

Global Risk Dialogue

Allianz Global Corporate & Specialty
Issue 1: 2015



SPECIAL TOPIC

Aviation 100

Global Risk Dialogue examines some of the significant developments that have shaped 100 years of aviation insurance and looks at the risk challenges to come...

04
Urbanization

What's the world's most sustainable city?

08
That's Entertainment

How the industry is changing and the risks involved

10
"Smart ships"

Why big data will influence the future at sea

Allianz 

PUBLISHER

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Contents



Photo: Shutterstock

Destroyed by fire during landing in 1937, the Hindenburg, which was insured by Allianz, is regarded as one of the world's first serious air accidents.

SPECIAL TOPIC
Aviation 100



Photo: Wikimedia Commons

Solar-powered planes are one of the more recent aviation design innovations.

- 18 A Milestone in aviation...**
Global Risk Dialogue commemorates 100 years of aviation insurance
- 22 Safer skies**
Despite recent tragic loss activity, the aviation industry has improved its safety record
- 28 The risks of the future**
Innovation, climate change and managing growth top the challenges ahead

IN BRIEF

- 04 Global risks at a glance**
- 05 News**
- 06 Record year for car recalls**
- 07 Loss log: Shipping losses**
- 08 4 Questions for...**
Lauren Bailey, Global Head of Entertainment, AGCS

REGIONAL EYE

- 09 Americas: Cyber is top risk**
Cyber risk is the biggest mover in the region's top 10 business risks

RISK FUTURES

- 10** **“Smart ships” – tomorrow’s talking hulls**
Technology, and smart use of big data in particular, will drive the next generation of ships
- 14** **“Mega ships” make waves**
More larger vessels at sea increases the likelihood of a \$1bn+ industry loss



Advances in ship construction will transform the maritime industry in future, resulting in innovations such as data-centric engineering and even unmanned ships.



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EDITORIAL



In 1915 the underwriting of an airship insurance policy began what is now a 100-year-old relationship between Allianz and the flight industry.

This issue of **Global Risk Dialogue** examines some of the significant developments that have shaped this partnership – from supporting the daring exploits of the early aviators to aiding 21 space launches last year alone.

As well as looking back, we also look to the future – identifying not only the risks that are likely to challenge the aviation industry in years to come, but also those which will impact the maritime world. The recent introduction of the largest container ships ever built demonstrates the remarkable innovation of this industry but also raises questions about whether risk management needs rethinking, as vessels increase in size.

Meanwhile, introduction of so-called “smart ships” could enhance productivity and safety in future. However, as well as presenting opportunities, such new technologies often entail risk challenges of a different nature... Enjoy the issue.

Chris Fischer Hirs
CEO
Allianz Global Corporate & Specialty

IN CONCLUSION

- 30** **Addressing the talent gap**
Retirement of “baby boomers” will leave skills gaps. What can be done
- 31** **AGCS content showcase**
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Photo: Rolis Royce plc/Ship Intelligence; Flickr

Global risks at a glance

Disaster losses fall as events rise



Photo: Shutterstock

Losses from Ela cost \$2.2bn.

Insured losses from disasters were below average in 2014, despite a record number of natural catastrophe events, according to analysis from Swiss Re.

The reinsurer's latest **Sigma** study says global insured losses from natural catastrophes and "man-made" disasters cost **\$35bn** last year, down from \$44bn in 2013 and well below the \$64bn average of the previous 10 years.

There were **189** natural catastrophe events – the highest ever on record – resulting in global economic losses of \$110bn. Of the \$35bn in global insured losses, \$28bn was attributed to natural catastrophe events.

In May, a spate of severe storms with hail in the US resulted in the largest insured loss event of 2014, with insurance claims of **\$2.9bn**.

In Europe in the following month, the low pressure system **Ela** brought large and damaging hail to parts of France and Belgium, and strong winds in Germany. Combined insured losses were **\$2.2bn**. **View the full report at www.swissre.com**

The world's most sustainable city

Frankfurt has been ranked top of 50 global cities examined for their sustainability in an index compiled by Dutch design group Arcadis.

European cities dominated the rankings with London, Copenhagen, Amsterdam and Rotterdam completing the top five.



Photo: Shutterstock

Frankfurt came top out of 50 cities.

No North American city made it into the top 10. Toronto is the highest ranked at 12th, while Boston (15th) and Chicago (19th) are seen as the most sustainable US cities. Asian cities Seoul, Hong King and Singapore all made the top 10.

In a rapidly urbanizing world, the way in which cities are planned, built, operated and redefined has a huge social, environmental and economic impact. City leaders need to find ways to balance the demands of generating strong financial returns, being an attractive place for people to live and work in, whilst also limiting their damage to the environment, Arcadis said.

The index explores these three demands of people, planet and profit to develop its rankings. **View the index at www.sustainablecitiesindex.com**

Allianz Risk Barometer released

Business interruption (BI) and supply chain, natural catastrophes and fire/explosion are the major risks which occupy the attention of companies in 2015, according to the fourth annual **Allianz Risk Barometer**, which surveys over **500** risk managers and corporate insurance experts from more than 40 countries.

However, businesses are increasingly concerned about a number of emerging perils from today's complex global business environment. **Cyber risk** is the most significant mover in this year's Risk Barometer and is also the top emerging risk for the next five years.

Meanwhile, developing global networks means many companies are increasingly exposed to the prospect of **political/social unrest/war**, which is another significant mover in this year's Risk Barometer. The disruptive impact of such instability – in addition to any direct damage caused – is also one of the major risks for which companies are least prepared. **View the full report at www.agcs.allianz.com/insights**

News from AGCS and Allianz

www.agcs.allianz.com

AGCS FFIC North America integration



AGCS has announced the close of the sale of the **Fireman's Fund Insurance Company (FFIC)** personal lines insurance business in the US to ACE Ltd. The close of the sale represents one of several milestones Allianz achieved during the first quarter of 2015 as it restructures its North America business through the integration of the FFIC commercial business into AGCS.

This integration has roughly doubled the size of AGCS in North America to around \$3bn in gross written premiums and will expand AGCS's product range, both within the US market and internationally.

In addition to launching a new financial lines range of products (*see right*) to complement the established professional liability teams coming to AGCS as part of the Fireman's Fund commercial integration, the FFIC commercial portfolio also includes a strong range of products for small and mid-size businesses, covering **farm & ranch, mid corporate property and casualty, small businesses, programs, and crop**, as well as its market-leading **entertainment** business. AGCS will market these under the Allianz brand alongside its existing offering of large corporate and specialty products, including property, casualty, construction, international insurance programs, energy, aviation and marine, using the combined FFIC/AGCS distribution network across North America.

For more on entertainment see page 8.

Crisis management expertise



The uptick in geopolitical tension presents new risks.

AGCS has appointed Christof Bentele as Head of Crisis Management, a key growth area for its global liability team. AGCS aims to further develop and combine existing and new products in the areas of **product recall and contamination, terrorism and political violence**.

Bentele reports to Michael Hohmann, Global Head of Liability, AGCS.

"This is the first time AGCS has recruited an expert solely focused on this area," Hohmann said. "The changing geopolitical situation creates new risks and threats for our clients affecting their businesses, their assets and people. Whether that is the ever-expanding supply chain or the growing threat of terrorism or political violence they all have one thing in common: Our clients have to deal with issues outside their comfort zone."

For more on product recall **see page 6**.

AGCS launches financial lines in US

AGCS is launching a range of financial lines insurance products in the US, with former Zurich US executive Paul Schiavone appointed to the new role of Regional Head of Financial Lines, North America.

Insurance coverage available includes directors' and officers' (**D&O**), professional indemnity (**PI**), and errors and omissions (**E&O**) to complement the established **professional liability** teams coming to AGCS as part of the Fireman's Fund commercial integration (*see main story*). Schiavone will be based in New York.



Record year for car recalls

Automotive recall cases are becoming more frequent with last year setting a new record for incidents in the US. Shorter development cycles, faster production, global suppliers and more technical complexity are among the reasons why.

Almost **64 million cars** were sent back to repair shops as a result of safety issues in the US in 2014 – more than twice as many as in 2004, the year which previously counted the highest number of recalls, according to official government data.

Almost half of these safety issues were related to passenger protection systems, followed by problems with electronic components and brake defects.

Meanwhile, in **Germany**, the number of recalls also sharply increased - **1.9 million cars** were recalled in 2014 according to data from the Center of Automotive Management at the University of Applied Sciences in Bergisch-Gladbach, almost twice as many as in the previous year (**1.1 million**). Most of the problems in Germany were again linked to passenger protection systems. Defective airbags were responsible for a large number of recalls, having been delivered to multiple manufacturers by the same supplier.

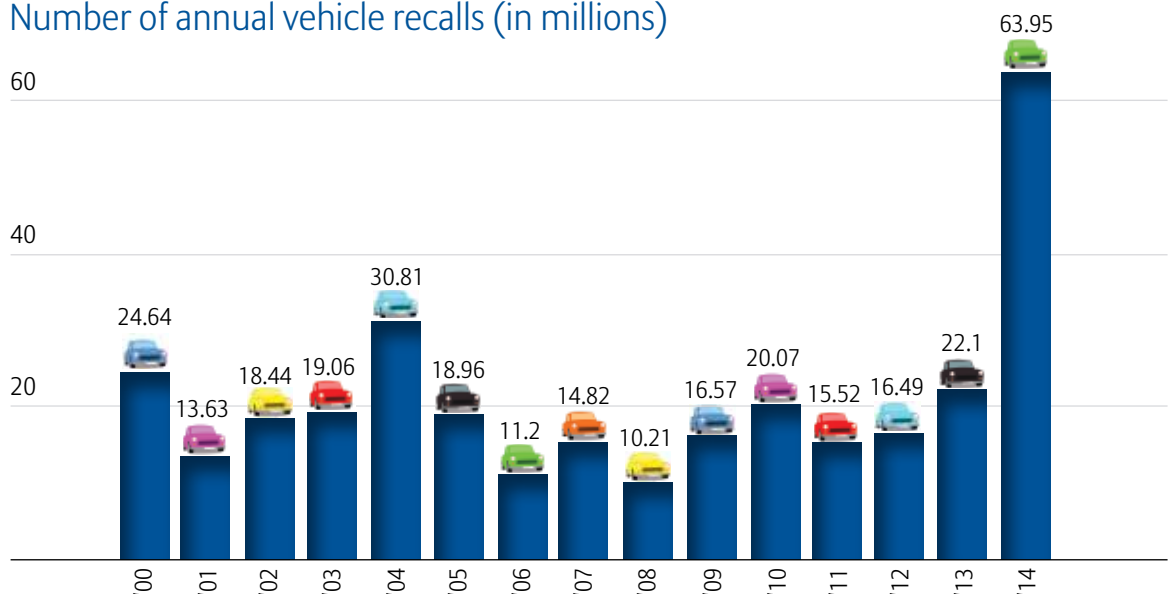
There are many reasons behind the rise in recalls. The automobile industry is extremely competitive and car manufacturers are reacting to this by shortening

development cycles even further, cutting production times and producing vehicles on an increasingly global scale, with more and more suppliers. At the same time, technical complexity is increasing and the risk of errors is growing. Almost **one in two recalls** today is related to **electronic components**.

