy full of worrying shadows is a subject of great concern at all levels. The 16<sup>th</sup> International Space Conference gave an update on the expansion of space activities through presentations by space agencies, conditioned by public procurements and entrepreneurs supported by private initiatives and investors. Innovative technologies were extensively considered, together with issues such as social and human aspects connected with space utilisation and exploration.

Highlights were the risk management of space projects and insurance solutions to protect the big financial commitments of the sector. Among the many supporting and participating companies were ESA, NASA, JAXA, China Great Wall, ASI, UK Space Agency, Arianespace, Mitsubishi.

The participants were from public authorities, industries, investors, users, scientists, lawyers, universities, press and, obviously, insurance brokers and companies from most countries of the world.

The conference on space activities produced a number of take-aways:

- One satellite manufacturer compared satellites to cars, except that satellites are switched on and then drive for 18-20 years without a pit stop, oil change or refuelling.
- On the retirement of the space shuttle: compare it to racing a 30-year-old Ferrari but without the possibility to intervene in case of a break-down. Cars are scrapped at half the age of the shuttle.
- The speaker from NASA pointed out the coming competition for the best brains, In the USA, 25 per cent of the space specialists will retire within the next few years. In Russia, 10 per cent of the space specialists are between 70 and 80 years of age (see also commentary on p. 7).
- Space activities and insurance are invisible enablers of techno-social progress (telemedicine).
- Space has become a driver of innovation and innovative (private sector) start-ups, and is still pushing the frontiers of science further, witness the new space telescope.

The space conference has again presented horizons and achievements which are untold in the media.

**NEW MAJOR PUBLICATIONS BY THE GENEVA ASSOCIATION**

## Journals

***The Geneva Papers on Risk and Insurance—Issues and Practice*****April 2011**

Papers in the April 2011 (GPP 36(2)) issue of the journal study the issues of: best-practice adoption versus innovation and their influence on European life insurers' productivity; what motivates insurers to use derivatives, using evidence from the United Kingdom life insurance industry; demutualization, control and efficiency in the U.S. life insurance industry; risk margin estimation through the cost of capital approach; a traffic light approach to Solvency measurement of Swiss occupational pension funds; value relevance of embedded value and IFRS 4 insurance contracts; and, assessing adequacy of retirement income for U.S. households, using a replacement ratio approach.

Founded in 1976 and published quarterly by Palgrave Macmillan, *The Geneva Papers on Risk and Insurance—Issues and Practice* publish papers which both improve the scientific knowledge of the insurance industry and stimulate constructive dialogue between the industry and its economic and social partners. It is essential reading for academics and researchers in insurance, insurance industry executives and other professionals who are searching for a deeper insight into the strategic options for their sector. It bridges the gap between these groups, highlighting overlapping areas of interest and providing mutually beneficial research and dialogue.

## Books and monographs

The Geneva Association is pleased to announce its recent publication:

***Considerations for Identifying Systemically Important Financial Institutions in Insurance—A contribution to the Financial Stability Board and International Association of Insurance Supervisors' discussions***

Edited by Daniel Haefeli, Head Insurance and Finance, The Geneva Association and Patrick M. Liedtke, Secretary General and Managing Director, The Geneva Association

The report is based on a series of background papers and special presentations on systemic risk in insurance created between March and June 2010. It summarises the insurance industry's thinking—as advanced and crystallised by The Geneva Association—on these areas which include both corporate activities (e.g. asset management) and regulatory measures (e.g. crisis resolution mechanisms). The respective research was conducted by member companies of The Geneva Association's Systemic Risk Working Group: Allianz, Aviva, AXA, MetLife, Munich Re, and Swiss Re, as well as The Geneva Association itself. As such, the following report constitutes a further development of the analysis of the role of insurance for financial stability and represents an integral part of the industry's position on systemic risk in insurance as originally laid out in the 26 February 2010 report.

## Call for Papers

***The Geneva Association is pleased to announce a special issue on Climate Risk and Insurance*** In *The Geneva Papers on Risk and Insurance – Issues and Practice* (April 2012)

We encourage you to submit contributions related to this topic. All contributions will go through a refereeing process.

Papers should be submitted electronically via the website of *The Geneva Papers* (<http://gpp.msubmit.net/cgi-bin/main.plex>) by **1 September 2011** at the latest.

For further information on this special issue, please contact Samantha Solida at [samantha\\_solida@genevaassociation.org](mailto:samantha_solida@genevaassociation.org)

## MISCELLANEOUS INFORMATION AND PREVENTION NEWS

*This section presents a selection of topics, studies and ideas worthy of a wider discussion chosen by the Editor, who welcomes remarks and comments from readers.*

### The (non)lessons of past nuclear radiation incidents

The dramatic events following the 11 March tsunami which crippled the Fukushima Daiichi nuclear power plants are not the first incident which exposes populations to high levels of radiation. But from a literature research, it seems that neither the sad experiences of Hiroshima, Nagasaki nor Chernobyl have found a wide scientific interest. And no records seem to be publicly available on the development of the radiation levels over time.

In 1945, a profoundly sad experiment in public health began when U.S. forces dropped a 13-kiloton nuclear fission bomb on Hiroshima, Japan. Three years later, President Harry Truman ordered the National Academy of Sciences<sup>33</sup> to study<sup>34</sup> the long-term health effects of radiation on roughly 100,000 survivors. A 100,000 more perished in the blast and its immediate aftermath. As the most rigorous research of its kind, the Life Span Study of the Hiroshima cohort, published in 1994, now guides almost all responses to major radiation disasters, including the recent near-meltdown at the Fukushima Daiichi reactors in Japan. Yet its findings seem to have been ignored completely in the breathless reporting, over the past few weeks, of radiation contamination—even in the United States.<sup>35</sup>

A number of Japanese radiation research centres provide some historic information and positions with regards to the Fukushima Daiichi accident:

- Radiation Emergency Medicine Promotion Center, at <http://wjrempan.nerf.jp/english/index.html>.
- Radiation Effects Research Foundation; the official website of the foundation has been revised to include information relating to the troubled Fukushima Daiichi nuclear power plant damaged by the 11 March tsunami that struck off the northeast Pacific coast of Japan's Tohoku region, more information at [http://www.nerf.or.jp/index\\_e.html](http://www.nerf.or.jp/index_e.html).
- A third website gives detailed data from 1959 to 2006 but the information is in Japanese only, [http://psv92.niaes3.affrc.go.jp/vgai\\_agrip/samples](http://psv92.niaes3.affrc.go.jp/vgai_agrip/samples). The data concerns the density of 90 Strontium (Sr) and 137 Caesium (Cs), the number of samples, the maxima and minima, on the west coast (Sea of Japan), the Pacific coast and for the whole of Japan.<sup>36</sup>

