



## AEROSPACE RISK REPORT

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# AEROSPACE RISK REPORT BY RUSSELL GROUP LIMITED: THE ARC OF VOLATILITY

The aerospace industry, which comprises Airlines, Airports, Manufacturers, Commercial GA, Light GA, and the Space/Satellite industry, faces a panoply of growing threats and disruptive forces today. Risk and loss exposures are on the rise for underwriters writing across these aerospace sub-classes. Recent events have thrown the aerospace underwriters into the spotlight, but this insurance class is prone, like most of the specialty classes to political, economic, cyber, credit and business interruption risks too.

In this white paper we explore the aerospace risk panorama today, highlight underlying risk volatility and call for a more integrated approach to underwriting risk management by the insurance industry.

### **Airlines - A Bleak Time for the Aviation Specialty Class**

The airline class has suffered reductions in market premium for at least 5 successive years, over which there have been notable losses and increased underlying exposure. With passenger movements and fleet renewals on the rise, the pricing for airline insurance is now reaching unsustainable levels. Market consolidation may help alleviate the over-capacity in the airline insurance market, but this in itself may present credit risk issues as buyers come to rely on fewer insurers.

### **Airports - Political Risks**

Looking at the wider picture, in Libya last year, militias armed with shoulder-launched missiles battled for control of the country's main airport. In Africa, the entire Sahel region is awash with weapons that include portable air defence systems leftover from the ouster of Moammar Gadhafi. Then there's Syria's civil war, in which thousands of soldiers have defected and set up new battalions that have shot down military helicopters and jets.

Volatile territories stretching from West Africa to Central Asia are putting at risk both commercial and light G.A. flights and airline passengers that could potentially be at risk from ground-based weapons. The destruction of Malaysian Airlines Flight 17 demonstrates the dangers of flight across unstable territory where sophisticated weapons might be available to militants.

### **Airlines - Extending the Terror Franchise?**

The U.S. Federal Aviation Administration (22nd July 2014) told American airlines they were prohibited from flying to Tel Aviv airport for at least 24 hours following the explosion of a rocket fired from Hamas-ruled Gaza in the latest war between Palestinians and Israel. The FAA has also prohibited flights in Libya, northern Ethiopia, North Korea and the eastern Ukraine Crimea region, and prohibited flights below a certain altitude in Iraq and Somalia.

The Malaysia Airlines jet was destroyed last year by a sophisticated surface-to-air missile as the plane cruised at an altitude of 33,000 feet (10,000 meters) above rebel-held battlefields in eastern Ukraine. All 298 people aboard were killed. It is estimated that 50 to 60 countries around the world possess radar-guided high-altitude missile systems like the one that shot down the Boeing 777, according to John Pike, director of military information website GlobalSecurity.org.

### **Airport Correlated Risks – Ground Exposures**

Is it the time to start integrating airlines, manufacturers and airport risks? At the moment the market is very reactive, the Aviation classes only focus on the sub-class where the loss has taken place. A more prudent and reasonable approach for the market as a whole would be to proactively produce a smoother and less brutal increase across the classes to give more certainty to clients and enable them to plan ahead. Who can say these risks are not correlated?

When it comes to airport ground exposures, the Aviation specialty insurance class is confronted with the emergence of new political and terror risks, which are increasingly volatile and often connect a range of different event scenarios. What these risks have in common is that hostile states, terror groups and individuals frequently employ terror tactics that disrupt transport hubs, lines of communication and methods of travel, which is why airlines and airports are often a target, as happened in Tripoli last year.

A number of events and losses should give (re) insurers pause for thought. For example, 246 aircraft have been shot down over Syria since the beginning of the Civil War, \$800 million is the peak aggregate value of aircraft on the ground at Baghdad Airport and \$660 million is the estimated aggregate loss for the Tripoli airport debacle resulting in a potential \$200 million uninsured loss for the airlines.

In an environment in which 16,000 ft. is the latest maximum range of so-called Manpads (man portable missiles) and there are 290 flights in and out of Tel Aviv every day, is it time for airlines to re-assess their exposures?

