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Risk Management

Research on Risk Management, Assessment and Prevention

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15th International Space Insurance Conference, 2-3 April 2009, Venice

organised by Pagnanelli Risk Solutions (PRS, spaceconference@pagnanellirs.com), London, on the subject of

“Space Activities and Relevant Insurance Implications”

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“The world economic and legal environment is dramatically changing: how does this impact on risk management and insurance solutions for Space?” was the theme of the Conference. Speakers representing the major space agencies, manufacturers, operators, insurance underwriters and brokers, discussed the evolution in financial, legal, scientific and risk management issues.

Benito Pagnanelli, convenor and President of Pagnanelli Risks Solution, pointed out in his opening speech that the global credit crisis has hardly touched the space sector, its companies are on average still sufficiently solid, and that space is not just the venture it was 50 years ago, but has become a growing business with a growing number of players and applications oriented at economic and public services. Pagnanelli also drew attention to the legal implications of space debris and collision in space and to increasing litigation in space insurance. He urged for greatest transparency and trust between the parties when formulating a policy wording or responding to a claim.

Christopher Kunstadter¹ analysed the market trend which is softening, while launch rates have continued to increase. The volatility of the underwriting results mainly stems from the constant changes in technology, the serial nature of anomalies, the fact that each space risk has unique technical characteristics and the inherent risks including the space debris problem. The peak of the risk still lies in the launch and deployment phase, but decreases remarkably after the first year in the space.

The Galileo project panel was moderated by Benito Pagnanelli

Paul Flament² presented the state of the current Galileo project. Plans to set up a public-private partnership have been dropped due both to risk management and financial concerns of the private sector. The Galileo programme has now a €3.4 billion budget and an 80-people-strong management; the programme is due to be fully deployed by 2013. An invitation to tender for project management and market development, launched under EU rules in 2008, attracted 21 offers. Efficient coordination with similar systems will be important to avoid redundancy with the U.S. GPS network, which is cheaper and has a track record, and the European Geostationary Navigation Overlay Service (EGNOS), a satellite system composed of three geostationary satellites, a ground network of 40 positioning stations and four mission control centres that is supplementing Galileo. EGNOS should improve the accuracy of the current GPS services from 10 to 2 meters and will provide information about the integrity of the GPS system. EGNOS, tailored for the aviation sector, will facilitate the use of airports; on 31 March 2009, its operative control passed from the European Space Agency (ESA) to the European Commission.

¹ Vice President of XL Insurance.

² Deputy Head of the EU Satellite Navigation Programmes Unit at the European Commission.

Ms Anna Masutti³ spoke about the draft regulation on third party liability for Galileo and EGNOS, drawn up by the Italian Government to facilitate geo-navigation systems in Europe. This comprises the channelling of liability to one party; a strict liability regime coupled with a limitation of liability and a two tiers compensation regime, with compulsory insurance up to the limit of the first tier and direct recourse against the insurer. Inspired by air carriers' liability conventions, this eases the burden of proof on the claimant. The second tier of compensation will be made available with public funds by Member States and is aimed both to increase the amount of compensation available to the victims and to share the financial risk between private industry and public parties, establishing a private-public partnership for liability.

The panel on risk and finance managers was moderated by Ramin Khadem

Philippe Cotelle⁴ pointed out the importance of risk management as capital market providers demand private companies to assess and mitigate the potential exposure systematically. Cotelle stressed that the current financial crisis is also a crisis of ethics, that moral hazard is part of risk management. He emphasised that space offers fantastic tools to monitor issues such as diagnosis, disaster prevention, loss recovery, pollution detection, mitigation and even carbon trading.

Maureen Offord⁵ illustrated her company's approach to risk management based on insurance procurements to mitigate risks and on risk prevention, both internally (in an effort to implement the most reliable technical procedures) and externally (by a selection of vendors and contractors with an approved track of success).

The legal panel was moderated by Nicholas Hughes

Ms Farah Suhanah Ahmad Sarji⁶ presented her company's insurance strategy, highlighting the importance of the brokers' role, long-term contracts and sound business credibility.