In Chernobyl, only one study seems to have been done after the accident (but no longitudinal study of the Chernobyl disaster's survivors<sup>37</sup> was undertaken). Its conclusion was that the accident at the Chernobyl nuclear power plant in 1986 was a tragic event for its victims and those most affected suffered major hardship. Some of the people who dealt with the emergency lost their lives. Although those exposed as children and the emergency and recovery workers are at increased risk of radiation-induced effects, the vast majority of the population need not live in fear of serious health consequences due to the radiation from the Chernobyl accident. For the most part, they were exposed to radiation levels comparable to or a few times higher than annual levels of natural background, and future exposures continue to slowly diminish as the radionuclides decay. Lives have been seriously disrupted by the Chernobyl accident, but from the radiological point of view, generally normal prospects for the future health of most individuals should prevail, according to this report.

A second 2006 report on Chernobyl gives an independent scientific evaluation of health and environmental effects 20 years after the nuclear disaster provides a critical analysis of the report by the International Atomic Energy Agency (IAEA) and The World Health Organization (WHO).<sup>38</sup>

For the 25-year anniversary of the Chernobyl accident, several teams of reporters from BBC radio<sup>39</sup> and television visited the damaged core and control room of the nuclear plant. They did not have to

<sup>33</sup> From Wikipedia, at [http://en.wikipedia.org/wiki/Atomic\\_Bomb\\_Casualty\\_Commission](http://en.wikipedia.org/wiki/Atomic_Bomb_Casualty_Commission).

<sup>34</sup> *Radiation Research* 137, 368-397, from <http://www3.cancer.gov/intra/dce-old/pdfs/ciabs.pdf>.

<sup>35</sup> Sanghavi, D. Tiny Nukes, "How dangerous are small doses of radiation?" <http://www.slate.com/id/2291272/>.

<sup>36</sup> Ryoichi Nakai from the Tokio Marine London office has kindly provided an English translation of the data.

<sup>37</sup> <http://www.unscear.org/unscear/en/chernobyl.html>.

<sup>38</sup> United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) (2011), from <http://www.chernobylreport.org/?p=downloads>.

wear protective clothing or breathing equipment. It seems that the main danger now comes from the toxic dust on the floor of the plant. Recent TV broadcast also included interviews with some of the 3,000 workers and 300 elderly people who returned soon after the accident to their houses, and the Easter mass which has been celebrated in the orthodox cathedral of Pripjat for many years.

### **2011 Tohoku Earthquake Web Platform to Support Researchers and Science Projects**

A new web platform was established in response to the massive Tohoku earthquake and tsunami disaster to intensify and support scientific research activities between Japan and Switzerland. As a single entry point, the site will provide a platform for coordinating relief efforts via scientific ties and lists open positions for visiting Japanese researchers and students, lab facilities available to Japanese partners as well as dedicated research initiatives and funding resources. ETH Zurich is already a contact point for cooperation of bilateral projects between Switzerland and Japan and is now hosting the new platform. See <http://www.global.ethz.ch/stc/japan/support>.

### **Applying the lessons learnt from the Yokoshima Daiichi accident to other risks**

An increased risk perception in the public at large could be one positive result of the nuclear incident of 11 March if applied to all goods. Applying the logic of the safety checks on nuclear power stations in Europe—thinking the unthinkable under absolute transparency—would mean, for instance, that crash tests with automobiles will have to be done at the maximum speed of each car, rather than at a standard speed of say 50 kilometres per hour. To allow for transparency, the results would have to be put on the websites of the manufacturers and the consumer associations.

**Future Global Shocks: Can we cope with the challenges?**<sup>40</sup> A forthcoming report by OECD, the Organisation for Economic Co-Operation and Development, Paris, [oecd.org/futures](http://oecd.org/futures)

This OECD Futures project covers a particular class of large scale disasters or catastrophes: those which reach a global or near-global scale. This is not to say that local, national or regional disasters cannot have huge damaging consequences but that a “global” shock is a different animal. Perhaps, as an emerging class, global shocks deserve special attention since they are frequently confused with large scale disasters as soon as characterisation, frequencies, propagation, impacts or key policy challenges are discussed.

The OECD International Futures Programme has just completed a two-year project on *Future Global Shocks* with active contributions of eight governments, the private sector and the research community to provide clarification, views on the future and a better understanding of policy challenges and options.

During the course of the project, a number of dimensions were covered: knowledge base about potential shocks (typology of shocks, data and models); assessment of a sample of potential global shocks such as pandemics, financial crisis, cyber security, social unrest, geomagnetic storms; discussion on available tools, regulatory gaps, policy options. The five reports on case studies can be found on [oecd.org/futures](http://oecd.org/futures). Questions about frequency, drivers, direct or indirect impacts, role of models, access to resources, interoperability of instruments, role of actors and many others were raised.

Eventually, the question of “commonalities” between potential threats as opposed to idiosyncrasies is key when it comes to policy options: are there priorities that governments, the private sector and society should endorse whatever the case? It can be argued that to a large extent the answer is yes. But each potential case, in its own right, can justify specific measures in line with more general principles.

The OECD report is expected to be published by June 2011. It will be available on the e-bookstore of the Organisation. Subsequently a number of presentations will be made in capitals and international fora. The five case studies will also be published in paper versions thereafter.

### **The (lack of) legitimacy of the new world powers**

Western democracies are built on a few simple principles such as “no taxation without representation”, which was later refined by Max Weber, Hannah Arendt and other philosophers. Most of them were Europeans; possible Eastern influences by, for instance Confucius, are not often mentioned.

<sup>39</sup> Oral communication from Richard Hollingham, journalist and broadcaster, who was in Chernobyl for BBC.

<sup>40</sup> Information by Pierre-Alain Schieb, Counsellor, Head of Futures Projects, [pierre-alain.schieb@oecd.org](mailto:pierre-alain.schieb@oecd.org).

Over the last decades, a number of alternative world powers have surfaced in the Western world, such as civil society and NGOs, or such websites as Wikileaks, seemingly spontaneously, which no longer seem to respect the origins of legitimacy of modern democracy. They often claim to represent society as a whole and to be substitutes for a non-functioning democracy, which seems to be supported by the fact that few question their legitimacy.