### **The Outlook for the Global Aerospace Market**

According to a CAPA Global Aviation Industry Outlook – Pursuing certainty in an uncertain world, “Uncertainty has become the new normal – and risk reduction takes on a high priority for many airlines as Europe’s economy stutters and the US struggles for traction.”

The report stated that certain words recur frequently in airline reports to describe their

outlook for the market: “challenging”, “volatile”, “uncertainty” are among the most popular. These are “Understandably in turn accompanied by corporate goals of enhancing the financial position and paying down debt, aligning capacity to demand, reducing costs and adopting more conservative fuel hedging positions, among others.”

Disruption to aerospace is not simply confined to losses caused by acts of war, terrorism or human error in the “real” world, however.

### **Manufacturing - Business Interruption Supply Chain Risks**

Supply chain design is a challenge for the aerospace industry because production expertise and capabilities of the industry’s products is limited. Due to the fact that a high level of performance is expected from aerospace products, it is not so easy to use standard parts as extensively as other industries. As a result, the supply chain is integral to the design process which involves a complex exchange of data and minute scrutiny of contracts, NDAs and ownership of Intellectual Property.

According to Resource Engineering Projects’ director, Paul Martin “The aerospace industry is highly competitive and exists as a complex multi-tiered supply chain requiring suppliers to work closely together on aircraft components.” Aerospace supply chains are hugely complicated multi-dimensional inter-connected networks that operate across geographies, time-zones, war-zones and political regimes.

The point is reinforced by insurance broker Marsh, which says on its website: “For all organisations involved in manufacture or supply of products to the aerospace industry, aviation liability insurance is a critical consideration when assessing potential exposures to a business and its shareholders. Managing risk in the aerospace business is an increasingly complex challenge with ever-increasing litigation and awards being sought around the world.”

### **Economic Headwinds**

Economic headwinds might have an impact on credit and supply chain risks according to a PwC report Aviation Finance: Fasten Your Seatbelts: “Aviation financing is a hot topic and likely to remain so over the coming years, as demand for financing deliveries of new aircraft peaks at a time when long-term financing becomes unattractive for some of the incumbent banks.” As the authors explain: “The ongoing global economic uncertainty, the European Sovereign debt crisis, the recent downgrading of several European banks and increased difficulty of accessing US dollar funding has raised funding pressure.”

Furthermore, the increase in production volumes that have delivered record order backlogs for the Original Engagement Manufacturers (OEMs) could: “put pressure on the supply chain, leaving programmes vulnerable to supply chain delays and failures. To address this risk, OEMs are consolidating and encouraging consolidation of their suppliers. At present, Boeing and Airbus are reliant on over 1,500 direct suppliers spread across various geographies.”

New aircraft deliveries which have an historic record for delays pose a connected risk for aircraft owners and operators who - seeking to replace ageing airframes - either cancel orders all together or default to existing, rather than new technology aircraft to plug their delivery schedule gaps.

### **Airlines - High oil Price, Low Oil Price**

As an aside, it was amusing to read in this same PwC report the following comments that explained the backlog of new mega (aircraft) orders when the report was written in 2013: “A number of factors have contributed to this peak [of mega order activity.] A continued focus by airlines on driving down operational costs in an era where the cost of a barrel of fuel is in excess of \$100 is the ‘new normal’ and with fuel now representing a third of all operating costs.” Looking at today’s low oil price environment - a mere 18 months after the previous sentence was written - it is astonishing how quickly the global economic outlook can change so quickly.

It also serves to illustrate the obvious point, however, that the aerospace industry needs to understand and hedge its risks in today’s dynamic, volatile world.

### **Connected World, Connected Risk**

In today’s increasingly connected world, technological disruptions have the potential to cause major Business Interruption issues. Insurers will need to factor IT disruption event scenarios into their risk and exposure models. As digitalization continues apace and global networks insinuate their way into all walks of commercial life, the threats and damage caused by deliberate or mistaken breakdowns in Information Technology systems are likely to increase exponentially. From an airport operator’s point of view, they might want to consider the use of augmented cyber-insurance products to safeguard against such risks.

The key word here for Underwriters is “connected.” There is a wider concern about cyber exposures more generally and the impact on business interruption. A UK Cabinet Office spokesman has said that cyber-attacks are one of the “top four” threats to the UK’s national security.

