

Space Insurance Notes

by

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1 | Insurance Coverage

There are generally four types of space insurance in which are covered risks to the rocket, the satellite and related equipment, and third-party liability. Factors that influence the policies that are written are market conditions, type of rocket, orbital deployment and satellite attributes. The scope and design of the coverage have kept pace with the development of technology, the demands of policyholders and the constantly improving expertise of insurers. Although all underwriters use similar terms and conditions, policies for commercial satellites are individually made up based on the satellite and the launch vehicle which will put it into orbit. Terms and conditions s.a. premium rates and period of coverage are negotiated between the client and the underwriters. The risks and associated coverage are described below.

The risk of material damage is covered by all-risks policies whose scope goes far beyond what is customary in normal property insurance. Apart from the usual war, terrorist acts and atomic energy exclusions, there are virtually no exclusions what so ever. Insurers grant the broadest coverage imaginable. This is mainly due to the 'one-way-mission' of launching a satellite. It is generally impossible to rectify malfunctions once a satellite is in orbit and it is for these malfunctions that insurance is required. Without the extensive scope of cover the insurance protection would be of very limited value. Space risks can be projected on a time-line and are related to a sequence of events. Material damage insurance therefore is divided in pre-launch insurance, launch insurance and in-orbit insurance. There are some more risks that can be separately insured s.a. assembly of satellite and launch vehicle, functional testing on the launch pad of the launch vehicle and satellite, testing of individual components and procedures etc. These risks are usually (re)insured outside the space insurance mar-

ket. Furthermore there is a mandatory third-party liability insurance.

2 | Pre-launch Insurance

Pre-launch insurance provides all-risks coverage for material damage to the launch vehicle and / or the satellite during the period of time between the departure from the integration facility and the intentional ignition of the first stage of the launch vehicle. It may also cover termination fees, launch delay penalty fees, lost revenues and other consequential or incidental damages that can be attributed to a physical occurrence. The party that bears the risk of loss purchases this cover. Before the satellite leaves the factory it falls under normal entrepreneur's risks and can be insured (or not) accordingly. The transportation from the factory to the launch site is often covered under a marine policy. The pre-launch insurance starts mostly when the satellite arrives at the launch site. There it is transformed into its launch configuration (taken out of protective packaging, assembling) and integrated with the launch vehicle while all the preparations for the launch are being made (fuelling, arming, etc.). The coverage generally ends when the ownership passes from the manufacturer to the purchaser. This point in time is at the latest when the launch can no longer be aborted. This transfer of title is contained in the satellite procurement contract and precisely described in the policy and varies per launch vehicle (e.g. intentional ignition, launch, retaining clamps released, lift-off, etc.). Pre-launch insurance is available for the launch vehicle also. If both the launch vehicle and the satellite have pre-launch insurance, the moment they are integrated, the insurances start to accumulate with each other. If the launch is aborted after the pre-launch cover has terminated, mostly a so called reattach coverage applies (post-abort coverage).

It can be argued that pre-launch insurance should be an engineering insurance in stead of space insurance. However, there are some very particular risks in pre-launch insurance which can only be assessed using the kind of comprehensive specialized knowledge that is almost only available in the space insurance market.

3 | Launch Insurance

The launch risk phase starts at lift-off (or alternatively when the first stage engines are intentionally ignited, in which case an aborted launch is also covered) and ends when the satellites are totally separated from the launch vehicle and in-orbit testing has been completed. Nowadays a longer period of cover, usually up to 365 days after launch, is often possible. The holder of a launch insurance policy is generally the satellite operator. If the satellite operator chooses the option of in-orbit delivery of a turn-key satellite, the manufacturer carries the launch risks and will be the policy holder.

A total loss of the satellite is declared when the satellite is physically destroyed or cannot fulfil its planned operations because it failed to attain its intended orbit. The amount of compensation payable in the event of a total loss is specified in advance. It usually covers the cost of a new satellite, the costs of launching it and the cost of the launch insurance.

A partial loss is assumed when the satellite can only partially fulfil its planned operations or when its operational life is shortened. The sum insured will be paid out only in ratio to the decrease in value, depending on the scale of the impairment. The policy will contain formulae to calculate various mal-functions and the resulting decreases in value. Reasons for a decreasing value could be a reduction in fuel supply because of excessive fuel consumption in the positioning phase, an insufficient power supply, transponder failures etc. However, a decrease in value is only granted if the satellite's operational capacity is assuredly impaired. If the impairment caused by a partial loss exceeds a certain limit specified in the policy, a "constructive total loss" is assumed. In general, to be declared a constructive total loss, the im-

pairment of the satellite must be so severe that it does not meet the insured's operating requirements and has to be replaced.