Jacques Julliard, a leading journalist of the French left, recently changed jobs and admitted that the civil society was an orchestrated attempt of the political left to reconquer terrain lost in democratic elections. Juillard complained that<sup>41</sup> *“the core function of civil society, which was for years our hallmark and rallying cry, ceased to promote our ideas a long time ago”* (see footnote for the original text).

The civil society consists mainly of NGOs, many with a few 10,000 members concentrated in a few countries. Yet NGOs play an increasingly important role in U.N. negotiations, such as the annual Conference of Parties (COP) on Climate Change.

When NGOs act as whistleblowers or bottom-up developers of quality of life, this poses no problem—whistleblowers have always been highly motivated individuals trying to correct hidden faults in a power structure, often risking their own position at the same time. And improving the quality of life of the disadvantaged has a long tradition in, for instance, health and schooling—think of Albert Schweitzer. Animals and rainforests have no voice and no parliament to speak out for them. However, when NGOs speak “for the people”—remember Maggie Thatcher’s *faux pas*: *“I want to speak to my people?”*—the question of legitimacy arises. NGOs acting as lobbying organisations represent the interests of a specific microcosm with a hidden agenda to defend their “clients”; the need for transparency and legitimacy thus applies.

Which jurisdiction oversees the Internet? Who controls the quality of information on the web or the rulers of the digital world, the use and sale of information collected by these new information brokers?

- Wikileaks has “published” thousands of confidential e-mails from the Pentagon and the U.S. embassies, being the only judge on what should be made publicly available or not. But Mr Assange, the creator of Wikileaks, now wants to sue the journalists who have published books on discussions with him because he considers that the journalists violate his privacy.
- Wikipedia’s editors have access to all information including the secret (?) passwords of the anonymous authors who submit texts, and judge what is fit for publication—but not based on quality of contents. These dealings are hidden, but sometimes come to light by accident. Witness the following discussion on the Editors’ Wikipedia entry—the link is given below: *given that the only edits so far are by Retlaw lehats, and given that that username is “Walter Stahel” with the letters reversed, there appears to be a clear conflict of interest in this article.*<sup>42</sup>
- Google Street View has been recorded and put on the web without consultation of, for instance, the real estate property owners filmed and put on the web. For any burglars, it is the equivalent of the drones used by the U.S. army for recognition and attacks in foreign territories because the camera at 2.5 meter above ground give a much better insight than a personal visit.
- Google Books has scanned and put up for sale millions of digitalised books with a potential disregard of existing authors’ copyrights. A recent U.S. court order has questioned the legitimacy of Google Book’s approach and the contracts imposed on authors after an alleged violation of their copyright.

Other information accessible through, or available in the public domain, is copied and commercially exploited by economic actors of the private sector. The question of legitimacy arises in all these topics.

The European Commission is now reviewing Europe’s data protection law and will come forward with new proposals this summer. The Justice Commissioner told journalists that European citizens’ rights vis-à-vis data collection needed to apply regardless of where the data were collected. Websites including Google and Facebook operating from the U.S. but targeting consumers in Europe will be bound to follow tighter EU privacy and data protection rules.

<sup>41</sup> Jacques Julliard, Introduction ‘la révolution capitaliste et les tâches nouvelles du socialisme’, dans « Vingt thèses pour repartir du pied gauche », *Libération* 18 Janvier 2010: « Le primat de la société civile, qui a été, durant des années notre marque de fabrique et notre mot de ralliement, ne sert plus depuis longtemps à faire avancer nos idées ».

<sup>42</sup> [http://en.wikipedia.org/wiki/Talk:Walter\\_R.\\_Stahel](http://en.wikipedia.org/wiki/Talk:Walter_R._Stahel), accessed 17 March 2011.

## The legitimacy of governance

Who is in charge of risk in a democracy? Who are the partners on the political side for interactions between the private sector and policymakers? This question has arisen in the work of the CC+I (Climate Change and Insurance) Project, now renamed CR+I (Climate Risk and Insurance) Project, which at the same has been given a new objective of “Sustainability, resilience to extreme events and climate risk”.

Who is in charge of democratic nations in normal times? Recent publications<sup>43</sup> have raised the question with regard to the European Commission. Robert Menasse has concluded that democracy was a concept of the 19<sup>th</sup> century which cannot be applied to the supranational problems of the 21<sup>st</sup> century. He considers Brussels to be an “enlightened bureaucracy” with a democratic deficit. Already at the foundation of the European Communities, it was agreed that the population will not be consulted already in decision-making, and budgets are decided by the Council of Ministers, not the European Parliament. Yet at the same time, Brussels demands its Member States to apply the subsidiarity principle of decision-taking at the lowest level.<sup>44</sup> The democratic deficit is thus an incapacitation of the citizen, the classic rule of “no taxation without representation” having been abolished (Enzensberger). In 1975, Hannah Arendt had warned in her famous Copenhagen speech of “*the pressure on nations to change for bureaucracies where anonymous offices and computers replace legislation and people*”.<sup>45</sup>

In his Special Communication, Katsuo Matsushita points out another answer to the question of “who is in charge”. “*Coordination among governmental agencies in Tokyo (after 11 March) was also insufficient because of DPJ’s motto: ‘politicians, rather than bureaucrats, should lead everything’.*”

The United Nations and its organisations often take a similar attitude to Brussels (see also WHO’s attitude on p. 4). According to Daniel Bodansky<sup>46</sup>, “*international agreements vary widely in the latitude that they give participating states. Some take a top-down approach, defining particular policies and measures that parties must undertake. Others adopt a more bottom-up approach, allowing each participating state to define its own commitments unilaterally. In the climate change regime, the Kyoto Protocol reflects the top-down approach. Although it gives states freedom in how they implement their commitments, it does not give them similar flexibility in defining the form, nature and content of their commitments. Going forward, the climate change regime faces a choice: continue the top-down road blazed by Kyoto, or shift to a more bottom-up architecture, focusing on nationally-defined measures. Although the Copenhagen Accord and Cancun Agreements in theory leave this question open, they embrace a bottom-up approach, allowing countries to make national pledges unilaterally.*”

The trend to replace democratic with bureaucratic regimes or courts has an influence on insurance, which has become visible in several ways recently, reflecting a social vision of insurance:

- The UNFCCC analysis of climate change problems linked to health, social and economic development ignores the limits of insurability, and accuses the insurance of inactivity: “*There is not enough activity from the insurance industry which has been lagging in the adaptation process (a lot of movement but no action). Also negotiating parties are missing the knowledge regarding the input that insurance can offer. Now it is a time for a more active approach from the insurance part to lead by example and find the ways how private and public initiatives can synergise*”.<sup>47</sup>
- The UNEP/Trucost report on GHG emissions liability, to be paid from the profits of profitable corporations, indirectly promotes unprofitable ones and state-owned companies, which at times are exempt even if major polluters!