David Bensoussan⁷ used the recent first-ever accidental collision of two satellites in low earth orbit to promote a more regulated approach instead of the traditional freedom of action in space. Since 1991, there have been eight collisions in low Earth orbit between satellites and space debris. Although the recent collision appears to fall within the scope of the International Liability Convention for damages caused by space objects (1972), the Convention has never been tested and space law does not provide for a comprehensive traffic management regime. From an insurance perspective, few operators are covered for third party liability arising from operations in orbit and, as such coverage has never been tested, there are many uncertainties with regards to occurrence, duration of cover and subrogation.

Ms Pamela Meredith⁸ focused on salvage rights under the draft Space Protocol to the Cape Town Convention. The draft Protocol places insurers' salvage rights in jeopardy, as they do not meet the requirements to qualify as "international interests" and can be wiped off by a subsequent sale, the buyer of a satellite under a registered sale acquiring its interest in the asset free from unregistered (although known) interest. A group of eight space insurers have submitted a paper to UNIDROIT proposing that salvage rights be recognised as a separate registerable category.

John A. Ordway⁹ reported about the new management at U.S. State Department's Directorate of Defence Trade Controls and the faster processing of requests for authorizations under the International Traffic in Arms Regulation, which have now to be completed in 60 days of submission, whereas two years ago it took on average 6-8 months.

Rudolph Vic Pino Jr.¹⁰ underscored how arbitration clauses are often recycled from one contract to another without checking whether they are adapted to the needs of the parties, with particular regard to arbitrators' empanelment, discovery, third parties and foreclosure. Arbitration, contrary to what is commonly thought, is not a "one size fits all" solution and it may be advisable to provide for different procedures for different kind of disputes.

³ Professor of Navigation Law at the University of Bologna.

⁴ Head of EADS Astrium Insurance and Risk Management.

⁵ VP of Finance at SES Americom.

⁶ General Counsel at Measat Satellite Systems.

⁷ Underwriter of space risks for Hiscox.

⁸ Co-Chair of the Space Law Practice Group at Zuckert Scout & Rasenberger.

⁹ Partner at Berliner, Corcoran & Rowel LLP.

¹⁰ Founding partner of Pino & Associates.

The finance panel was moderated by Peter D. Nesgos

Willy Chow¹¹ put at the top of his wish list a softer approach by insurers to deductibles, which he feels are too high. Hank Courson¹² urged the industry to be more aware of the lenders' needs, while Nick Flitterman¹³ stressed how lenders rely on cash flow generated from the asset itself and long term revenues are critical to repay the loan in project finance. Charles Sweeney¹⁴ talked about his experience as a new entrepreneur in the space arena and his success in attracting venture capital from private equity funds and hedge funds, a highly leveraged business. He invited insurers to be more proactive in offering insurance for delay, business interruption and contingency, while a deferred basis for premiums payment would also be valuable help for new space operators.

The space agencies panel was moderated by Ms Janet E. Sadler

David Greves¹⁵ underlined the difficulties in governance faced by ESA in a expanding EU, and the fact that space is a strategic asset essential for the security and prosperity of the European Union. He agreed that space debris is a topic and that the lack of clarity in third party liability destroyed the attractiveness of the Galileo private-public partnership for private investors. The full range of ESA activities under the Galileo project still has to be decided but will include monitoring environmental and climate change.

Hiroko Mukai¹⁶ touched on Japanese space law and insurance requirements. Insurance is compulsory and the minimum amount of insurance is decided by the Minister of Defence on the basis of the type of space craft. Average compulsory insurance is in the region of US\$200 million.

Jason Steptoe¹⁷ expanded on NASA's space exploration programme. After the Shuttle will have retired in 2010 and the International Space Station in 2016, NASA hopes to take advantage of commercial lunar ventures and the opportunities they offer in communications, resupply, robotic science and resource extraction. He also outlined the features of some insurance coverage taken out by NASA (in some cases, like the shuttle, some contractors receive "first dollar" indemnification), the NASA Launch Services Program and described the indemnification of users of NASA space vehicles.

