From the ground up

Mark Heath and Richard Powell

For those involved in the aviation and aerospace markets, there can be no hiding the fact that 2014 and 2015 to date have been testing, with both a high frequency and severity of losses.

To give an indication, man-made losses within the aviation sector comprised nearly half of all major claims at Lloyd's last year, contributing to a £310mn ($462mn) hit, net of reinsurance, out of a £670mn total. Meanwhile the Lloyd's aviation market saw its accident year combined ratio soar to 132.6 percent in 2014 from 105.1 percent the year before.

Although like-for-like figures are not available for the company market, it's safe to assume the experience has been comparable as underwriters have absorbed a string of major claims, including the losses of Malaysia Airlines flights MH370 and MH17; the fighting at Libya's Tripoli Airport from July 2014 onwards, which destroyed or severely damaged multiple aircraft; and more recently the tragic loss of Germanwings flight 9525.

Investigations are still ongoing into many of these losses, so it would be remiss to speculate on causation, but it would seem that at this stage no fingers are being pointed at faulty component parts - as they have in other significant aviation disasters in recent years.

Yet for manufacturers, airlines and their insurers, looking at emergent risk management issues is vitally important, and this is true of the crucial issue of supply chain risk for aviation products - especially given the continued increase in air traffic, which puts an ever greater strain on parts. According to the International Air Transport Association, total global air travel demand increased 5.9 percent year-on-year in 2014, while capacity was up 5.6 percent.

Here, there is an interesting coverage dynamic. Aircraft operators enjoy insurance protection on a "per occurrence limits" basis, whereas product manufacturers do not, as they live with aggregate limits on their policies.

This exposure to an accumulation of liability losses is a reality faced by every component part manufacturer, and therefore presents a lack of certainty for the large original equipment manufacturers when considering risk mitigation plans within their own supply chain.

To provide more certainty, American International Group has recently introduced an innovative aerospace product liability policy that provides up to $50mn per occurrence, with no aggregate limit for non-critical aviation component part product manufacturers.

Naturally, securing the right insurance cover is only part of the solution. Within the aviation risk management arena it's important to have an organisation that can be proactive, and this is especially true when it comes to "rotables" - aviation jargon for a component or inventory item that can be repeatedly and economically restored to a fully serviceable condition.

As far as airlines are concerned, a key question that needs to be asked is: what rotables need to be taken out and repaired or replaced?

This is where supply chain issues are crucial, because if the manufacturer providing a particular rotable goes out of business or loses their production capability, that can have a significant impact on the entire supply chain.

It's often the case that a particular rotable - a fuel control unit, say - is itself made up of a myriad of smaller components, so the little guy with a problem can create much greater problems for the entire supply chain.

Working lifespan

The industry also needs to have a keen awareness of the working lifespan of a particular component, commonly referred to as the "mean time between failures".

It's easy to appreciate that maintenance, repair or indeed replacement is a strict cyclical process and one where the aviation market needs to have strong oversight, especially given the sheer volume of products that are involved in a contemporary passenger aircraft.

After all, it's not just about the engine or cockpit instrumentation - it's the whole of the plane from the seats to the galley, as well as the aeronautical data needed for a successful flight.

It's important to be ahead of the game here. As one can appreciate, for the aviation market, the risks are not trivial.

Given the extremely complicated logistics involved in the supply chain process, it should also be stressed that, ultimately, the failure of a component part or parts rests with management. There might be a degree of culpability lower down the chain, but it is up to airline management to ensure that they have a contingency plan in place to ensure they can continue to function in the event of a supply chain issue.

And since some components can look very similar, successful stock control and stock management is a key aspect of the broader supply chain risk management picture.

Emerging aviation risks are not limited to potential supply chain issues. One of the latest topics to surface is that of so-called "aerotoxic syndrome" - where, it is alleged, contaminated air from aircraft systems bleeds into and circulates in the cabin. Over time, this is said to have somehow poisoned the crew as a result toxins relating to oil.

There has been an extensive amount of media-led hyperbole regarding the issue, exemplified by recent headlines such as that in Dutch national newspaper Telegraaf which ran: "'Deadly Nerve Gas found inside aircraft". According to the article, researchers at the Academic Medical Center in Amsterdam have "rock-solid" evidence that the syndrome exists.

On a less hysterical level, in the UK a coroner's report earlier this year into the death of a pilot, sent to the chief operating officer of the Civil Aviation Authority, suggested that "the occupants of aircraft cabins are exposed to organophosphate compounds with consequential damage to their health" and that "impairment to the health of those controlling aircraft may lead to the death of occupants".

The coroner also suggested there is no real-time monitoring to detect failures in cabin air quality and that no account is taken by airlines of "genetic variation in the human species that would render individuals...intolerant of the exposure".

Scientific consensus

Such media coverage can serve to whip up sensationalism and give further ammunition to the global plaintiff bar. But, despite coverage of this sort in relation to aerotoxic syndrome, there is at present an overwhelming scientific consensus that that there is no empirical evidence to support this purported syndrome.

According to a 2008 report by Michael Bagshaw, aviation medicine director at King's College London, there had been no peer-reviewed recorded cases of neurological harm in humans following exposure to tricresyl phosphate - one of the components of engine oils that are said to be a core harmful agent for pilots.

The King's College study alluded to a meta-analysis by the Medical Toxicology Unit at London's Guy's Hospital in 2001, which examined exposures dating back to 1943. The comprehensive study showed that in all cases of exposures, the high concentrations were significantly in excess of the amount present in jet oil.

Another recent expert panel review by Australia's Civil Aviation Safety Authority concluded that there was "insufficient evidence at present to confirm or deny biologically significant exposure to cabin air contamination that would lead to significant absorption by crew or passengers".

As matters stand the scientific evidence certainly does not support the allegations that have been made in the media.

Of course this doesn't mean we can ignore this and other possible emerging aviation risks. Our duty is to support our insureds and brokers, and this we do by keeping a keen watching brief on emerging trends and undertaking analysis of the available evidence.

It should be stressed that this is an industry with a sophisticated approach to risk management, and it is part of our ongoing commitment to clients to help develop this further through both intellectual support and product development.

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This article originally appeared as part of Insider Quarterly's Summer 2015 issue

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