Another reason is that the same components are built into various vehicle types in parallel, which was the case with the airbags in 2014, for example. And recalls are also a sign that safety has increased: manufacturers now admit errors rather than hide them.

Depending on the market, insurers are confronted with varying regulations regarding vehicle recalls. "Automobile recalls occur more frequently in the US than in Germany because the American legal regulations are more stringent than in Germany," explains Carsten Kriegelstein, Head of Liability at AGCS in Germany. Meanwhile, in the US, breaching a technical norm, such as excessively high emission values of a fuel injection system, is already a reason to recall a vehicle. In Germany, a manufacturer is only obliged to issue a recall if there is a real risk of bodily injury resulting from a technical defect of the car.

Number of annual vehicle recalls (in millions)



Source: National Highway Traffic Safety Administration

Loss Log

Shipping losses continued their downward trend in 2014 with the total number for the year the lowest for a decade.



Source: Safety & Shipping Review 2015, Allianz Global Corporate & Specialty

There were **75 losses** between January 1 and December 31 last year, according to the third annual **AGCS Safety and Shipping Review 2015**, which analyzes reported shipping losses of over 100 gross tons.

This compares favorably with 2013 when there were 110 reported losses, meaning that total losses are **down by 32%** year-on-year. The 2014 accident year also represents a significant improvement on the 10-year loss average (2005-2014 period) which totals 127. (2014 total losses down on 10-year average by **41%**). In total shipping losses have declined by almost 50% around the world since 2005 when they totaled 149 (*see table above*).

More than a third of 2014's total losses were concentrated in two maritime regions. As in 2013, South China, Indo China, Indonesia and the Philippines was the maritime region with the most losses (**17**),

closely followed by Japan, Korea and North China (**12**). No other maritime region had double-digit losses for the year.

The most common cause of losses over the past year was **foundering** (sinking or submerging) (**49**), accounting for **65%** of all losses. Wrecked/stranded (**13**) was the second top cause of loss. Meanwhile, there was a significant reduction in the number of fire/explosion incidents resulting in total losses. There were just **4** during 2014, down **73%** year-on-year.

A third of the vessels that were losses were **cargo ships (25)** with fishery (**14**) the only other type of vessel to record double-digit losses. Together, these two types of vessels accounted for over 50% of all losses.

To view **Safety and Shipping Review 2015** visit www.agcs.allianz.com/insights

4 Questions for...

Lauren Bailey

Global Head of Entertainment, Allianz Global Corporate & Specialty

With an illustrious history dating back over 100 years to Hollywood's silent film era, entertainment insurance has a vital role to play in ensuring the show goes on, as Lauren Bailey explains.



Entertainment insurance is a new global business line for AGCS in 2015 but its origins date back much further....

We have been insuring films since the silent era in the 1890s (*through the Fireman's Fund Insurance Company, whose commercial insurance unit is now integrated with AGCS*). From the earliest motion pictures featuring The Keystone Cops and Charlie Chaplin, through all 24 James Bond productions, to a host of Best Picture Oscar winners, over the years we have protected thousands of films for the industry's top studios. However, the entertainment insurance portfolio also covers a broad portfolio of projects in addition to Hollywood blockbusters, such as independent films, documentaries, network television programs and commercials, music tours, festivals and other live events.

What kind of risks does entertainment insurance cover?

Entertainment insurance typically covers property and casualty risks to productions and live events. It can include physical risks for cast, crew, wardrobe, sets and equipment. General liability also represents a key entertainment cover, for example at events where an organizer will need cover for injuries to performers and audience members. We also offer coverage for extra expenses associated with a production delay.

Risk prevention is another important feature of what we do. We have dedicated entertainment risk consultants who are able to offer safety guidance, knowledge and insights to help protect cast members, performers, sets and audience members alike.

We also play a significant role in supporting industry groups promoting safety, such as

the Event Safety Alliance in North America for example, which is dedicated to improving safety through all phases of event production.

How is the entertainment industry changing?

Today, the entertainment business constitutes a huge global marketplace. Markets such as the US, Canada and the UK are still extremely important but movies and television programs are now filmed in many different locations around the world. Similarly, in the 'live' sector more and more artists are going on tour to locations around the world. Technological advances mean people are really pushing the envelope in terms of visual effects, stunts and locations; both in filming and on stage at a live event. For example, many concerts are now huge productions, incorporating elaborate elements previously only seen in the movies. Such changes mean risk consulting, underwriting and claims expertise have become a much more important component of the entertainment business. And with the industry rapidly expanding into new markets, including emerging economies, this creates opportunities for insurers which can operate on a global level.

What is the most satisfying part of your job?

The challenge. Every day is different. Every risk is different. We never really know what we are going to be faced with when we come in to work. It is pretty much a 24/7 business because we are supporting a fast-paced global industry. Many of the productions that we work on are quite fluid. Things change and can do so very quickly; it could be the impact of the weather or something to do with an artist or cast member. It is just such an exciting business and we need to expect the unexpected. I'm fortunate to work with the best people in the business and I feel like I learn something new every day.

LAUREN BAILEY

As of January 1, 2015, Lauren Bailey is Senior Vice President and Global Head of Entertainment for Allianz Global Corporate and Specialty. Previous to the integration of Fireman's Fund and AGCS, she was the head of Fireman's Fund's Entertainment Division, long considered to be the leading insurer of Hollywood. Lauren and her team provide expert and creative solutions for a wide variety of risks, from major motion pictures and music festivals to individual entertainers and artists, as well as the businesses that support this dynamic industry. Her responsibility now extends worldwide as she and her leaders, located in Burbank, California, begin the exciting work of expanding the Entertainment footprint to new markets, working with AGCS leaders in other regions and bringing new products.

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Cyber risks and talent gap rising concerns...

Traditional industrial concerns may continue to worry businesses across the Americas region the most, but companies are also increasingly aware of new challenges posed by today's fast-paced, interconnected corporate environment, according to a new study.

Top 10 business risks by region in 2015: Americas



Top 10 business risks		2014 Rank	Trend
1	Business interruption and supply chain	56% (1)	-
2	Natural catastrophes	53% (2)	-
3	Fire/explosion	26% (3)	-
4	Cyber crime, IT failures, espionage, data breaches	11% (8)	▲
5	Changes in legislation and regulation	15% (5)	-
6	Loss of reputation or brand value	16% (4)	▼
7	Talent shortage/aging workforce	9% (9)	▲
8	Intensified competition	9% (10)	▲
9	Commodity price increases	NEW	▲
10	Quality deficiencies, serial defects	NEW	▲

Source: Allianz Risk Barometer 2015, Allianz Global Corporate & Specialty. Figures represent a percentage of all relevant responses. Responses: 139. More than one risk selected.

DID YOU KNOW?

Theft and manipulation of data is the scenario companies fear most from a cyber-attack, according to 64% of responses to the Allianz Risk Barometer

Business interruption (BI) and supply chain risk, natural catastrophes and fire/explosion are the top concerns that continue to occupy the attention of businesses across the Americas region in 2015.

However, companies are also increasingly aware of the growing threat posed by a number of emerging perils such as cyber risks and a shortage in skilled talent, according to the fourth

for businesses after BI and supply chain and natural catastrophes in the **US**.

Meanwhile, a combination of shortage of skilled talent, together with an aging workforce is deemed an increasing concern and a new entry in the top 10 risks in the US, ensuring it also rises year-on-year in the regional rankings, up to 7th top risk from 9th.

Concerns over quality deficiencies and serial defects and commodity price increases are also higher year-on-year across the Americas, compared with 2014, replacing worries over theft, fraud and corruption and market stagnation and decline in the top 10. However businesses in the region are still concerned about intensified competition across the board with this issue judged to be more of a concern than it was 12 months ago.

annual **Allianz Risk Barometer**, which quizzes both risk managers and corporate insurance experts in the aviation; engineering and construction; financial services; food and beverage; manufacturing; marine and shipping; oil and gas; power and utilities and transportation sectors.

Across the Americas region cyber risks, including cyber crime, IT failures, espionage and data breaches, is the big mover in this year's top 10 business risk rankings rising from 8th position a year ago to 4th position in 2015, with it now being ranked as the third top risk

Figures represent a percentage of all relevant responses for USA (106). Responses for Americas (139). More than one risk selected.