The satellite operators' panel was moderated by Christopher Kunstadter

Robert Briskman¹⁸ said that his Sirius XM Radio's risk reduction policy is based on diversification, system redundancy and good in-orbit management. Richard Denny¹⁹ stressed the importance of reducing space debris. While the maritime community has addressed the need of mitigating collision risks a long time ago, the increasing number of in-orbit objects has only just started a focus on the subject of satellite collisions. Denny reminded the audience of the Incidents at Sea Agreement between the U.S. and Soviet Navies in 1972 (similar agreements have been subsequently adopted by more than 30 navies around the world). Jean-Claude Tucoulat²⁰ reported on Eutelsat's reliance on space and credit insurance and the company's policy to have an aggregate deductible in place. According to William Wade²¹ commercial and technical groups as well as engineering and operations are separated by "Chinese walls" in Asia Satellite Telecommunications, to improve the quality and efficacy of internal control procedures. The company works closely with manufacturers and prefers long term supply agreements to haggling over financial discounts; Wade did complain about exclusions.

The brokers' panel was chaired by Stephen J. Riley²²

Riley forecasted a 2-3 year period before the effects of the financial crisis are perceived by the operators, due to the long time to market of the space industry. Riley considered the outlook for the space industry as generally good, while the insurance side now enjoys the effects of the natural time lag between spike in losses and increase in premiums after several bad years.

¹¹ Chief Financial Officer of Asia Broadcast Satellite.

¹² VP and Treasurer at Intelsat.

¹³ Director, Head of Telecoms, Portland Advisers.

¹⁴ Executive VP at Protostar Satellite Systems.

¹⁵ Chairman of the European Aerospace working group on Cost Engineering at ESA.

¹⁶ Manager of the Contract Management Division of Jaxa.

¹⁷ NASA Associate General Counsel for International Law.

¹⁸ Co-founder and Technical Executive.

¹⁹ Senior Vice President at Inmarsat Global Ltd.

²⁰ Head of Contracts & Satellite Insurance at Eutelsat S.A.

²¹ Deputy Chief Executive Officer.

²² Chairman of the International Underwriting Association.

In Jeffrey Polisenos's²³ perception, the space insurance market is in good shape. 2008 was a very profitable year for space insurers (gross premiums of US\$930 million contrast with estimated claims of less than US\$320 million) and offers competitive rates for attractive risks. Although insurance is the third largest expense in a satellite project, at current rates the market remains sustainable. Polisenos shared the view of other speakers that more differentiation and creativity would be welcome in insurance policies, especially in terms of longer policy terms, extended coverage and premium financing. Similar concepts were expressed by Philippe Montpert.²⁴ Although the space insurance market is extremely volatile, it has been profitable for seven out of eight of the last years. He expects that broadcast and telecommunications services will continue to grow in the near future. The outlook for the satellite business remains also good for Neil Stevens²⁵ with effects of the financial turmoil unlikely for at least two to three years, thanks to the long lead times of this industry. Low losses of 2008 and the increased capacity of the insurance market are expected to enhance competition and may lead to lower premium rates.

Ms Ma Qimin²⁶ offered a review of the development of China's space history, which began in 1970 with the launch of the DFH-1 satellite by LM-1. While PICC was the only insurance company in China before the early 1990s, the space insurance market has greatly developed and today there are 19 companies involved in space insurance, offering an underwriting capacity in excess of US\$200 million for each project for launch, in-orbit and third party liability.

For Jan Schmidt,²⁷ the financial turmoil has caused severe losses on the asset side, but insurers and reinsurers are probably sufficiently capitalized to go through the crisis. There may be, however, less capacity in the future, due to insurers' need to compensate their difficulties in investments, other lines of business being more profitable, which may bring premium rates up.

Ms Shu Lu²⁸ reported on PICC's leading role and track record in the Chinese market, Jeffrey Cassidy²⁹ illustrated the experience of Global Aerospace in the space insurance arena and stressed the importance of choosing reliable insurance providers who will be there in five or more years to pay claims, space insurance being a long tail business.

David Wade³⁰ provided the audience with an interesting insight in a different aspect of risk management for the space industry: as the baby-boomer generation reaches retirement age, there are growing worries for a decline in the specialised workforce. While Chinese and Indian Universities supply their countries with an increasing number of engineers and scientists, insufficient personnel are available in the short term to fill the skills gap in the U.S. Training, on the other hand, is expensive and training budgets may come under pressure due to the current economic environment. Wade also expressed the view that the high volatility of space insurance hampers the demand for more creativity invoked by other speakers.

