

PIIQ PERSPECTIVE

Space insurance might seem like a fanciful concept to some, but to Piiq's space brokerage team it's a serious business opportunity. It also represents a timely opportunity for clients in the context of a major broker consolidation that will reduce competition in this highly specialised market. And while Piiq might be a new brand, its dedicated 'core team' has well over 100 years of combined space insurance experience.

In fact, space insurance has a long history, with the first policy for a communications satellite written as long ago as 1965. Although it covered only third-party liability and pre-launch risks - reflecting insurers' limited experience with the technology - it marked the beginning of a new strand in risk management services.

INSURING SATELLITES

Today, most commercial satellites are covered for launch and in-orbit lifetime, which is typically up to 15 years for a 'comsat' based in geostationary orbit (GEO). GEO is an equatorial orbit that matches a satellite's orbital speed to the rotation of the planet, so the satellite appears stationary from the ground (which means you can bolt a satellite TV dish to your house and forget it).

Unsurprisingly, the launch phase represents a relatively high level of risk exposure and attracts the highest rates. However, the in-orbit phase has its own risks, not least the possibility of equipment failure – which is why space hardware is designed, manufactured and tested to the highest standards. There is nothing else we build and expect to work, in

Space: A new Frontier for Piiq?

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such a stressful thermal and radiation environment, for 15 years without maintenance.



Fig 1 – in-orbit satellite refueling mission - NASA

When that first space insurance policy was written in 1965, there were no space brokers, no space insurers and precious little space industry, so the policy was placed with the existing aviation insurance community. By the 1980s, however, dedicated space teams had been created by the main insurance brokers to address the degree of technical expertise required.

While coverage for comsats is still the mainstay of the business, the past five decades have seen a degree of diversification. Most notable are policies covering imaging satellites, which operate from lower orbits and provide the type of imagery seen in Google Maps, among many other applications. The key difference for insurers is that, instead of covering the transponders that provide bandwidth for communications services, policies are concerned with image-quality metrics and the ability to acquire and deliver the required imagery in a timely manner.

BESPOKE SOLUTION

Ultimately, however, it's not really about the technology, challenging and fascinating though it is; it is about the client - and constructive dialogue is key. As with any other aspect of insurance, matching the client's needs to the market's capabilities is part of the broker's role. This requires in-depth discussions with a client's engineers and commercial managers about intended use and level of performance expected, as well as other aspects that make the difference between profit and loss.

Of course, how well a policy performs in the event of a claim is down to the design of the loss formula, which is where client and broker must work closely together. Regrettably, some brokers hide behind the loss formula by making it dense and overcomplicated – a counterproductive philosophy in the event of a claim - often failing to realise that it's the client's loss formula, not the insurers'.

Satellites are often unique creations, so good policy design requires a high degree of empathy with the client. Space insurance is not about imposing a cookie-cutter prescription; it's about providing a bespoke solution.

NEWSPACE

In the past decade or so, the space industry has experienced a remarkable paradigm shift away from the dominance of large commercial companies and government backed space projects towards smaller start-ups and private venture capital.

One of the most recent technological advancements is rocket-stage reusability. Because they were typically used once and effectively 'thrown away', rockets were termed expendable launch vehicles. Today, it is becoming increasingly common to fly a

rocket's first stage back to the ground, return it to the factory for refurbishment and reuse it for subsequent missions. A similar concept of reusability can be found with the capsules used to deliver cargo and crew to the International Space Station.



Fig 2 – reusable rocket stages land in Florida - SpaceX

Elsewhere in the industry, various companies are pioneering the field of in-orbit satellite servicing, which challenges the 60-year paradigm that satellites, once launched, are out of reach. The technology is being developed to extend a geostationary satellite's in-orbit lifetime beyond the typical 15 years, relocate it to a new orbital position or retire it to a so-called 'graveyard orbit'.

A key question for insurers with new technology is always "how do we know a new company can deliver reliable hardware that will work in space?". The answers often lie with the proven heritage of similar systems and technologies, and this is where the broker can help to instill confidence in insurers, through discussion and presentations from the client.

Of course, satellite technology would still be chained to the 1960s if insurers were unwilling to take risks. Luckily, some innovative underwriters are willing to support the developing space market and accept a degree of managed risk to help prove a new area that promises to provide additional premium income.

THE PIIQ PERSPECTIVE

Piiq's own perspective on the space insurance market is one of pragmatism informed by experience. For the foreseeable future, the majority of premium income will continue to be derived from the larger communications and imaging satellites operated by established players in their respective industry segments. However, our industry is based on risk and would never move forward without looking forward.

As reusable rockets, 3D-printed engines, software-defined satellites and commercial space station supply missions become the norm, the industry is looking beyond the status quo. Indeed, only the most conservative practitioner would rule out insuring a lunar exploration or asteroid mining mission sometime in the not-too-distant future.



Fig 3 – artist's impression of Ariane 6 Launch - ESA

Piiq's space team has significant experience designing and placing cover for established operators of communications and imaging satellites, and also for innovative applications such as in-orbit servicing and debris removal. We are a young company, with an established team of experts offering stability at a time of significant market upheaval and stand ready to provide our expertise wherever required.

AUTHORS



RUSSELL SAWYER SENIOR PARTNER

Russell is a Senior Partner in Piiq's space team and has some 30 years' experience in producing and negotiating policy coverage and loss formulae for space clients across both

satellite operators and manufacturers. He worked closely on issues regarding the first commercial in-orbit servicing mission and has managed relationships with both satellite operating and manufacturing clients in the UK and Asia.



MARK WILLIAMSON SPACE CONSULTANT

Mark is Piiq's in-house engineering advisor and provides a range of technical consultancy services. His 40-year career in satellite engineering and

space technology supplements the team's expertise not only with regard to engineering developments, but also with important space risk issues such as orbital debris, space weather and related mitigation measures. Mark has worked closely with policy expert Russell Sawyer for more than 20 years to ensure that policies fully reflect the engineering design of the satellite and its intended use.

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