The European Court of Justice ruled sexual differences out of bounds as a factor in pricing EU insurance policies. “*The European Court of Justice has decided that it is more just to ignore factors correlating with differences in the probability of making a claim. The legislators’ approach reflects a social vision of insurance: it is a way to share the burden of ill fortune. The bigger the pool of policyholders,*

<sup>43</sup> Hans Magnus Enzensberger (2011) *Sanftes Monster Brüssel oder die Entmündigung Europas*, Suhrkamp, preprint in *Der Spiegel* 9/2011 (Brussels, the soft monster, or the Incapacitating of Europe), and Robert Menasse, [http://en.wikipedia.org/wiki/Robert\\_Menasse](http://en.wikipedia.org/wiki/Robert_Menasse).

<sup>44</sup> Switzerland is probably the only country which systematically applies the subsidiarity principles on all issues.

<sup>45</sup> <http://gunnarsohn.wordpress.com/2010/02/03/wehrt-euch-gegen-die-eurokraten-kauft-gluhbirnen-in-bosnien/>, 21 March 2011.

<sup>46</sup> Daniel Bodansky (2011) A tale of Two Architectures: the Once and Future U.N. Climate Change Regime; <http://ssrn.com/abstract=1773865>.

<sup>47</sup> Youssef Nassef, from the Adaptation Committee of UNFCCC at a workshop in London 17 January 2011.

the more equitable the system. Insurers search for another sort of justice: accurate pricing for the probability of making a claim".<sup>48</sup>

"The decision on 1 March 2011 by the European Court of Justice to ban underwriting by gender will have profound implications on a number of markets". While much of the media commentary on the ruling has focused on general insurance, especially motor, David Trenner considers in this article its potential impacts on annuities markets as well as the policyholders they serve, and describes how the changes relate to the wider reforms that are taking place in the U.K. pensions and retirement landscape.<sup>49</sup>

Other jurisdictions are not much different. "Other characteristics are already proscribed in many jurisdictions: race, sexual orientation or genetic information. Some U.S. health insurance must now be sold without regard for the buyer's current health".<sup>50</sup>

### Managing extreme chain reaction events

Nassim N. Taleb wrote the bestseller *The Black Swan: The Impact of the Highly Improbable* on the role of the high-impact rare events ("Black Swan") across philosophy, economics, finance, engineering, cognitive science, and history.<sup>51</sup> But when Black Swans become repetitive, or are not sudden and accidental, these are no longer unforeseeable events.

The chain reactions triggered by the earthquake and tsunami in Northern Japan are unprecedented in their volume and reach. But some of these chain reactions were deliberately constructed in order to achieve a higher (short-term) economic efficiency: centralising production to achieve economies of scale in a global production model; just-in-time production to reduce storage costs increased the vulnerability of the whole manufacturing chain.

The winter storms in Europe led to similar risk chain reactions. In the very beginning, airports were shut down because of the snow covered runways. After a few days the runways had been cleared for landing and take-off. The lack of products to de-ice the aircraft then became the reason for airport closures. These special alcohols are produced centrally and delivered to the airports "just-in-time" by tanker lorries via motorway. When the snow chaos shut down the motorways; the de-icing liquids could no longer be delivered and the aircraft were stuck on the ground. Once the available space to park aircraft was taken up, new aircraft could not land, and European air traffic came to a halt because the de-icing liquids could not be delivered. In some countries, roads and motorways could not be cleared as salt supplies were kept minimal because stocking salt all year round is expensive—and not necessary in clement winters. Some airlines are taking action against British airport operators for loss of income.

Economies of scale always lead to diseconomies of risk, according to Matthias Haller from St. Gallen University, Switzerland. But economic actors are driven by profit maximisation, not loss prevention. One of the tasks of national CROs could be to identify chain reaction events based on diseconomies of risk. A new approach is also Resilience Engineering (see p. 26, *Resilience Engineering in Practice—A Guidebook*).

Another potential task for national CROs has been identified by Patrick Lagadec, Professor at the *Ecole Polytechnique de Paris*, author of the 1981 book "*La civilisation du risque*". In a disaster report analysing the aftermath of Katrina, he writes that all members of the disaster management team were well prepared but under shock as they had personally lost their houses or beloved ones. He proposes the creation of Rapid Reflection Forces, trained to develop creative and innovative solutions in chaotic situations, which are brought in at the beginning of a catastrophe. Checklists are useless in situations of uncertainty where it is even unclear what the key questions are. Lagadec recommends Magellan's attitude in 1519, before setting off on his trip around the world: "*The task is not to make sure that the sea is calm, but to prepare oneself to sail in stormy unknown waters.*"<sup>52</sup>

<sup>48</sup> "The Lex Column; Insurance and Society", *Financial Times*, 11 March 2011, p. 14

<sup>49</sup> CII Thinkpiece 53: Banned Gender Discrimination in Annuities and Its Implications.

<sup>50</sup> "The Lex Column; Insurance and Society", *Financial Times*, 11 March 2011, p. 14.

<sup>51</sup> Talebs experience comes from spending 20 years as a derivatives trader. Taleb is currently Distinguished Professor of Risk Engineering at New York University Polytechnic Institute.

<sup>52</sup> "Das Überraschende erwarten"; Ulrich Schnabel in *Die Zeit*, 14 April 2011, p. 33 ff.

## THE CR+I PROJECT OF THE GENEVA ASSOCIATION: CLIMATE RISK AND INSURANCE, MANAGING EXTREME EVENTS

### **The Climate Risk and Insurance (CR+I), formerly CC+I, Project of The Geneva Association**

Climate change is one of the great challenges that society faces today. For the insurance industry, it creates new risks as well as opportunities. That is why The Geneva Association members at the 2008 General Assembly in Hamilton, Bermuda, decided to launch a new research project—*Climate Change and its Economic Impact on Insurance* (CC+I)—a logical step in the development of the Risk Management Research Programme started by The Geneva Association in 1973.