The most important risks for businesses in the USA

Top 10 business risks for the USA		2014 Rank	Trend
1	Business interruption and supply chain	1 (113)	-
2	Natural catastrophes	2 (58)	-
3	Cyber crime, IT failures, espionage, data breaches	5 (15)	▲
4	Fire/explosion	3 (24)	▼
5	Changes in legislation and regulation	8 (10)	▲
6	Loss of reputation or brand value (e.g. from social media)	4 (17)	▼
7	Talent shortage, aging workforce	NEW	▲
8	Commodity price increases	NEW	▲
9	Intensified competition	6 (12)	▼
10	Quality deficiencies and serial defects	7 (16)	▼

Source: Allianz Risk Barometer 2015, Allianz Global Corporate & Specialty

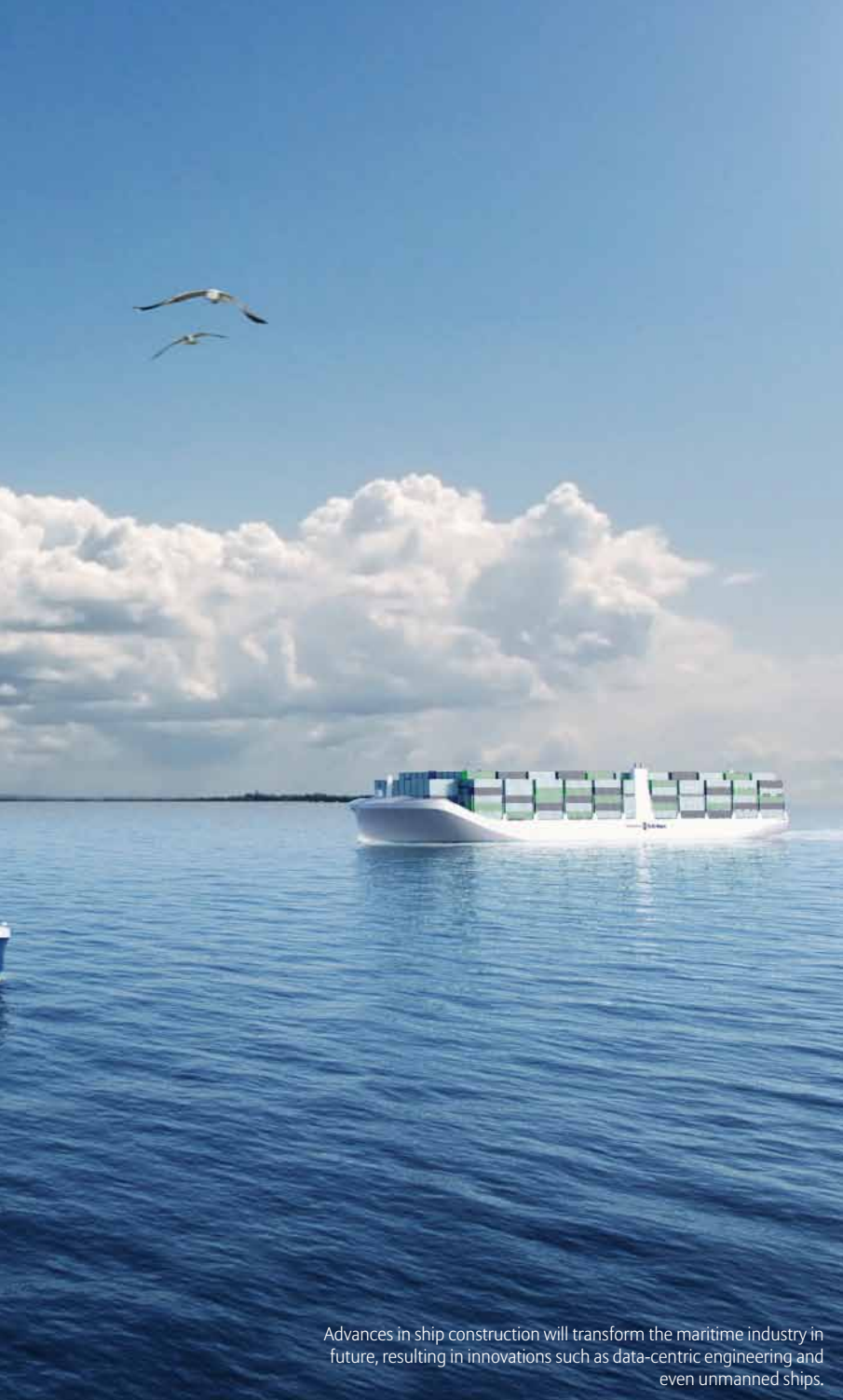
“Smart ships” heading for port



Photo: Rolls Royce plc Ship Intelligence; Flickr

A world where ships can “talk”. It may sound like a tagline for a science fiction movie but it’s not as far-fetched as it sounds – such ships could be coming to a sea near you within 10 years. However, this timeline is dependent on whether the industry can find a way to process the mass of data accompanying their arrival...

CARLY FIELDS



Advances in ship construction will transform the maritime industry in future, resulting in innovations such as data-centric engineering and even unmanned ships.

Imagine a world where the inanimate objects of the shipping industry could talk. What would today's ships tell us about the stress overweight containers place on their hulls? How would they describe the strain they are put under by certain weather conditions? And how would they express the real impact of slow steaming on their superstructure? It sounds the stuff of science fiction, but **"talking" ships** could be just a few years away.

These **"smart ships"** of the not-so-distant future will be able to "talk" through the use of nanotechnology in paints, coatings and materials, while ultra-sensitive monitoring through the use of acoustic fibers will allow the detection of minute changes in vibrations.

In this brave, new maritime world voyage data and data from ship structures, components and machinery will be collated and used to enhance performance, productivity and, crucially, safety. There will also be commercial benefits – key if the innovation is to stick – where, for example, instead of avoiding bad weather, ship operators can optimize routes that are tailored to the capability of the ship.

This will then lead to a natural move away from fixed maintenance intervals, towards tailored predictive maintenance, which will reduce operator risk and provide improved cost efficiency. Analytics will also support maintenance planning and optimization, as well as operational planning and deployment. Generally, ships today factor in maintenance at a time that is convenient to the commercial plan, but in the future routes might be adapted dynamically to fit with the operational and mechanical plan.

The impact of big data

Jarek Klimczak, Master Mariner and Senior Marine Risk Consultant, AGCS, explains that some early adopters are already on board with the benefits of hull monitoring.

"I used to sail on a vessel which had acceleration gauges. These monitored acceleration and measured how the hull behaved under certain conditions. This system allowed constant monitoring of the vessel and made a prognosis based on the weather forecast, parameters of the vessel and the readings."

But super smart ships throw up a fundamental problem: what to do with the large amount of data they will inevitably generate. Ultimately, it will be the success or otherwise of handling this industry-specific big data that will dictate the level of ship efficiency gains.

Captain Andrew Kinsey, Senior Marine Risk Consultant, Allianz Risk Consulting, AGCS, believes that looking at ships at this organic level needs careful thought. "You can get so much data at this nano-level – how do you adequately collate, read and analyze it?" Once these questions have been answered, you can do big things with this big data.

Feedback over the life of the vessel on what it is actually doing, rather than relying on theory, is a solution to understanding what has happened with marine losses, such as the MOL Comfort (*see page 13*), says Kinsey. "When you can get actual reports on what the vessel was encountering that will revolutionize construction. It's fascinating and it's not going to go away," he says.

The rise of data-centric engineering

In fact, future ship intelligence goes beyond nanotech and ultra-monitoring. Rolls-Royce believes that within

“Ship intelligence is going to be the driving force that will determine the future of the industry, the type of ships at sea, and the competence levels required from tomorrow’s seafarers”

10 years, ships’ bridges will be solely focused on processing high level data analysis to operate on-board systems to manage propulsion and navigation.

DID YOU KNOW?

Smart ships will use voyage data and data from ship structures, components and machinery to enhance performance

Its Future Operator Experience Concept or ‘oX’, developed with Finland’s VTT Technical Research Centre, sees a future with smart crew workstations, which automatically recognize individuals when they walk into the bridge, and adjust to their own preferences. The windows of the oX bridge will be augmented reality displays of the vessel’s surroundings, including visualizations of potential

hazards that would otherwise be invisible to the human eye.

Rolls-Royce President, Marine, Mikael Makinen describes this as a “truly exciting period in the history of shipping”. He says: “Technology, and in particular, the smart use of big data is going to drive the next generation of ships. Over the next 10 to 20 years we believe ship intelligence is going to be the driving force that will determine the future of our industry, the type of ships at sea, and the competence levels required from tomorrow’s seafarers.”

Classification societies have already started to review their services in light of the arrival of what they describe as “data-centric engineering”. Lloyd’s Register Foundation, the UK charity dedicated to research and education in science and engineering, published its **Foresight Review of Big Data** in December, explaining that data-centric engineering places a value on data as an asset in itself, and puts data considerations at the core of engineering design. This, it believes, will improve “performance, safety, reliability and efficiency of assets, infrastructures and complex machines”.

Changing role of classification societies

Dr Sven Gerhard, Global Product Leader Hull & Marine Liabilities, AGCS, agrees that classification societies have certainly discovered the value of big data, “but they do not yet know how they are going to use it. They know they have to develop new services and new products. We will see changes with classification

societies in the services they offer and the way in which they undertake their regular surveys, based on the additional data that will be available to them.”

Lloyd’s Register (LR) chief executive Richard Sadler is a strong advocate of a maritime world where data from ship structures, components and machinery is centrally collected and used to enhance maintenance programs.

“My vision for this is that all the design data collected by major shipbuilders around the world from these

“Smart ships” – tomorrow’s “talking” hulls

Advances in ship construction and in materials for ship building, could lead to “talking” ship hulls, potentially enabling real-time data to be sent to a centralized control center to take the guess work out of stress monitoring in future.

This micro-level monitoring will remove many of the unknowns in shipping casualties, as detailed data will provide the information needed to quickly ascertain why a structural failure occurred.

With costs for nanomaterials and ultra-sensitive gauges coming down, classification societies have already turned their focus on to the future of ship construction and how to best handle the big data that ships of the future will be able to generate.

Jarek Klimczak, Master Mariner and Senior Marine Risk Consultant, AGCS believes the industry could start benefitting from this “smart” technology within one to two years but cost will be a hurdle to widespread take-up. There is also the question of what to do with the amount of data that will be generated and how classification societies will alter their surveying services based on this level of detail.

technologies would be held in a control center that could be run by them, or perhaps even by LR. Instead of using prescriptive regulation for maintenance on a time-based system, we would use this data to run the machinery until it shows signs of requiring maintenance.”



For more information visit <http://www.agcs.allianz.com/insights/white-papers-and-case-studies/shipping-review-2015/>

But this evolution comes at a price, and a hefty one at that, if you start down the road of a centralized control center to process big data, as Sadler envisions.

“For the shipping industry cost might be a big barrier especially with the present condition of the market,” agrees Klimczak, while Gerhard believes it is a question of cost efficiency and what companies actually want to achieve with their big data.