### **Spaced Out**

The space and satellite insurance sector faces a number of challenges over the next three to five years.

The key questions Underwriters will need to have answers to in what seems likely to be a diversifying and increasingly crowded space insurance marketplace will be: “Who should I insure and at what price? How can I be more effective and efficient in choosing the risks I decide to underwrite? What do I need to do to model space insurance risks more intelligently?”

What are the internal sector-driven dynamics causing more Underwriters than ever to contemplate entering the space insurance market and what kinds of event scenarios and risk exposures might cause them to exit?

The satellite business is a risky one; insurance is a prominent cost item for any operator. The price for total or even partial launch failures is very high. Today it is clear that operating one or two satellites is risky but that having a fleet of 20 or more poses its own unique challenges requiring risk mitigation strategies in which insurance purchase is key. Consolidation in the space industry comes as no surprise. The industry continues to mature and markets are opening up, and there is a sense that the industry is ready to embrace innovation - a new paradigm even - as new players such as SpaceX and O3b attempt to reduce the cost of satellite deployment and capacity.

### **Substantial Liabilities**

Space systems engineering is a growth industry and its economic capacity is underwritten by a growing number of (re)insurers and risk managers who work closely with insurance broking partners. No commercial space machine can be financed without an appropriate level of insurance coverage. Insurers assume very substantial liabilities and success or failure has a huge impact on underwriting results - in hardly any other class of insurance are the causes of material damage losses or liability so varied and the effects of malfunctions or systems crashes so far reaching.

Cyber risk is also a major cause for concern for Space underwriters, as is the global economy and shifting alliances within that such as rocket launch co-operation between the US and Russia given recent political fall-out from the Ukraine crisis. In the near to medium term the prospect of space tourism and increasing commercial human spaceflight present new challenges.

From the insurance industry’s point of view, Underwriters firstly need to ascertain those parts of the client’s business which are critically reliant

on IT, the threats posed need to be evaluated and the internal processes and controls being used to mitigate the risks need to be reviewed. Secondly, a consultancy approach needs to be adopted which helps clients to understand their risk profile and embed controls within the operation to mitigate such risk. Thirdly, Underwriters need to capture better data on the relationship between vendor technology and client risk profiles, so that potential threats can be evaluated and adequately priced for.

Billions of pounds are being lost in the UK economy from cybercrime each year, including from intellectual property theft and cyber-espionage and industry is by far the biggest victim. The government is working with industry to harden critical infrastructure against attack, and has set up a series of initiatives to share information about threats and the best way to tackle them.

The aerospace insurance market for its part needs to better understand operator risk profiles and underlying risks, modernise wordings, and create flexible and tailored new products that address the needs of modern risk manager buyers.

### **Integrated Underwriting Risk Management**

Many of the issues that we have raised above require an integrated approach to underwriting risk management. It will become more important to have real-time knowledge of underlying accumulated exposure at the time of risk pricing, to encourage more informed risk selection decisions based on optimal capital utilisation and corresponding portfolio return on equity.

Core to such an approach is the simulation of an event set that can then be used for pricing and other risk management analysis, giving consistency of approach. The same event set could be used to inform reserving, business planning, forecasting, and to produce accurate underwriting risk distributions for capital modelling. Outwards

reinsurance could also be priced and analysed on the same basis as the inwards portfolio, enabling the net position to be optimised. Such a simulated event set based on past losses and current exposure movements allows a greater range of loss scenarios to be explored than a purely historical analysis

Although we can learn a lot about studying past aviation losses, the complexity and special characteristics of its various sub-classes mean that these losses are often not a good guide to the future, even when we apply sophisticated techniques for adjusting exposure, and inflating claims.



**Russell Group is a leading risk management software and service company that provides a truly integrated risk management framework for (re)insurance clients operating across the specialty classes through its ALPS suite of products.**

Underwriting risk is, or should be, the primary concern of specialty (re)insurance companies in quantifying portfolio exposure, pricing risk, optimising reinsurance purchase and evaluating the amount of capital needed to support the portfolio. Russell through its ALPS product provides an underwriting risk framework which delivers a complete and integrated understanding of underwriting exposure, capital utilisation and portfolio return on equity.

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