At the Working Group (WG) meeting of the CC+I Project on 17 November 2010 in London, the WG decided the transition described in the following in order to maintain the momentum of this programme. The overall guidance of the CR+I Initiative remains unchanged in the hands of the two co-chairs, Kunio Ishihara, Chairman of the Board, Tokio Marine & Nichido Fire Insurance Company Tokyo, and Michael Butt, Chairman of Axis Capital Holdings, Bermuda. Unchanged is also the direction by Walter R. Stahel, head of the Risk Management Research Programme of The Geneva Association.

### **The CR+I Project 2011 and onwards**

The initial CC+I Project included global and scientific topics of climate change (CC), which we dealt with in the first chapters of *The Geneva Reports* n° 2. Not all of these topics will be actively pursued, i.e. we will limit our involvement in the IPCC work discussions in the sense of making the Kyoto Statement and the Joint Statement better known and accepted, much in line with the general understanding that The Geneva Association should extend its outreach component, with a focus on adaptation and paying attention to the emerging liability issue.

The first two CC+I Seminars in Bogotá (2009) and São Paulo (2010) have shown that CC in the Southern Hemisphere is primarily perceived as a threat to populations, both as hazards in health and agriculture (food) and as risks, such as increased floods and mudslides. Our future work on adaptation thus needs to understand and take into account regional issues. In order to broaden our understanding of the Southern Hemisphere, we have decided to organise the 3<sup>rd</sup> CR+I Seminar in Singapore. Asia is the region which, in 2010, suffered the highest economic losses of about US\$75 billion from catastrophes, or a third of total economic losses from disasters worldwide.<sup>53</sup>

The redefined CR+I (Climate Risk and Insurance) Project integrates these insights and will focus on adaptation and managing extreme events, including climate risk. The main emphasis will be on how to increase the resilience to extreme events; we therefore have to be sensitive to regional differences. A closer contact with authorities in charge of disaster reduction, such as civil protection and emergency management offices and national CROs—where they exist—will help, as these structures reflect the regional differences in risk perception. In addition, contacts on the international level will continue. The CC+I Working Group (WG) will be dissolved; The Geneva Association is very grateful to the WG members for their contributions to the publications produced and meetings over the last two years.

A new CR+I Working Group will be created by invitation. A provisional list of CR+I WG experts will be proposed to the co-chairs, taking into account the revised objectives of the project, and include chief risk modellers.

Unlike the CC+I project, the CR+I Project will incorporate a new CR Liability Sub-Committee (CR LSC). This liability sub-committee was founded at the end of 2010; it has its own working group, consisting of invited experts, and is chaired by Richard Murray, with Lindene Patton (ZFS) as deputy chair; and is coordinated by Walter R. Stahel.

### **The achievements of the CC+I Project and the CC+I Working Group of The Geneva Association**

In 2008, a special working group, the CC+I Working Group, was established to study the relations between climate change and insurance as well as to coordinate the project development. The Climate Change and Insurance Working Group consisted of 24 experts, both from member companies of The Geneva Association (Allianz SE, AXA Group, AXIS Capital Holdings Ltd., Lloyd's, Munich Re, SCOR,

<sup>53</sup> Swiss Re's *Sigma*, April 2011.

Swiss Re, Tokio Marine & Nichido Fire Insurance Co., Tryg, Zurich Financial Services) and from internationally renowned academic and research institutions. The Working Group was co-chaired by Kunio Ishihara, Chairman, Tokio Marine & Nichido Fire Insurance Company and Michael Butt, Chairman of Axis Capital Holdings.

The main objectives of the CC+I research project were to identify and analyse:

- issues that are of specific relevance to the insurance industry, such as possible future claims developments, new business opportunities and scenario testing;
- external challenges to be addressed at the political, educational and social levels, such as the role of government-specific provisions concerning, e.g. building codes, zoning restrictions, etc.; and,
- the frontier between risks and opportunities from extreme weather events and those from climate change.

The main results of the CC+I Working Group are a number of reports and statements. The most important ones are the following:

**The Kyoto Statement of The Geneva Association—June 2009**

[http://www.genevaassociation.org/Portals/0/Kyoto\\_Statement\\_signed\\_14July09.pdf](http://www.genevaassociation.org/Portals/0/Kyoto_Statement_signed_14July09.pdf)

Perceiving the need for a member-wide initiative on climate change, the CC+I working group drafted a series of common insurance commitments and undertakings on measures to adapt to and mitigate climate change. The statement also calls on governments to harness the industry's particular skills and unique position in society to help adaptation to the impacts of climate change. At the 2009 Geneva Association General Assembly in Kyoto, an unprecedented 56 of the world's leading insurance companies signed The Geneva Association's Kyoto Statement.

**The Geneva Reports No. 2, Risk and Insurance Research: The insurance industry and climate change – Contribution to the global debate—July 2009**

[http://www.genevaassociation.org/PDF/Geneva\\_Reports/Geneva\\_report\[2\].pdf](http://www.genevaassociation.org/PDF/Geneva_Reports/Geneva_report[2].pdf)

This report summarises the state-of-the-art thinking of a majority of the members of The Geneva Association, representing the world insurance industry, on the subject of climate change.

**Climate change as a major risk management challenge: How to engage the global insurance industry, December 2009**

The Report for COP 15 was printed and widely distributed in Copenhagen and during the following 12 months. It has enabled The Geneva Association to reach a new constituency of politicians and policymakers. [http://www.genevaassociation.org/Portals/0/COP15\\_background\\_paper.pdf](http://www.genevaassociation.org/Portals/0/COP15_background_paper.pdf).

**Joint Statement of The Geneva Association, UNEP-FI, MCII and ClimateWise: Risk management and climate change in the developing world, September 2010**

[http://www.genevaassociation.org/PDF/General\\_Information/Developing\\_World\\_Statement.pdf](http://www.genevaassociation.org/PDF/General_Information/Developing_World_Statement.pdf)

On 6 September 2010, The Geneva Association and three other initiatives (ClimateWise, MCII and UNEP-FI) launched a statement that calls on governments worldwide to harness risk management techniques and insurance expertise to help implement climate change adaptation measures in the developing world. In the context of the increasing economic and human costs of climate change in the developing world, the statement seeks to highlight how governments can unlock significant potential to increase the protection and reduce the vulnerability of developing world populations and economies.

**Compendium of International Contacts and Links, November 2010**

This document contains information on special international insurance industry initiatives, intergovernmental organisations (IGOs), NGOs academic centres and research institutions working on climate change issues from the economic or multidisciplinary perspective.