And even if the money can be found, the change in mind-set needed to drive smart ship development still needs to be overcome. The future value of big data can only be realized through organizational and cultural change in combination with the acceptance of appropriate analytical tools, skills and practices.

Those in the shipping industry entrenched in a certain way of working may find it difficult to adjust to a new model with different partnerships and different skills. This technical revolution will certainly lead to a fundamental change in the services provided by those at the sharp end of the industry, namely ship builders and classification societies. But ultimately there will be few shipping sectors that will not be directly challenged by the advent of smart ships and data-centric engineering.

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MOL Comfort casualty causes concerns

With the review into the sudden sinking of the 2008-built 8,110 teu **MOL Comfort** in 2013 now complete, the industry is only fractionally closer to determining a definitive cause for the casualty. The investigation by the ship’s classification society Class NK into the loss blamed “uncertainty factors” for the structural failure and could not definitively answer if design and construction or operational flaws had led to the disaster.

The ship broke into two approximately 200 nautical miles off the coast of Yemen in June 2013. There were 11 sister ships of similar design which were all inspected for structural weaknesses shortly after the MOL Comfort incident and nothing of concern was found.

Despite the lack of clear cause, the International Association of Classification Societies has responded to the casualty, introducing new container ship construction requirements for its members. The two new unified requirements (URs) for container ships are URS11A, which is a longitudinal strength standard for container ships, and URS34, dealing with functional requirements and load cases for direct analysis of container ships. Both are scheduled to be delivered in 2015 and are minimum technical requirements¹.

¹ <http://www.iacs.org.uk/news/article.aspx?newsid=184>



Photo: gcaptain.com

The investigation into the loss of MOL Comfort blamed “uncertainty factors”.

“Mega ships” make waves

The recent introduction of 19,000+ teu container ships – the largest ever built – demonstrates the remarkable innovation and growth in size of the industry. Cargo-carrying capacity has increased by 1,200% over the past 50 years and 80% in 10 years. With the prospect of even larger ships on the horizon, the increasing loss potential means risk management may need reviewing...

GREG DOBIE

During the 1960s there was increasing recognition that containerization offered significant advantages for the transportation of non-bulk goods by sea. And so it was that four shipping companies, P&O, Blue Funnel, British & Commonwealth, and Furness, Withy formed Overseas Containers Ltd (OCL).

On March 6, 1969 the 1,500+ teu capacity **Encounter Bay** (227m long, 30m breadth and 16m depth, 26,755 gross tonnage [gt]) undertook its maiden voyage from Rotterdam; traversing the Europe/Australia trade route.

DID YOU KNOW?

Container ship capacity is measured in 20-foot equivalent units (teu). Typical loads are a mix of 20ft and 40ft containers.

Fast forward almost 50 years later and on January 25, 2015 a very different type of vessel departed Dalian in China, on its own maiden voyage, which would see it calling at Tanjung Pelepas, Malaysia and Algeciras, Rotterdam, Bremerhaven, Wilhelmshaven and Felixstowe on the Albatross trade route between Asia and Europe.

With a nominal capacity of **19,224 teu**, the Mediterranean Shipping Co's (MSC) latest vessel, the 395m long, 59m wide, 30m in depth, 193,000gt, **MSC Oscar** dwarfs the dimensions of the Encounter Bay and is the largest container ship in the world at the time of writing.

This colossal vessel has a deck area equivalent to four football fields laid end-to-end and in a single voyage could carry a cargo volume equivalent to 57.7million garments or **2.4 million microwave ovens**, according to MSC. To put this into further perspective if the MSC Oscar was stood upright out of the water its total vessel length of **395m** would make it taller than the **Empire State Building** (381m).

The "mega ships" are coming

Yet 19,000 teu is not expected to be the cap on container ship sizes. Indeed, many industry commentators believe ships as large as **22,000 teu** are expected to be in service as early as 2018.



MSC Oscar

- Built and launched at Daewoo's shipyard in South Korea in 2014
- Cost £93m (\$140m)
- Named after Oscar, son of Diego Aponte, president and chief executive officer of MSC
- Deck is the size of four football pitches
- Draught (distance between bottom of hull and the boat's waterline) is 50ft (16m)
- Could carry 1.15 million washing machines
- 35 crew members

Source: MSC

"Then the next stage will be **24,000 teu ships** but there are many problems to overcome before we increase the size of container ships further," **Senior Marine Risk Consultant and Master Mariner, AGCS, Jarek Klimczak** tells **Global Risk Dialogue**.

However, the arrival of such "**mega ships**" is accompanied by concerns about increasing risk, safety issues, salvage difficulties and therefore the potential for higher losses if a casualty occurs. These ships test port and canal capacity, as well as the skills of their crews. "From a technical standpoint, it is always much easier to increase the breadth or width than the length, as a wider vessel has better stability," Klimczak adds. But on

“Many industry commentators believe ships as large as **22,000 teu** are expected to be in service as early as 2018”



For more information visit www.agcs.allianz.com/insights/white-papers-and-case-studies/safety-and-shipping-review-2015/

the flipside you then introduce a problem with torsion. Other obstacles include the deeper draft needed, which ports are not ready for and restrictions on cranes which do not currently have enough outreach.”

Senior Marine Risk Consultant at Allianz Risk Consulting, AGCS, Captain Andrew Kinsey adds that there are also issues with the wider logistics chain. “Yes, we can build

20,000+ teu vessels, but is it economically feasible for the supply chain to have those vessels? We have to look at the supply chain as an integrated system, which is only as strong as its weakest link.”

As Klimczak points out, operation of such vessels is limited to a small number of deep water ports – which means an increased concentration of risk. “There is also a world-wide shortage of qualified seaman to command these vessels,” adds Kinsey. It has been estimated that **80%** of marine casualties are down to human error.

Therefore, the industry should think long and hard before making the leap to the next size up, adds **Captain Rahul Khanna, Global Head of Marine Risk Consulting, AGCS.**

“As much as I support technological advances and development we need to be careful how we go about this. If we are going to go bigger than 22,000 teu then risk management needs to go back to the drawing board, especially in the light of the **MOL Comfort** accident (see page 13).”

Loss potential

Another risk factor with ever-larger container ships is **the loss potential**. AGCS experts believe that the industry should prepare for a **\$1bn+ loss** in the future. “For us, exposure is a concern, not just on the total loss, but also on a partial loss or general average claim,” explains **Dr Sven Gerhard, Global Product Leader, Hull & Marine Liabilities, AGCS.**

“A machinery claim or water ingress on such a large ship means that it will need to be unloaded, but where are the facilities to do it, how long will it take, and how much will it cost?”

There are many variances and factors to consider when evaluating the cost of a potential loss scenario resulting from an incident involving a mega ship. Most significantly, the average value of the contents of the containers and whether the vessel is completely laden or not, but also other influences such as shipping route/location.

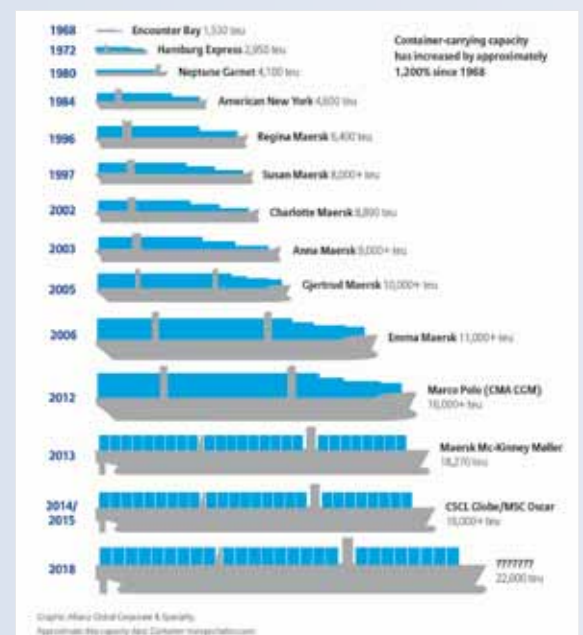
In addition, if there is a salvage/removal of wreck situation, the major concern is that salvors do not have the equipment and resources to effectively deal with this. Such uncharted territory makes potential costs even more problematic to calculate, according to **Kevin Whelan, Marine Claims Specialist at AGCS.**

\$2bn might be exceeded...

Is a **\$2bn** container ship loss scenario possible? “It is not entirely unrealistic,” says Khanna. “We have already seen a passenger ship case (**Costa Concordia**) where the final loss figure is around \$2bn. This is mainly due to the cost of wreck removal and if an equivalent wreck removal process is used in the case of two 19,000 teu vessels, then cost could exceed \$2bn.

“This is quite a rare scenario but \$2bn might be exceeded even if one 19,000 teu vessel and another smaller vessel is

50 years of Container Ship Growth



Source: Safety and Shipping Review 2015, Allianz Global Corporate & Specialty

involved, if there is a wreck removal in a difficult location. It also depends on the response from the local authorities.”

According to Kinsey, the casualty incident would not have to be in a remote location in order to incur this level of loss. “Just the acreage required to stage all the containers in the event of a general average claim between two of these sized vessels would be staggering. And if you combine that with a lack of adequate port infrastructure for fire-fighting, etc...”

Kinsey cites the recent case of a collision between two container ships in Malaysia’s Port Klang in late October 2014 as an example. The **San Felipe** (8,700 teu) struck the moored **Al Riffa** (13,500 teu) while approaching its berth. The collision resulted in fires in the forward container bays aboard both vessels. Luckily, in this case the fire was brought under control.

Losses significantly underestimated

Klimczak says while a \$2bn loss scenario may appear highly unlikely it cannot be entirely discounted and considered impossible.

“It’s a fact that vessel dimensions are growing. Not just for container vessels but also for very large ore carriers and very large bulk carriers, as well as specialized large floating offshore facilities which don’t have any predecessors.

“It is human nature to explore and test the limits; and existing maritime infrastructure and insurance will have to follow. In future, maximum exposure will not necessarily be limited by the value of a vessel and carried cargo but also environmental, social or business interruption costs.

“The cost of claims may be very difficult to estimate and, looking at the history of the most expensive shipping accidents, may be significantly underestimated,” he concludes.