Launch insurance is the most expensive type of coverage and it is not uncommon for launch service providers to offer a 'launch risk guarantee' as an alternative to launch insurance. This may also be provided as a supplement to the traditional launch insurance policy. These guarantees are designed to cover the expense of a replacement launch service and usually take the form of a cash payment or an option of a repeat launch free of charge. Since these guarantees usually cover only part of the launch risk, in both financial and technical terms, the operator will require supplementary launch insurance for the remaining portion of the risks. The danger exists that there are gaps in the coverage which could and probably will jeopardize the claims for compensation.

4 | In-orbit Insurance

In-orbit commissioning insurance. Once the satellite is separated from the launch vehicle, it often has to autonomously manoeuvre in-orbit so as to reach its final orbit. Within typically no more than six months (time period allowing for one of the two yearly eclipse seasons in geostationary orbit), the satellite is fully deployed and all its systems are tested. In-orbit commissioning insurance covers failures or damage caused to the satellite during such period.

In-orbit insurance covers all risks of partial or total loss of a satellite while it is functional in its commercial life period. Such cover may begin as soon as in-orbit commissioning is confirmed. The insured value is an agreed value, based on replacement value at the beginning of the service life of the satellite. The sum insured covers the total cost of manufacturing and launching a replacement satellite, but is reduced over time to avoid over-insurance. Total loss, partial loss and constructive total loss are the same as in the launch insurance and the same formulae are used. Insurers will benefit from any salvage value that the satellite may have or revenues derived from the damaged satellite. Usually in-orbit insurance policies are written for twelve month at a time and could be renewed

depending on the technical condition of the satellite, or completely rewritten if the satellite's condition or its performance warrants this. After the satellite has performed for some time and there is confidence that the equipment will be working for the duration of the commercial life period, the in-orbit insurance might be stopped or the operator turns to self insurance or under insurance.

Coverage of incentive schemes. The manufacturer and its client usually agree that the price of a satellite splits into a fixed part and a variable part which will depend on the satellite's functions, performance and service life. The variable part, often called satellite performance incentive scheme, may be insured by the manufacturer with the satellite operator's agreement. Coverage of these risks, which is like insuring performance guarantees, is problematic because it is difficult to distinguish it from the general business risks, which are uninsurable.

Transponder insurance. This insurance provides protection against the loss of one or more (communication) transponders. This type of insurance is bought by operators that do not own a satellite (system) but purchase, lease or rent (spare capacity) satellite transponders or on an existing satellite that is operated specifically for that purpose. There is quite a market for this type of transponders. Insurance of this type needs assessments of the condition of the satellite and the question of service protection which relates to whether and under what conditions the policy holder is entitled to a replacement transponder.

5 | Loss of Revenue Insurance

Coverage of loss of revenue generated by a satellite, operates on an indemnity basis and is due following the partial or total failure of the insured commercial payload. The financial loss caused by the failure may be far greater than the material damage itself if the reduced serviceability results in a loss of revenue. There is no standard form of cover for these insurances, but in general indemnification only takes place when it can be proven that the revenue really would have been earned if the failure had not taken place.

6 | Third-Party Liability Insurance

Third-party losses caused by the launching and operating of launch vehicles and satellites constitute special risks that are excluded from the scope of cover granted under general liability insurance policies and therefore a special form of liability insurance for satellites have been developed. The purpose of this insurance is to cover all third-party legal liability claims arising from damage caused by a satellite, its launch vehicle, or any part thereof, regardless of the party against whom such claims were made. The policy includes as co-insured all those parties that might conceivably be liable, in particular the manufacturer, the operator, the Launching State, and all organisations rendering services in the launch and operating phases. The cover becomes effective with the scheduled ignition of the launch vehicle and ceases when the policy expires or if the satellite and its launch vehicle are completely destroyed. Damage to the launch facilities is not covered. Damage to the payload(s) is not covered either since the underlying contracts usually contain a cross-waver of liability by all parties.

For states that have ratified "The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 1967" and/or "The Convention on the International Liability for Damage Caused by Space Objects, 1972", third-party liability insurance is usually a requirement pursuant to the grant of license for a space launch.