The manufacturers' panel was moderated by Ms Stacy Shapiro

Barry Noakes³¹ is seeing signs of a slow-down in the market, primarily with the entrepreneurial operators, who are delaying some of their procurements. Lockheed Martin, however, is continuing to invest in their cornerstone products and in the seventh generation of LM GEO communication satellites.

Other speakers in the panel were Toru Yunoki³² and Ms Megan Fitzgerald³³ who both reported on their companies' activities and track record. David Keslow³⁴ forecasted a delay in new projects for GEO satellites due to a lack of financing, which operators are likely to try to overcome by increasing their fleet utilisation and postponing fleet replacement and expansions plans. In his presentation, Keslow also

²³ Chief Executive Officer at International Space Brokers (a division of AON).

²⁴ Managing Director at Willis.

²⁵ Vice President at Marsh in London.

²⁶ Assistant President & General Manager of the Space Risk Department at Jiangtai Insurance Broker.

²⁷ Director and Head of Insurance and Reinsurance Space Department at Swiss Re.

²⁸ Head of Aviation & Space Insurance Division at PICC.

²⁹ Chief Operating Officer at Global Aerospace.

³⁰ Space Underwriter at Atrium.

³¹ Chief Engineer at Lockheed Martin.

³² Deputy General Manager in the Commercial Space Programs Department at Mitsubishi Electric.

³³ Executive Director at Space Systems/Loral.

³⁴ Director, Business Operations for Orbital Sciences Corporation.

reported on the developments of some large subrogation cases brought forward by insurers against satellite manufacturers, such as Thuraya, Anik F1 and Superbird 6.

The launch providers' panel gathered Ms Shoichiro Asada,³⁵ Kjell Karlsen, President and General Manager at Sea Launch, Jean-Yves Le Gall,³⁶ Philip Slack, VP and C.F.O. at ILS and He Xing.³⁷

Launch providers agreed that the financial crisis has no near impact and that deferment in projects by some operators may not be expected before 2010. Launch operators' agenda remains therefore fully booked for the near future. While large operators have the flexibility to self-insure, lenders do require insurance.

The space tourism panel was moderated by Sean Gates³⁸

Messrs Cotelle, Greves, Steptoe and Ms Sadler discussed the issue of insurance for space tourism. Sadler reminded the audience that insurance thrives on volume and rests on the principle that the misfortune of the few is supported by the many. Space tourism is dedicated to an extremely wealthy group of clients. Operators therefore face very high exposure in a niche market, which has inevitable consequences on premium rates and exclusions. Space tourism vehicles serve on a number of trips and their components are reusable; a challenge for insurers will be to distinguish between natural wear and tear and accidents. Greves added that space tourism lacks sympathy by the general public as it appears as a costly entertainment for very rich people and poses environmental concerns, while Steptoe reminded that the US Federal Aviation Administration (FAA) indemnification regime does not apply to sub-orbital flights.

The panel on new technologies and space exploration was moderated by Walter Stahel

Stahel underlined the importance of getting the public enthusiasm back into space activities. Quoting Antoine de Saint-Exupéry (Citadelle, 1948): "if you want to build a ship, don't round up men, gather tools, divide the work and assign tasks, but teach them the desire for the wide endless sea", he insisted that space is an inspirational activity that has the appeal to attract young people to science and engineering. Tim Hughes³⁹ outlined SpaceX' progress in the last five years. SpaceX builds all the main rockets' components internally to keep costs down and avoid delays, as well as clustering and testing their engines internally. He illustrated SpaceX activity for NASA under the Commercial Orbital Transportation Services and the Commercial Resupply Services Programs, aimed at the delivery of cargo and crew to lower earth orbit and to the International Space Station by private operators. Both the programmes are FAA licensed and require third party liability insurance for launch and re-entry and insurance for payloads and vehicles. Finally Mr. Ramin Khadem reported about Odyssey Moon Ventures' projects to be the first private space mission to the moon.

The presentations will be published in the *Etudes & Dossiers* series of The Geneva Association in summer 2009. For more information, visit http://www.genevaassociation.org/Publications/Working_papers_series.aspx

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³⁶ Chairman and C.E.O. at Ariospace.

³⁷ Vice President at China Great Wall.

³⁸ Senior Partner at Gates and Partners.

³⁹ Vice President and Chief Counsel at SpaceX.