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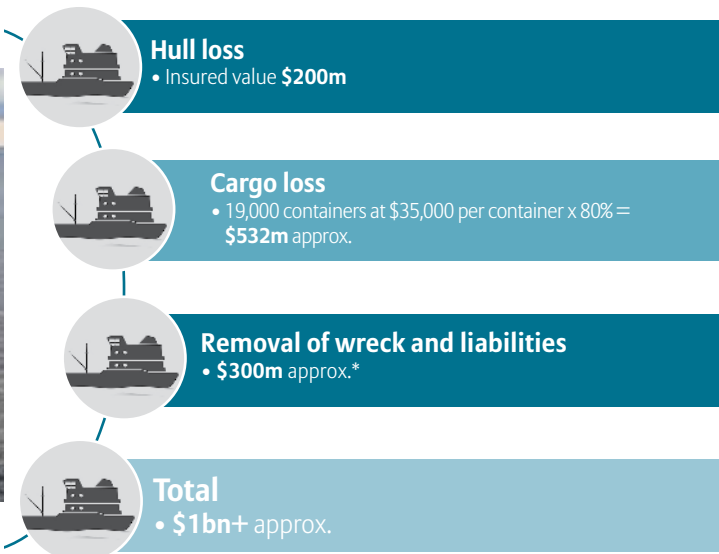
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A billion dollar shipping loss scenario

A new 19,000 container vessel (80% laden) capsizes/sinks resulting in a total loss of the vessel and subsequent removal of wreck




* Costs can vary here. For example, \$190m approx. in the case of the *MSC Napoli* in 2007 and \$425m approx. in the case of *Rena* in 2011



More than two million people lined the streets of New York in 1928 to celebrate the arrival of the **Bremen**; the first transatlantic airplane flight from east to west.

In 1915 Allianz started an aviation insurance business. The underwriting of its first airship insurance policy in Germany commenced what, this year, becomes a century-old partnership with the flight industry.

Global Risk Dialogue examines some of the significant developments that have shaped this relationship – from the daring exploits of the early aviation pioneers to the sector’s evolution into a global business on which \$2.4trn is dependent – and looks at the challenges to come...

1914 11 years after the Wright brothers power the first flight, the first scheduled commercial airline flight occurs – from St. Petersburg to Tampa, Florida, US 

With just a few hours of fuel remaining, a **German Junkers W 33 aircraft** landed on a frozen reservoir on the remote Greenly Island, Canada on April 13, 1928. After 36 hours of flying in harsh conditions with just a magnetic compass to navigate by, the three-man crew of the Junkers **'Bremen'** had just made history, completing the first successful transatlantic airplane flight from east to west.

The trailblazing flight, which came just one year after Charles Lindbergh completed the first solo transatlantic flight, was insured by a pioneering insurer, Allianz, which in 2015 celebrates 100 years of underwriting aviation insurance.

"Allianz has been a partner to the aviation industry for much of its history (*the Allianz group also marks its 125th anniversary this year*). Since insuring some of the very first aviation risks in 1915 we have evolved into a global aviation insurer with clients ranging from small gliders and balloons to the world's largest airlines, airports and manufacturers," says **Henning Haagen, Global Head of Aviation at AGCS**.

As well as pioneering moments like the success of the Bremen, Allianz has also supported the industry through more tragic times, such as the **Hindenburg disaster** (see page 22), for example – Allianz insured the airship that crashed in 1937, one of the world's first serious air accidents.

"It is unique in our industry to be able to look back over such a long time. While our business has evolved to meet the changing needs of the aviation sector over the past 100 years, the continuity of our offering has remained a key benefit to our clients," Haagen says.

Pioneering years

The first three decades of the 20th century were pioneering days for aviation, in a world seemingly full of technological progress. In 1900, the first ridged framed airships took to the skies while the Wright Brothers made their legendary first airplane flight in 1903. Over the following three decades the first aviators pushed man and machine to the limits, with many losing their lives in the process.

In the 1920s the world was gripped by the exploits of the early aviators, and the race to cross the Atlantic

turned the likes of the Bremen crew into international celebrities. More than two million people lined the streets of New York to welcome the two pilots, Hermann Köhl and Major James Fitzmaurice, and the owner of the aircraft, Ehrenfried Günther Freiherr von Hünefeld.

In the same year that the Bremen made history, the Graf Zeppelin airship – operated by the world's first airline, Deutsche Luftschiffahrts-Aktiengesellschaft – began the first ever non-stop transatlantic passenger flights. Early first fixed-wing airlines also began ferrying passengers and mail in the 1920s – Dutch airline KLM was established in 1919, making it the oldest continuously operating airline in the world – although commercial air flight wouldn't take off in a big way until the advent of the jet age from the 1950s onwards.

Jet age provides take-off

The introduction of jet airliners, which enabled airlines to fly further and cheaper, was a key milestone for the development of the aviation industry, explains **Josef Schweighart, Head of Aviation Germany at AGCS**. "The aviation industry really began to develop with the start of the jet age in the post-war period. Previously the aviation industry had not been commercially-driven, but all this changed with big leaps in technology after the Second World War that led to significant year-on-year growth."

In 1950, flying was a luxury that few could afford, with just **31 million** people taking to the skies compared with **3.3 billion** during 2014. Fast forward to today and there are now almost **1,400 airlines** operating worldwide, with a total fleet of **25,000 aircraft**. The aviation industry today is a critical component in the global economy - with some **\$2.4 trillion** of economic activity and **58 million** jobs worldwide dependent on it, according to The International Air Transport Association (IATA). Around one third of goods by value traded internationally are transported by air.

"The aviation industry is closely linked to globalization and economic development. Without the ease of mobility and connectivity provided by air travel, economic growth in Europe and the US would have taken a very different route," says Schweighart...

 Allianz starts its aviation insurance business in Germany, insuring airships **1915**

A history of risk sharing

As the aviation industry began to grow more rapidly after the First World War, so too did demand for aviation insurance. Underwriting aviation risks was to prove particularly challenging during the first decades of the 20th century, while the increasing international reach of the industry necessitates new solutions today.

Aviation risk was generally considered too volatile for individual insurers, leading companies to join together in a bid to share the risks – a model that is still followed in the commercial aviation sector today. Key to the development of the aviation insurance market over the subsequent decades was the establishment of aviation pools.

“In the early days, aviation risk was considered so unpredictable and extraordinary that it was almost impossible for a single insurer to underwrite 100% using its own capacity,” says **Josef Schweighart, Head of Aviation Germany at AGCS**.

The German pool

Allianz took a leading role in what was to become the German Aviation Pool (**Deutsche Luftpool**), first established by a group of German transport insurers to insure “**own risks**” in 1920, and later extended to accident and liability insurance from 1924.

The German Aviation Pool, which continued as the main source of aviation insurance in Germany up until the 1970s, was led by Allianz from an early stage. The pool functioned as a reinsurance company, offering its members and associated companies the chance to protect themselves from risk.

“Allianz became the de-facto aviation risk underwriter in Germany, acting as the German Aviation Pool’s underwriting department, writing aviation insurance business on behalf of the German market,” says Schweighart.

End of an era

Aviation pools continued to play an important role in providing the levels of capacity required by the world’s airlines for much of the 20th century. However, the role has

since diminished as large specialist aviation insurers are now able to underwrite much larger lines of coverage.

The German Aviation Pool ceased active underwriting in 2003, in part a response to the large losses inflicted by the terrorist attacks in the US on September 11, 2001 (*see page 21*), as well as changes to EU competition rules regarding co-insurance arrangements.

Local culture, global reach

Despite the globetrotting image of aviation, the industry has historically been national in nature, although this has been changing, especially due to the impact of the London market with its international clients.

Passenger Liability Regimes: Warsaw/Montreal Conventions

An important driver for aviation insurance was the development of passenger liability regimes, at both a national and international level.



Significantly, the Convention for the Unification of Certain Rules Relating to International Carriage by Air (Warsaw Convention) was signed at Warsaw on 12 October 1929. The law has since been amended, and was replaced by the 1999 Montreal Convention. Today, airline passenger liability is governed by a combination of international and national law, which can make claims settlement complex.

1920

Origins of the “Luftpool” in Germany: an association of Allianz and other insurers to collectively insure aviation hull risks



“In 1950, flying was a luxury that few could afford, with just **31 million** people taking to the skies compared with **3.3 billion** today”

Even today, national differences in aviation culture persist, explains **Thomas Cahlik, Head of Mediterranean, Aviation, AGCS**. For example, France has historically been strong in aviation, especially in aerospace, where four of the global aerospace companies are based (Dassault Aviation, Safran SA, Thales Group and the multi-European Airbus Group).

Yet aviation companies, especially large airlines and manufacturers, as well as general aviation and aerospace firms, are increasingly international in their reach.

“In order to be successful aviation market insurers need to take a global view,” says **Henning Haagen, Global Head of Aviation, AGCS**. “Whether from Asia or North America, an airline today requires the same risk standards of service and offering, he says.

For example, international insurance solutions have become a key offering in the aviation sector and are very important for businesses such as product manufacturers and airport support services, which have been expanding beyond their national markets in recent decades.

Increased footprint

While Allianz began underwriting aviation risks for airships in Germany, over the past 100 years it has increasingly become more diversified and international. After initially underwriting international risks through the German Aviation Pool, it built a local presence in key aviation markets, in part through acquisition.

Over the past 100 years Allianz’ aviation business has grown its global footprint and increased its product offering – it now services clients flying over 160 countries. In recent years the insurer has been consolidating its regional aviation platforms, creating a global aviation insurer that can service clients consistently, both locally and globally.

This has been a major change in how Allianz underwrites aviation business, according to Haagen. “We need to be local to underwrite and service the risks,

but we also need to be able to take the global view, especially when it comes to the large risks,” he says.

Consistency and flexibility

Aviation risk is a volatile risk that benefits from being integrated into a large well-diversified insurance group. Large aviation insurers are also able to write large limits locally without the need to rely on reinsurance.

“We are able to service clients locally, but with the benefit of a robust and diverse portfolio,” says Haagen. “Aviation business has always formed an integral part of our group offering. Many insurers see aviation as a diversification play, but for us it is a core part of our business.

“In the current market there is opportunistic market capacity being offered. Allianz has shown that it is not just here for short term gain. We have been writing aviation insurance for 100 years and are here for the long term. That is a strong message,” Haagen says.