On the research side, 2010 saw an attempt to draw a line between extreme weather and climate change (see the following table), to include coastal management into the analysis, and to analyse the possible impact of potential climate change litigation based on the deep pocket theory (at the liability forum in London, 20 October 2010).

**Table : Hierarchy of CR+I risks and opportunities**

Level of issue	opportunities	risks
Celestial	solar energy, tidal (marine) energy,	asteroids hitting Earth, solar eruptions disrupting IT and telecom services, solar wind disrupting the magnetic field
Global		
Planet Earth	global commons, using geothermal energy, biodiversity	georisks (volcanoes, earthquakes, tsunamis, magma flows),
<b>MITIGATION</b>	<b>Global Climate Change</b>	<b>mitigation measures</b>
	GHG concentrations	<i>partly possible anthropogenic influence, potential CC liability claims</i>
	Rising sea levels	changes in agro yields, geopolitics favouring Russia, changes in health, food and water supply,
	Ocean currents	changes in agro yields, geopolitics in favour of Russia, changes in health, food and water supply,
	Atmospheric currants	flooding of low level land
	Population	changes in the Gulf Stream, El Niño, La Niña, mass climate migrations
<b>ADAPTATION</b>	<b>Regional</b>	<b>adaptation measures</b>
	Extreme weather events	new insurance products
	Hailstorms	higher severity and frequency
	River floods	
	Tornadoes	
	Windstorms	
	<b>Local</b>	<b>adaptation measures</b>
	Extreme weather events	new insurance products
	Avalanches	higher severity and frequency
	Flash floods	
	Mudslides	
	Storm surges	
Micro	GMO crop yields,	microbes, invasive species (termites, tiger mosquito) resulting risks (timber constructions, human health such as dengue fever)

This table will be revisited periodically, prioritising its data at the same time.

One key objective of this table is to separate the events with a potential human influence—where mitigation is therefore one strategy—from events which are extreme weather events or Acts of God, where adaptation is the most promising strategy.

## THE ART OF CROS NETWORKS

“Risk management” is a subject with many different meanings and objectives. In the past, insurers, industrial corporations and banks have tried to clarify some of the issues involved by creating the position of the Chief Risk Officer or CRO. The Geneva Association, jointly with its members, decided to hold annual events to promote the understanding of the role of the CRO. The ART of CROs Network activities have been managed from the beginning until 30 June 2010 by Dr Bruno Porro. The new chairman, from 1 July, is Dr Hans Peter Würmli.

The **ART of CROs Meetings** consist of Annual Round Tables of Chief Risk Officers. These are open to the CROs of member companies of The Geneva Association. Their objective is to enable discussions of topics that CROs are confronted with in their activities.

The **CRO Assemblies** are open to a wider audience of CROs from insurance, banking and industry, as well as from associations. The objective is to disseminate the knowledge gained and issues identified by the CRO Forum and the ART of CROs workshops. All the activities of the ART of CROs networks are discussed at the annual CRO Assemblies and documented on the websites [www.cronetworks.org](http://www.cronetworks.org) and [www.genevaassociation.org](http://www.genevaassociation.org).

The **CRO Forum** is an action-focused network of more than a dozen members of the ART of CROs from major insurance companies with the objective of identifying concrete issues of some urgency and financing research studies to clarify these issues. The results of these studies are made available to wider audiences through the ART of CROs meetings and the CRO Assemblies. All publications are available on [www.croforum.org](http://www.croforum.org).

### THE ART OF CROs Meetings<sup>54</sup>

In 2002, The Geneva Association decided to create, within its Programme on Risk Management, an “**Annual Round-Table of Chief Risk Officers**”. Its objective is to provide the CROs of the member companies of The Geneva Association with a platform to discuss the roles, objectives and tasks of CROs, and to create a network to exchange experiences and discuss specific risk problems. Meetings are held annually, normally in spring. Each event is sponsored by a CRO and his or her company. The events are thus held at changing locations to share the financial burden.

These meetings also offer the researchers of The Geneva Association the opportunity to discuss their research activities with the risk specialists of the member companies, and to identify and prioritise themes and issues of interest to The Geneva Association’s members. The meetings normally start with a dinner and can extend over one or two days.

The aim of the ART of CROs is to enable a strong exchange of ideas between participants. Each session is launched by a short kick-off presentation, followed by an extensive discussion. Attendance is limited to approximately 25 CROs on a first-come-first-served basis. Participation is free of charge, but CROs interested in attending should register in advance. Participants have to pay their own travel costs and hotel accommodation.

The **7<sup>th</sup> ART of CROs** was held on 29-30 June 2009 at PZU, Warsaw, organised jointly by The Geneva Association and PZU. Presentations can be accessed on The Geneva Association’s website at [www.genevaassociation.org](http://www.genevaassociation.org), *Etudes et Dossiers* n° 354.

The **8<sup>th</sup> ART of CROs** was held in Portugal, on 29-30 April 2010, organised jointly by The Geneva Association and Companhia de Seguros Tranquilidade SA, Lisbon. Presentations can be accessed on The Geneva Association’s website at [www.genevaassociation.org](http://www.genevaassociation.org), *Etudes et Dossiers* n° 361.

The **9<sup>th</sup> ART of CROs** will take place in Basel, Switzerland, on 12-13 May 2011, hosted by the Bâloise Group. Hans Peter Würmli, the new ART of CROs Chairman, established a forward looking great programme that will be attended by 25 CROs.

<sup>54</sup> Chief Risk Officers interested in participating are invited to directly contact the facilitator of this programme, Walter R. Stahel, for more information at [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

## THE ANNUAL CRO ASSEMBLIES <sup>55</sup>

These events are open to a larger audience of Chief Risk Officers from insurance, banking, academia and industry as well as insurance associations. Their objectives are to disseminate the knowledge gained, and to discuss the issues identified by the CRO Forum and the ART of CROs workshops with a larger audience of risk management professionals. The CRO Assemblies are organised by The Geneva Association in association with the Swiss Re Centre for Global Dialogue and Munich Re, alternately, to provide a discussion platform for CROs to address current and emerging risks and opportunities with their peers, as well as leading experts from academia, major insurance and reinsurance companies. Participation is by invitation only. Registration is on a first-come-first-served basis.

Furthermore, the assemblies provide a valuable and comprehensive overview of the prevailing risk landscape by analysing the conclusions reached by different CRO think tanks and relevant industry studies. In addition, the annual assemblies offer interesting external perspectives from industry observers and are an excellent opportunity for networking, designed to foster an environment conducive to interaction and dialogue. Input on topics to be addressed and contributions from participants are welcome.

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The **5<sup>th</sup> CRO Assembly** was held on 11-12 November 2009 at the Swiss Re Centre for Global Dialogue in Rueschlikon, Zurich. It was organised jointly by The Geneva Association, Swiss Re and the CRO Forum. The 5<sup>th</sup> Chief Risk Officer Assembly took place at a time dominated by the consequences of the global financial and economic crisis.

Under the title "Navigating the storm—risk management during an economic crisis", the event took an in-depth look at the challenges risk managers face as they guide their ships through these exceptionally turbulent times and equip them to weather future upheavals. How are the seas after the first few weeks of 2010? The storm may have subsided, but the risk landscape we find ourselves in and the issues we will have to face in the future do not present any less of a challenge.

Copies of the conference report can be ordered from Swiss Re, [www.swissre.com](http://www.swissre.com).

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The **6<sup>th</sup> CRO Assembly** was held on 24-25 November 2010 at Munich Re in Munich, organised jointly by The Geneva Association, Munich Re and the CRO Forum. The theme was "The significant problems we face cannot be solved at the same level of thinking we were at when we created them" (Albert Einstein).

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The **7<sup>th</sup> CRO Assembly** will be held on 16-17 November 2011 on the theme of "The Path to Future Growth—focusing on new risk horizons". It is organised jointly by The Geneva Association, Swiss Re and the CRO Forum, and held at the Swiss Re Centre for Global Dialogue in Rueschlikon, Zurich.

CROs interested in attending should contact Christoph Nabholz at the Swiss Re Centre for Global Dialogue, [Christoph\\_Nabholz@swissre.com](mailto:Christoph_Nabholz@swissre.com), or Walter Stahel, [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

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The **8<sup>th</sup> CRO Assembly** will be held in November 2012 at Munich Re in Munich, organised jointly by The Geneva Association, Munich Re and the CRO Forum. The theme will be announced later.

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**The Position Papers of 19 CROs of the world's leading insurance and reinsurance companies are published as follows:**

- The papers on the CRO Forum's ER (Emerging Risk) Initiative can be found under <http://www.croforum.org/>
- Climate Change & Tropical Cyclones in the North Atlantic, Caribbean and Gulf of Mexico <http://www.cronetworks.org/Cro%20Products/CRObriefing.pdf>

<sup>55</sup> Chief Risk Officers interested in participating are invited to contact directly the facilitator of this programme, Walter R. Stahel, for more information ([walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org)).

## BOOKS, PUBLICATIONS, ARTICLES AND PAPERS RECEIVED

### **Resilience Engineering in Practice—A Guidebook**

the following information was kindly supplied by the editors.

Edited by Erik Hollnagel, MINES ParisTech, France, Jean Pariès, Dédale SA, France, David Woods, Ohio State University, U.S. and John Wreathall, John Wreathall & Co., U.S.

Ashgate, December 2010, 362 pages, ISBN: 978-1-4094-1035-5, Series: Ashgate Studies in Resilience Engineering; This title is also available as an e-book, ISBN 978-1-4094-1036-2

Resilience engineering (RE) has since 2004 attracted widespread interest from industry as well as academia. Practitioners from various fields, such as aviation and air traffic management, patient safety, off-shore exploration and production, have realised its potential and became early adopters.

The continued development of RE has focused on four abilities that are essential for resilience. These are the ability a) to respond to what happens, b) to monitor critical developments, c) to anticipate future threats and opportunities, and d) to learn from past experience—successes as well as failures. Working with the four abilities provides a structured way of analysing problems and issues.

This book is divided into four main sections which describe issues relating to each of the four abilities. The chapters in each section emphasise practical ways of engineering resilience and feature case studies and real applications. The text is written to be easily accessible for readers.

Prologue: **The scope of resilience engineering**, Erik Hollnagel;

Part I **Dealing with the Actual**: Resilience and the ability to respond, Jean Pariès; Lessons from the Hudson, Jean Pariès; Coping with uncertainty. Resilient decisions in anaesthesia, Lucie Cuvelier and Pierre Falzon; Training organisational resilience in escalating situations, Johan Bergström, Nicklas Dahlström, Sidney Dekker and Kurt Petersen.

Part II **Dealing with the Critical**: Monitoring—a critical ability in resilience engineering, John Wreathall; From flight time limitations to fatigue risk management systems—a way toward resilience, P. Cabon, S. Deharvengt, I. Berechet, J.Y. Grau, N. Maille and R. Mollard; practices for noticing and dealing with the critical; a case study from maintenance of power plants, Elizabeth Lay; Cognitive strategies in emergency and abnormal situations training—implications for resilience in air traffic control, Stathis Malakis and Tom Kontogiannis.

Part III **Dealing with the Potential**: Resilience and the ability to anticipate, David D. Woods; Basic patterns in how adaptive systems fail, David D. Woods and Matthieu Branlat; Measuring resilience in the planning of rail engineering work, P. Ferreira, J. R. Wilson, B. Ryan and S. Sharples; The art of balance: using upward resilience traits to deal with conflicting goals, Berit Tjørhom and Karina Aase; The importance of functional interdependencies in financial services systems, Gunilla A. Sundström and Erik Hollnagel.

Part IV **Dealing with the Factual**: To learn or not to learn, that is the question, Erik Hollnagel; No facts, no glory, John Stoop; From myopic coordination to resilience in socio-technical systems. A case study in a hospital, Anne Sophie Nyssen; Requisites for successful incident reporting in resilient organisations, Alberto Pasquini, Simone Pozzi, Luca Save and Mark-Alexander Sujan; Is the aviation industry ready for resilience? Mapping human factors assumptions across the aviation sector, Kyla Zimmermann, Jean Pariès, René Amalberti and Daniel H. Hummerdal; Epilogue: RAG—the resilience analysis grid, Erik Hollnagel; Bibliography; Indexes.

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**Future Global Shocks: Can we cope with the challenges?** A forthcoming report by OECD, the Organisation for Economic Co-Operation and Development, Paris, [www.oecd.org/futures](http://www.oecd.org/futures).

The OECD report is expected to be published by June 2011. It will be available on the e-bookstore of the Organisation. Subsequently a number of presentations will be made in capitals and international fora. The five case studies will also be published in paper versions thereafter.

A summary of this forthcoming report can be found on p. 17 of this newsletter.