World Trade Center

September 11, 2001

was a major test for the insurance industry and the aviation sector. The terrorist attack, which destroyed the World Trade Centre in New York, with the tragic loss of many lives, also sparked litigation against a number of airlines, and a debate on the ability of insurers to offer terrorism insurance.



The disaster tested aviation underwriters and pools, causing many to rethink their strategy. Some national insurers and pools questioned whether they should be backing international risks.

1928

First transatlantic flight from East to West in a Junkers W 33 aircraft by Hünefeld, Köhl and Fitzmaurice, insured by Allianz.





Photo: Wikimedia Commons

Safer skies

Since the Wright brothers launched the era of powered flight in 1903 the industry has continued to improve its safety record.

Aviation accidents continue to horrify till this day, yet safety has been the highest priority for the aviation industry over the past 100 years. Big improvements in technology, training and risk management have together resulted in laudable improvements.

STUART COLLINS

Safest form of travel

Despite the recent tragic loss activity, flying is often said to be the safest form of transport, and this is at least true in terms of fatalities per distance travelled. According to the Civil Aviation Authority, the fatality rate per billion kilometres travelled by plane is **0.003** compared to **0.27** by rail and **2.57** by car.

Statistically, you have more chance of being killed riding a bicycle or even by lightning. The chances of dying in an air crash in the US or Europe are estimated to be 29 million to one (*see page 24*).

“When I started in the business almost 30 years ago, my boss had one basic message: You have to expect an average of 20 jetliner losses around the world every year,” recalls **Josef Schweighart, Head of Aviation Germany, AGCS**. “Thankfully, such statistics are now history,” he says.

“There has been a staggering reduction in the numbers of both fatal accidents and fatalities in the intervening decades, the result of technology, improvements in air traffic control and pilot training,” he adds.

1937

The Hindenburg, the famous German dirigible, is destroyed by fire and an explosion of an unknown origin during landing proceedings at Lakehurst, New Jersey on May 6. 36 people lost their lives. The Hindenburg was insured by Allianz.



1952

Launch of the jet age. The first commercial jetliner, the De Havilland Comet, enters service.



Positive statistics

Fatal accidents have fallen every decade since the 1950s, a significant achievement given the massive growth in air travel since then. In 1959, there were 40 fatal accidents per one million aircraft departures in the US. Within 10 years this had improved to less than two in every million departures, falling to around 0.1 per million today.

The improvements in safety are even more impressive when the increase in air traffic is considered. In 2014, the world's airlines carried a record 3.3 billion passengers in 2014. There were 641 fatalities and 12 fatal accidents last year, according to the International Air Transport Association (IATA)¹.

While the fatality rate significantly increased year-on-year (there were 210 fatalities in 2013), IATA says commercial aviation safety is still at **"the lowest rate in history"** based on hull losses per one million flights.

By these figures, the 2014 global jet accident rate was **0.23**, the equivalent of **one accident for every 4.4 million flights**. This was actually an improvement over 2013 when the global hull loss rate stood at 0.41 (an average of one accident every 2.4m flights). Both beat the five-year rate (2009-2013) of 0.58 hull loss accidents per million flights. Go back 50 years – when airlines carried only 141 million passengers – there were 87 crashes killing 1,597 people.

Engineering excellence

The improvement in airline safety is down to a combination of several factors, although the introduction of the jet engine in the 1950s stands out as a major development. Jet engines provide a level of safety and reliability unmatched by the earlier piston engines. Today, it is said that engine manufacturers have almost eliminated the chance of engine failure.

The introduction of electronics, most notable the introduction of digital instruments – known as the 'glass cockpit' (*see page 25*) in the 1970s – and the advent of fly-by-wire technology in the 1980s are also

notable achievements, driving safety improvements. Improvements in sensors, navigation equipment and air traffic control technology, such as anti-collision control systems, have also played a role.

"There have been significant improvements in aircraft airframes, engines and avionics since the 1970s, with piston aircraft now largely replaced by the more reliable turbine aircraft," says **Jon Downey, Head of Aviation – US, AGCS**.

"In 20 years' time we may see more fundamental changes in aviation technology, driven by the economic and environmental concerns of fossil fuels"

Human factors

While technology has helped drive improvements in the aviation industry's safety record, great strides in safety management systems and insights into human factors have also contributed significantly.

"Aviation accidents are a chain of events that almost always involve an element of human error," Downey says.

"However, the safety culture in the aviation industry has changed significantly during my career. Flight training has become a more controlled and professional environment with the development of recurrent training. The utilization and technological enhancement of flight simulators has been one of the biggest changes I have witnessed."

¹ not including the 298 deaths arising from the shooting down of flight MH17 in July 2014, which is not classified as an accident

1955

The German aviation sector is boosted when a re-formed Lufthansa gains approval to start scheduled flights.



Recurrent training, in which pilots and crews refresh their skills and prepare for emergency situations, was initially introduced in the airline sector and is now making a positive impact in all sectors of aviation, explains Downey.

“Safety management systems have radically changed the view of the human factor in the airline sector and are now making an impact in the general aviation world,” he says.

Another important safety development in recent decades has been in the area of crew or cockpit resource management and the monitoring of data, which are aimed at reducing the risk of human error. For example, cockpit data monitoring systems – including digital audio and visual recording equipment – are now widely used to identify safety trends that can be addressed by training, as well as to investigate causes of accidents.

Learning process

Improved safety is also a reflection of the aviation industry’s first-class risk management and increasing ability to identify problems before they become a significant issue. Air accident investigations and aircraft safety inspections are now more effective, while improvements in manufacturing technology and better quality control are also making aircraft safer.

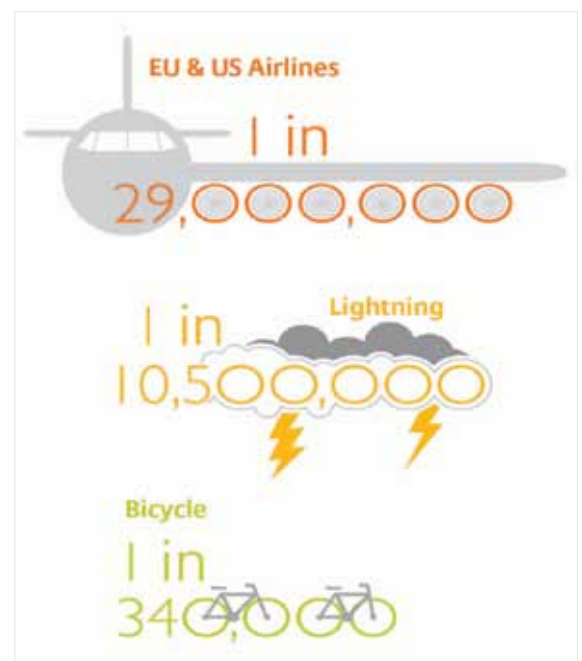
“Aviation companies have always focused on safety – but the tools available to run airline risk management departments and identify problems before they become critical, have improved greatly,” says Schweighart.

Where next for safety?

While the accident rate improved yet again in 2014, questions remain over the industry’s ability to maintain safety improvements in the future.

Further improvements in safety, while likely, are not guaranteed, according to **Thomas Cahlik, Head of Mediterranean, Aviation, AGCS**. Aviation experiences periods of innovation – such as the recent development of composite materials or lithium batteries– which can nevertheless result in losses.

Chance of a fatality... What are the odds?



Source: Global Aviation Safety Study, Allianz Global Corporate & Specialty

IATA notes that, given the projected growth in air travel, hull losses would double without further safety improvements. It has set a goal of further reducing the accident rate, but says that new and improved ways of managing safety will be required, such as with the greater use of data analytics.

Tapping into the potentially vast pool of data collected by more than **27 million flights each year** – rather than just the handful of flights where something goes wrong – will be key to improving safety in the future, according to IATA. For example, the airline industry is now looking to make greater use of data through IATA’s Flight Data Exchange (FDX), which uses flight recorder data to identify systemic risk issues.



New technology - new risks

Aircraft technology has changed dramatically, both driving improvements in safety and shaping the industry's risk profile. Further innovations will be required in future, particularly if flying is to be kept affordable...

Photo: Wikimedia Commons

Solar-powered planes are one of the more recent aviation design innovations.

The aviation industry's impressive safety record in recent decades is in large part a reflection of technological developments introduced and then honed in the second half of the 20th century. Subsequent generations of jet aircraft have generally proved safer than the last.

The piston-driven aircraft that dominated the world's airline fleet in 1960 had an accident rate of 27.2 accidents per million departures. The second generation of aircraft in the latter half of the 1960s and early 1970s, which included the Boeing 727 and the DC-9 jet airliners, had an accident rate of 2.8 accidents per million. The current generation of aircraft have an accident rate of 1.5 accidents per one million departures.

Next generation

Aircraft design may eventually have to change more dramatically, especially if flying is to be kept affordable as fuel costs climb in the future. This could bring about new forms of propulsion – such as electric, hybrid or solar powered planes – radical new airframe designs, as well as new techniques, like assisted take-offs or unpowered landings.

"In 20 years' time we may see more fundamental changes in aviation technology, driven by the economic and environmental concerns of fossil fuels," says **Josef Schweighart, Head of Aviation Germany, AGCS.**

New materials and computer-aided aviation

In the meantime, the aviation industry continues to innovate, most recently with the introduction of composite materials and the increasing use of digital technology and electronics.

"The new generation of airliners are very innovative, but it will take time – at least several years – to see how resistant the materials will be," says **Thomas Cahlik, Head of Mediterranean, Aviation, AGCS.**

Many of the new technologies have helped improve safety, such as better cockpit instrumentation displays and fly-by-wire systems. However, technology has a potential for creating unanticipated consequences, according to **Jon Downey, Head of Aviation – US, AGCS.**

"Once, pilots relied on their 'steam gauges' and had very little live data at their fingertips. Now the information available can be overwhelming," he says.

While 'glass cockpit' technology gives much better visual awareness it also raises issues, as was seen in the loss of the Air France Flight 447 in 2009 with 228 people on-board. Accident investigators concluded that the pilots became confused by the plane's instrumentation and took inappropriate action when the Airbus 330 flew into turbulence during a tropical thunderstorm over the Atlantic Ocean.

Concerns over pilot's reliance on automation in the cockpit were also raised by the Asiana crash in 2013 (*see page 28*).

"What we see now is an increasing reliance on technology, that pilots may not fully understand, that at some point this can diminish a pilot's situational awareness and stick and rudder skills," says Downey.



The German "Luftpool" now also offers aerospace risk insurance solutions.

1985

The changing loss landscape

Photo: Shutterstock

The Hindenburg is regarded as one of the world's first serious air accidents.

Improved safety is resulting in fewer major catastrophic claims for insurers overall, despite the activity of the past year. However, the cost of everyday losses is rising.

STUART COLLINS

The much-improved safety environment of recent years has contributed to the fact that premiums for aviation insurance, which helps to protect the sector against a number of risks, were at their lowest level for many years, prior to 2014's, and this year's, loss activity. And premiums are still at their lowest ever when compared with exposures.

There has been a **50%+** increase in exposure since the turn of the century, driven by increasing fleet values and an increase in passenger numbers. Exposures have risen from **\$576bn** in 2000 to **\$896bn** in 2013 – if exposure growth continues at the same rate, it will top **\$1trn** by 2020.

“Rate reductions over the past decade reflect improvements in the underlying exposure. However, reductions in the airline and aviation market in the past two years have not been driven by risk management improvements, but by overcapacity in the insurance market,” according to **Josef Schweighart, Head of Aviation, Germany, AGCS.**

Rising costs

While improved safety has resulted in fewer catastrophic claims for insurers, the costs of everyday claims has been rising. Aviation claims are generally becoming more complex to handle and more expensive, reflecting higher values, increasing repair costs, rising compensation payouts and more stringent litigation.

“Exposures in aviation are changing. Safety is improving, which reduces frequency of loss, but severity has been increasing. Today we are seeing a significant change in the underlying risk,” says **Henning Haagen, Global Head of Aviation, AGCS.**

New vulnerabilities

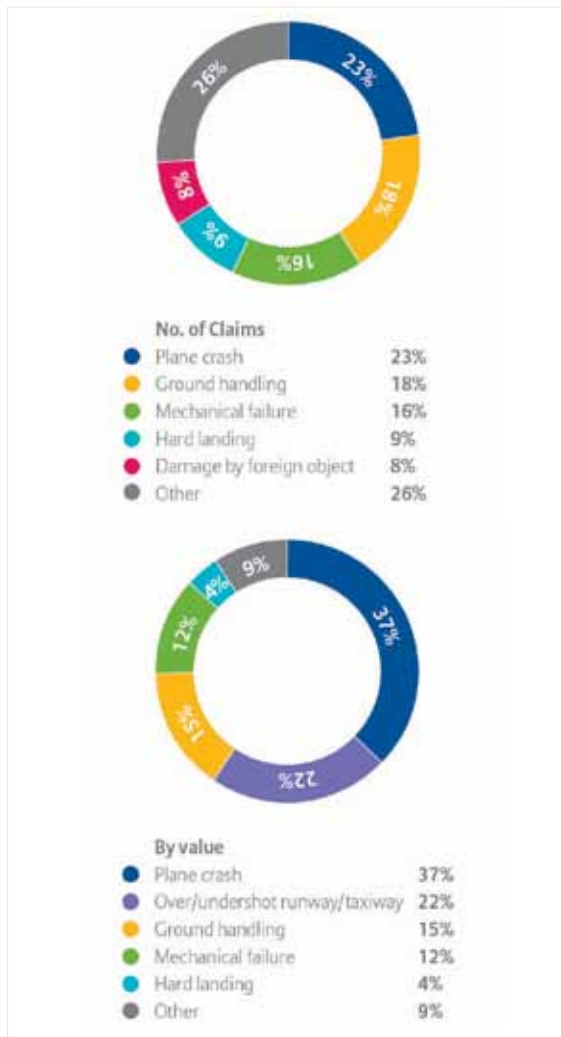
Technology that helps drive improvements in safety and reduce catastrophic losses also brings new vulnerabilities and potentially higher costs for insurance claims. Aircraft are now far more complex, using new materials and components – there are on average 600,000 parts on a typical jet airliner.

2001

Terrorist attacks on World Trade Center in New York, US on September 11.



Top Causes of Loss: Aviation Claims (€1m+)



Source: Global Claims Review, Allianz Global Corporate & Specialty. Data based on accident years 2009-2013

New materials, such as the composite materials used in the wings and airframes of the latest generation of aircraft, are more time-consuming and expensive to repair, requiring expert technicians.

For example, **AGCS Head of Aviation – US, Jon Downey** recalls two separate claims for Cessna jet aircraft damaged in a hailstorm. In the absence of a repair protocol for their composite-built wings, the aircraft were a total loss at \$7m to \$8m. In the past, aluminum would have been repairable at a much lower cost, he says.

“New materials can lead to new losses, but it is the speed of innovation and the need to keep pace with understanding the risks that is the major challenge today compared with the past,” adds Haagen.

The increasing complexity of aircraft also means that many components need to be made to order, while manufacturers and Maintenance, Repair and Overhaul (MRO) contractors hold fewer spare parts. There is also a trend towards manufacturer-led repairs, (rather than potentially cost-effective MROs), a trend that is likely to continue as aircraft become even more complex.

Higher limits

Claims costs are also affected by values, which have been steadily increasing across the board, from the largest airliner to corporate jets. An Airbus A380 was the first aircraft to require an insured limit in excess of \$2bn while the hull of a Dassault Falcon 7X business jet is now typically insured for around \$60m to \$70m.

The trend towards a more litigious society in parts of the world, and growing compensation payouts is another area driving up the costs of claims. With improved accident investigation, it is now easier to determine liability and potentially sue a number of parties involved in a loss – including the airline, manufacturer and the general aviation firms that provide components and services.


Product evolution

Insurers will need to consider how to respond to changes in the underlying exposures and improvements in risk management and safety in the aviation sector, according to Haagen.

Advancements in technology and risk management mean that potential issues with a component, engine or airframe are picked up before they become catastrophic losses. As a result, airlines and manufacturers may have to ground an entire fleet, with resulting product recall and business interruption losses.

For insurers, which have historically limited their involvement in product recall, this may mean adapting their product offering.

“Insurers need to adapt to aviation industry developments. For example, technology and safety-driven developments will require underwriters to understand clients better to make sure we keep pace and are relevant,” says Haagen.

2003 The German “Luftpool” ends its business as re-insurer of aviation risks. 

The risks of the future

Innovation, climate change and managing future growth are among the risks likely to challenge the aviation industry in coming decades.

Prospects for the aviation industry look good, with growth in passenger numbers expected to reach **16 billion by 2050**, a 384% increase on today's numbers. Air freight is expected to increase to **400 million tons** from just 50 million today, according to the International Air Transport Association (IATA).

Growth in air travel will have ramifications for the industry's risk profile. For example, there will be a shift in flying and large hubs towards Asia and the Middle East, where populations are growing and where there have been large increases in infrastructure in recent years.

Mergers and acquisition among ground support companies and aerospace firms has picked up in recent years as companies look to expand overseas. Regional consolidation of airlines is on-going, but while there has not been a large cross-continental merger – between a European and US or Asian airline, such a move is only a matter of time.

Longer term, the aviation industry may have to explore more revolutionary forms of technology. If they are to achieve the expected growth potential, airlines will need to address the high financial and environmental cost of traditional fossil fuels.

"The next big challenge for the aviation industry will be to keep flying affordable and find a way out of pure fuel-driven propulsion," says **Josef Schweighart, Head of Aviation, Germany, AGCS**.

Climate change could also have more direct effects on flying. Scientists predict that turbulence on the North Atlantic flight corridor could increase by **40% to 170%** if carbon dioxide emissions double by 2050, as the International Energy Agency forecasts.

"Macro trends reaffirm the need for large global aviation insurers, and for underwriters that understand the changing nature of aviation risk," adds **Henning Haagen, Global Head of Aviation, AGCS**.

Risk management challenges

Outside of a terrorist threat, business interruption and supply chain risks are among the greatest concerns for the aviation industry, according to the **Allianz Risk Barometer 2015**, an annual study of risk consultants, senior managers and claims experts.

"A problem with a component, engine or airframe can now lead to the grounding of an entire fleet," says Haagen. For example, technology problems on-board the new Boeing 787 Dreamliner saw the entire fleet grounded for three months while a solution was found.

In addition to the increasing risk of business interruption, there are a number of emerging risk challenges for the aviation industry, including those posed by new technologies – like composite materials – and human factors, such as how best to counter the potential downsides of increasing automation and information in the cockpit.

With growing demand for air travel, pilot training will become an even bigger issue than it is today. Boeing estimates that some **498,000 new commercial airline pilots** will be required over the next two decades, raising concerns over the industry's ability to fill quotas.

Pilot lapses and automation have been implicated in a number of recent incidents including the Asiana Flight 214 accident in San Francisco in 2013, suggesting that continuous training should help prepare pilots to fly and recover aircraft when automation fails, as well as addressing passivity in the cockpit from a reliance on automation.

Two other technology-related emerging risk areas for aviation likely to feature increasingly in coming years will be the threat a cyber-attack could pose to the aviation sector as well as the increasing use of **Unmanned Aerial Vehicles (UAVs)**, more commonly known as drones.

Cyber: "the biggest focus"

The aviation sector now relies on computers for almost every aspect of its business. And with this growing reliance,

2006

Allianz Global Corporate & Specialty (AGCS), which insures aviation, and a number of other corporate risks, is founded by pooling subsidiaries of Allianz.





Discover more about the aviation industry's safety record and the developments that will impact aviation in future in AGCS' Global Aviation Safety Study at www.agcs.allianz.com/insights

the industry faces an increasing threat from cyber risk, including cyber terrorism, extortion, data breaches and network outages.

"In the next five to 10 years, cyber will become the biggest focus of the aviation industry," predicts Haagen. Cyber risks are not currently excluded in aviation insurance policies, however, the aviation industry and its insurers will need to develop their understanding of the risk to prevent losses and risk accumulation, he adds.