## SUMMARY OF THE RISK MANAGEMENT PROGRAMME OF THE GENEVA ASSOCIATION

Consult also the websites: [www.cronetworks.org](http://www.cronetworks.org) and  
[http://www.genevaassociation.org/Research\\_Programme/Risk\\_Management.aspx](http://www.genevaassociation.org/Research_Programme/Risk_Management.aspx)

### M.O.R.E.—Management of Risks in the Economy

The M.O.R.E. Seminars are an integral part of The Geneva Association's Risk Management Programme and a key tool in the dialogue with other economic actors in order to emphasise the role of insurance in a modern service economy. They are completed by the Climate Risk and Insurance (CR+I) seminars, held annually on topics related to climate change.

**THE M.O.R.E.—Seminars** of the last years:

- 23 **Insurance Industry and climate change—a contribution to the global debate**, with a special focus on South America, was organised in Bogotá, jointly with Suramericana de Seguros SA, 19-20 October 2009. Papers were published in *Etudes & Dossiers* n° 356, January 2010.
- 24 **Modelling and Mapping Risks**, has been held 23-24 June 2010 at Bermuda, hosted by Axis Re. Papers were published in *Etudes & Dossiers* n° 364, October 2010.
- 25 **Modelling and Mapping Risks and Opportunities**, to be held 12-13 July 2011 at Bermuda, hosted by Axis Re. A Call for Papers can be found on p. 7 of this newsletter.

**THE M.O.R.E. Studies** of recent years:

“INTEREST—Insurance, Technological Risks and Emerging Science and Technology Policies—Final Report to the European Commission”. *Etudes & Dossiers* n° 267, March 2003

“Vulnerabilities and Criticalities of Technical and Organisational Systems in the New Service Economy”, by Andrew Koubatis and Jorge Yerena Schönberger, published in *Etudes & Dossiers* n° 280, Special Report, March 2004.

### The Climate Risk and Insurance (CR+I) Project

The Climate Risk and Insurance (CR+I) Project, formerly Climate Change and Insurance (CC+I) is the second pillar of the Risk Management research programme of The Geneva Association. It consists of:

- the CR+I working group, of invited experts,
- the CR+I reports; and,
- the CR+I seminars:

The 1<sup>st</sup> CC+I—Seminar, organised jointly with Suramericana de Seguros, was held in Bogotá, Columbia, 19-20 October 2009.

The 2<sup>nd</sup> CC+I—Seminar, organised jointly with Allianz do Brasil, was held in São Paulo, Brazil, 27-28 September 2010.

The 3<sup>rd</sup> CC+I Seminar will be held 18-19 October 2011 in Singapore. A Call for Papers can be found on p. 10 of this newsletter. Experts wishing to attend or should contact Walter Stahel at [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

#### **The Risk Management Newsletter**

This newsletter is published biannually by The Geneva Association and is available on our website at [www.genevaassociation.org](http://www.genevaassociation.org). Subscription is free for all interested parties.  
 Editor's e-mail: [walter\\_stahel@genevaassociation.org](mailto:walter_stahel@genevaassociation.org).

The *Risk Management Newsletter* is an integral part of The Geneva Association's dialogue with other economic actors in order to emphasise the role of insurance in a modern service economy. Other research programmes deal with Insurance and Finance, PROGRES (research programme on Regulation, Supervision and Legal Issues), Insurance Economics, World Fire Statistics, The Four Pillars (research on social security, insurance and retirement), Health and Ageing (research on health and productive ageing) and the general programme on the activities, news, and subjects of special interest concerning The Geneva Association.



**International Association  
for the Study of Insurance Economics**  
"The Geneva Association"

53, Route de Malagnou  
CH-1208 Geneva  
<http://www.genevaassociation.org>

Tel. +41-22-707 66 00  
Fax +41-22-736 75 36  
E-mail: [secretariat@genevaassociation.org](mailto:secretariat@genevaassociation.org)

**SCHEDULE OF CONFERENCES ORGANISED AND/OR SPONSORED BY  
THE GENEVA ASSOCIATION**

**2011**

**May**

- |       |                |   |
|-------|----------------|---|
| 12-13 | Basel          | <b>9<sup>th</sup> ART of CROs</b> , hosted by Bâloise-Holding                             |
| 25-28 | Rio de Janeiro | <b>38<sup>th</sup> General Assembly of The Geneva Association</b> ( <i>members only</i> ) |

**June**

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|-------|---------|---|
| 17    | Beijing | <b>7.5 Liability Regimes Conference</b> , hosted by Swiss Re  |
| 19-22 | Toronto | <b>The Geneva Association/IIS Research Award Partnership</b>  |
| 28    | Madrid  | <b>8<sup>th</sup> Geneva Association Associates Meeting</b> , hosted by MAPFRE ( <i>Associates only</i> ) |

**July**

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|-------|---------|--|
| 12-13 | Bermuda | <b>M.O.R.E. 25 on Mapping and Modelling Risks and Opportunities (MMR+O 2)</b> , hosted by Axis Re at the Bermuda Underwater Exploration Institute (BUEI), Bermuda. Open to all experts |
|-------|---------|--|

**September**

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|-------|--------|---|
| 19-21 | Vienna | <b>38<sup>th</sup> Seminar of the European Group of Risk and Insurance Economists (EGRIE)</b> |
|-------|--------|---|

**October**

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|-------|-----------|---|
| 18-19 | Singapore | <b>3<sup>rd</sup> CR+I Seminar on "Interactions between Private Sector and Asian Policy-makers on Mitigation and Adaptation for Extreme Events and Climat Risks"</b> , hosted by the Institute of Catastrophe Risk Management (ICRM) of NTU, organised in collaboration with the Disaster Risk Financing and Insurance (GFDRR) Programme of the World Bank and the National Climate Change Secretariat of the Singapore Prime Minister, by The Geneva Association |
| 27-28 | Munich    | <b>8<sup>th</sup> Annual Liability Regimes Conference</b> , hosted by Munich Re   |

**November**

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|-------|------------|--|
| 14-15 | Toronto    | <b>8<sup>th</sup> Health and Ageing Conference</b> of The Geneva Association on "Insurance and Dementia Diseases, hosted by Sun Life Financial     |
| 16-17 | Rüschlikon | <b>7<sup>th</sup> CRO Assembly</b> on "The Path to Future Growth—Focusing on New Risk Horizons", jointly organised with Swiss Re and the CRO Forum |

**December**

- |     |        |   |
|-----|--------|---|
| 7-8 | London | <b>8<sup>th</sup> International Insurance and Finance Seminar of The Geneva Association</b> , hosted by Aviva |
|-----|--------|---|