UAVs: excitement and concern

The advent of UAVs is causing excitement in the aviation world, and concern among airline pilots. The majority of UAV systems are operated by the military but as the technology matures, increasing numbers of units will find commercial uses, like conducting surveys of pipelines, border patrols, and filming sports events and movies. The US' Federal Aviation Administration (FAA) has predicted the number of UAVs in the US will rise to approximately **15,000 units** by 2020 and **30,000 units** by 2030.

However, the growing use of UAVs is a safety concern for the British Airline Pilots' Association (BALPA). It notes that in 2014 alone, an American Airlines pilot reported narrowly missing a quadcopter at 2,300 feet above Florida while a drone was flown within 20ft of an A320 landing at Heathrow.

Currently, most UAVs are small and light (under 20kg) but capable of reaching around 2,000 feet and posing a risk to passenger aircraft. BALPA believes that large remote aircraft – the size as a Boeing 737 – could operate commercially within 10 years.

Many countries either prohibit or severely restrict the use of UAVs, although the European Union and the US are both looking at ways to safely integrate drones into airspace, including appropriate level of liability and insurance. In the case of the US, its FAA recently proposed a framework of regulations that would allow routine use of certain small unmanned aircraft systems (under 55 pounds [25kg] in weight) in today's aviation system.

Such moves mean that many now believe drone technology is here to stay. And despite concerns for safety, there are also many benefits if drones can be safely integrated and accommodated.

"UAVs could change the aviation world for the better by supplementing the more mundane and dangerous missions, such as surveying pipelines and search and rescue," says **Jon Downey, Head of Aviation – US, AGCS**. "There is a tremendous opportunity to reduce the more hazardous forms of manned flight," he says.

Aviation insurance: more than just passenger jets

Since insuring some of the very first aviation risks in 1915, Allianz has evolved into a global aviation insurer protecting a wide range of risks from the Arctic to the Australian outback – including small gliders and balloons to the world's largest airlines, airports and manufacturers. Some of the more out-of-the-ordinary risks AGCS has covered include:



Photo: Wikimedia Commons

- **Space:** In 2014 alone AGCS insured 21 space launches through its space underwriting team based in Paris, France. The launches covered eight different types of vehicles from around the world
- **Project Orbis** – the first airborne operating theatre for eye treatment in the world
- Telecommunication, earth observation and scientific **satellites**
- **Fire-fighting** and spraying airplanes
- Unmanned aerial vehicles (**UAVs**)
- **Stunt** kites

For more information visit www.agcs.allianz.com/services/aviation/

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2014-2015

The aviation industry is impacted by a number of disasters including the disappearance of Malaysia Airlines flight MH370 and the shooting down of flight MH17 in 2014. In March 2015, the Germanwings flight 4U9525 crashed in the Alps.



Addressing the **talent gap**

The increasingly critical issue of young talent recruitment is affecting industrial insurance and its stakeholders more and more. One of the best ways of actively tackling this issue is to promote a dual course of study, says Thomas Köhne.



THOMAS KÖHNE

Thomas Köhne is Professor of Insurance Management at the Berlin School of Economics and Law (HWR), Chairman of the Institute for Insurance e.v. in Berlin and course director for the dual bachelor degree course in business administration and industrial insurance (BWL/Industrieversicherung). He has 20 years of teaching, researching and consulting experience in the area of insurance management. Information on the degree program can be found at www.hwr-berlin.de/fachbereich-duales-studium/studiengaenge/bwlversicherung/

A shortage of skilled workers and demographic change are making it harder and harder to recruit suitable employees. This is ever more relevant in the area of industrial insurance. With the gradual retirement of the “baby boomer” generation over the next few years, talent gaps will appear. This is compounded by the fact that the

more popular since it combines an academic degree with practical training. It also helps employers reach the best and highly-motivated students at an early stage, accompanying them throughout their studies, attracting them to the company’s own line of business, and ultimately retaining them.

“With the gradual retirement of the ‘baby boomer’ generation over the next few years, talent gaps will appear. This is compounded by the fact the insurance sector doesn’t exactly enjoy a positive image in many quarters”

insurance sector doesn’t exactly enjoy a positive image in many quarters. What this ultimately means is that in the battle with the young talent shortage caused by changing demographics, industrial insurance is in direct competition with other sectors – and faces image-related disadvantages that must be overcome in the process.

Against this backdrop we have conceived a dual bachelor degree course run by the Berlin School of Economics and Law (HWR Berlin) that combines business management and industrial insurance. Over the three year course, the students divide their time between the higher education institution and the partner company, switching from one to the other every three months.

At least the urgency of the situation seems to have been recognized. Market players have recently addressed the issue and voiced their concerns: according to the **Allianz Risk Barometer 2015**, on a global scale the shortage of young talent and executives is the **13th greatest risk** facing companies today. As a result, the German association of insurance companies DVS (**Deutscher Versicherungsschutzverband**) has created a working group, whose aim is to engage with the issue of young talent recruitment and how it can be improved – not just on an association level, but also on a practical level. It’s not just the insurance companies themselves that need to actively train their own young talent; that responsibility also lies with brokers, risk managers and insurance buyers in the industry.

This means that over the course of the three year program, students spend 18 months at the company and can get to know and gradually internalize the industrial insurance business on location. Employers therefore have every chance to convey to young talents the exciting, multi-faceted and challenging nature of employment in the industrial insurance sector – also in comparison with other companies in the industry.

The qualification requirements have changed drastically in recent years. Growing specialization in risk management, underwriting and claims settlement, along with the globalized nature of the business and increasing digitalization means new skills are required. Where technical insurance training was generally the done thing in the retiring generation, today’s generation need to have detailed knowledge of business management and insurance, along with the ability to speak multiple languages. Only a sufficiently in-depth academic education can provide this.

In terms of content, alongside courses traditionally taught as part of a business management degree, the program offers a curriculum that is specifically tailored to the features of industrial insurance, with courses in insurance management, the most important industrial insurance lines, and international programs, so that the special features of the industrial insurance sector are dealt with thoroughly.

Risk management from the perspective of industrial customers is also addressed. In line with this, the course will be taught by a network of experienced professors and renowned industrial insurers, brokers, and captive agents with relevant qualifications.

A good means of tackling this challenge at its roots would be to provide young school-leavers with industry-specific training. This dual course of study is becoming more and

Industrial insurance is an extremely fascinating sector, but it desperately needs young talent. For this reason, all sides need to actively invest in youth development. Dual traineeships in dual degree course programs offer the best foundation for this.

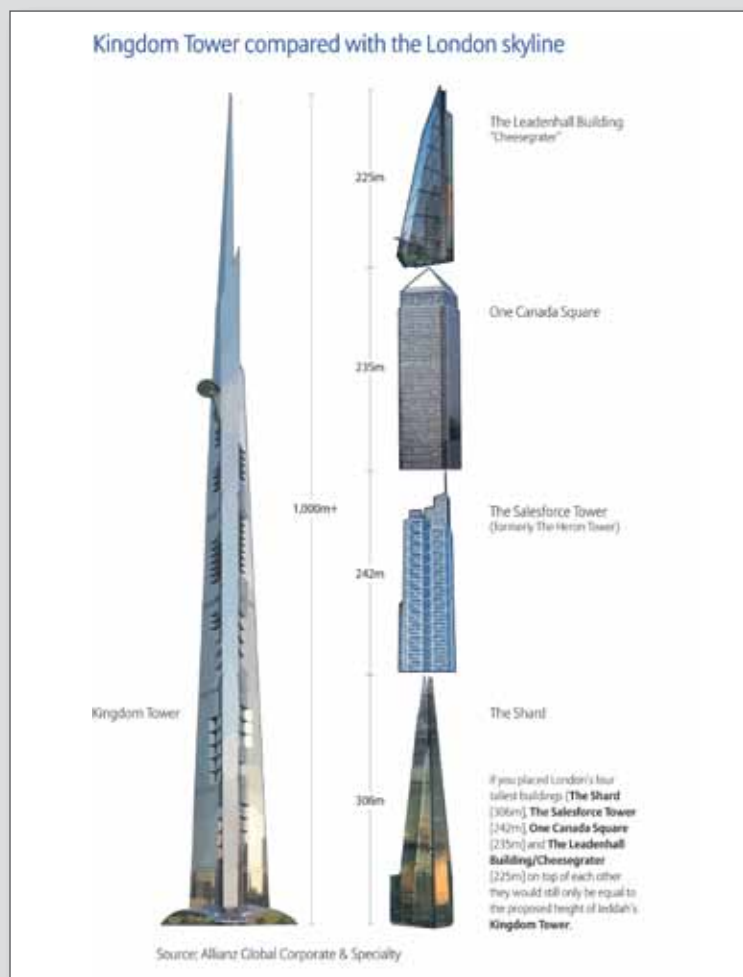
Supertall buildings hit new heights

Visit www.agcs.allianz.com for the latest AGCS news and expert research on topics such as aviation safety, weather risks, top causes of losses for businesses and **construction risks**.

Increasingly complex high-rise building projects present significant risk challenges. Impact of any seismic or natural catastrophe activity – in particular flooding during the construction stage; the threat posed by wind loads and fire; choice of building materials; and the unique complexity of managing projects that can involve as many as 10,000 workers and over 100 subcontractors represent the key risk challenges, according to an AGCS report **Supertall Buildings: Construction Risk Assessment in the 21st Century**.

New risk challenges continue to emerge post-construction as demonstrated by increasing concerns over the potential impact of glass facades on the surrounding locality. Unexpected consequences of building so high with such materials highlights the need for ongoing risk mitigation, the report says.

Meanwhile, the insured values involved with so-called supertall buildings (**300m+**) are increasing, with insurance playing a vital role in ensuring such projects advance past the design stage. Today's newest and largest buildings easily exceed **\$1bn or more** in value. AGCS is the leading reinsurer for the construction of the next building that will hold the title of "world's tallest" – the **Kingdom Tower** which has a total insured value of **\$1.5bn**.



AGCS joins Google+

In addition to being active on LinkedIn AGCS also now has a social media presence on Twitter and, as of the start of this year, on Google+. Viewers can read, like and share Global Risk Dialogue content, expert research on the latest hot topics and all our infographics. To view the page and follow AGCS's activity on Google+ search for Allianz Global Corporate & Specialty at plus.google.com



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