

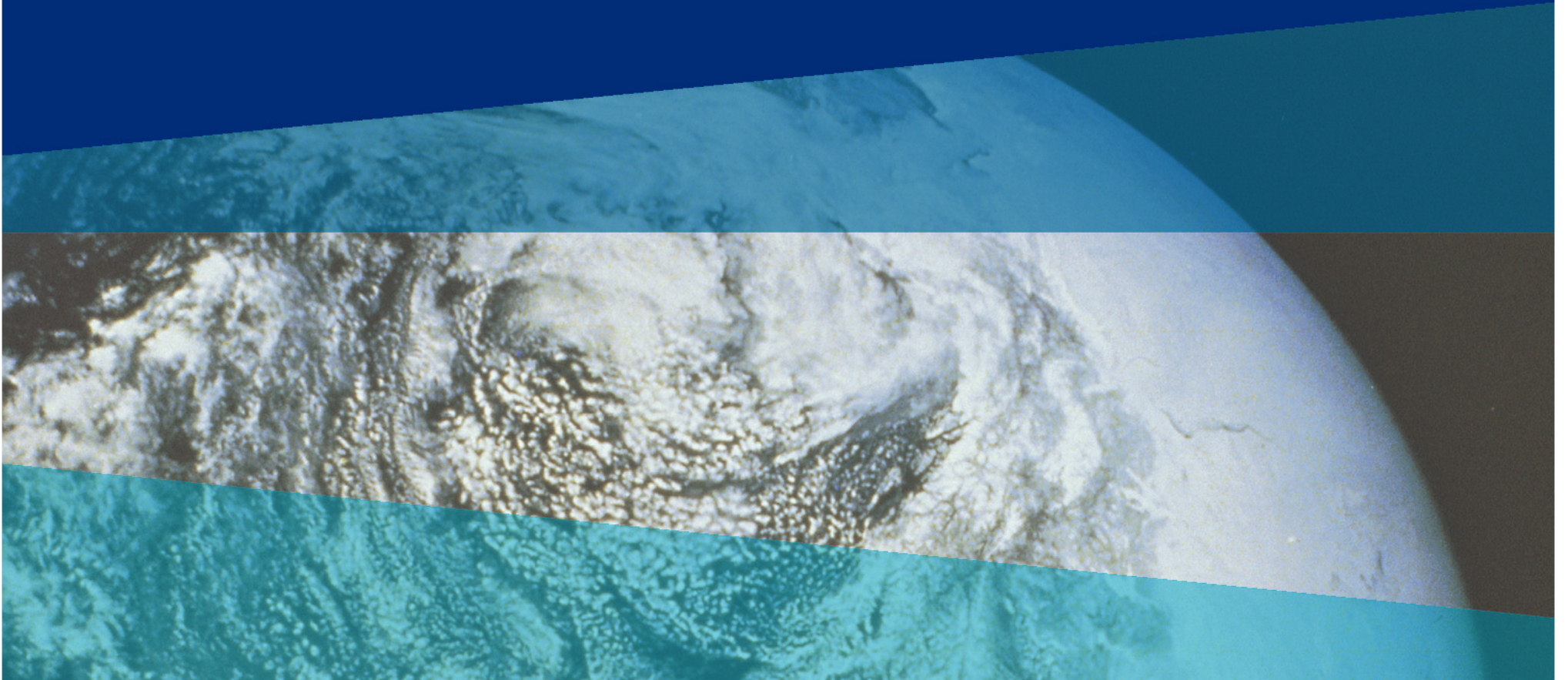
Can space insurance offer workable solutions for outer space sustainability

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Summary



Summary

- **Typology of Space Insurances**
 - Property insurances
 - Liability insurances

- **Space Property and Liability Insurance market**

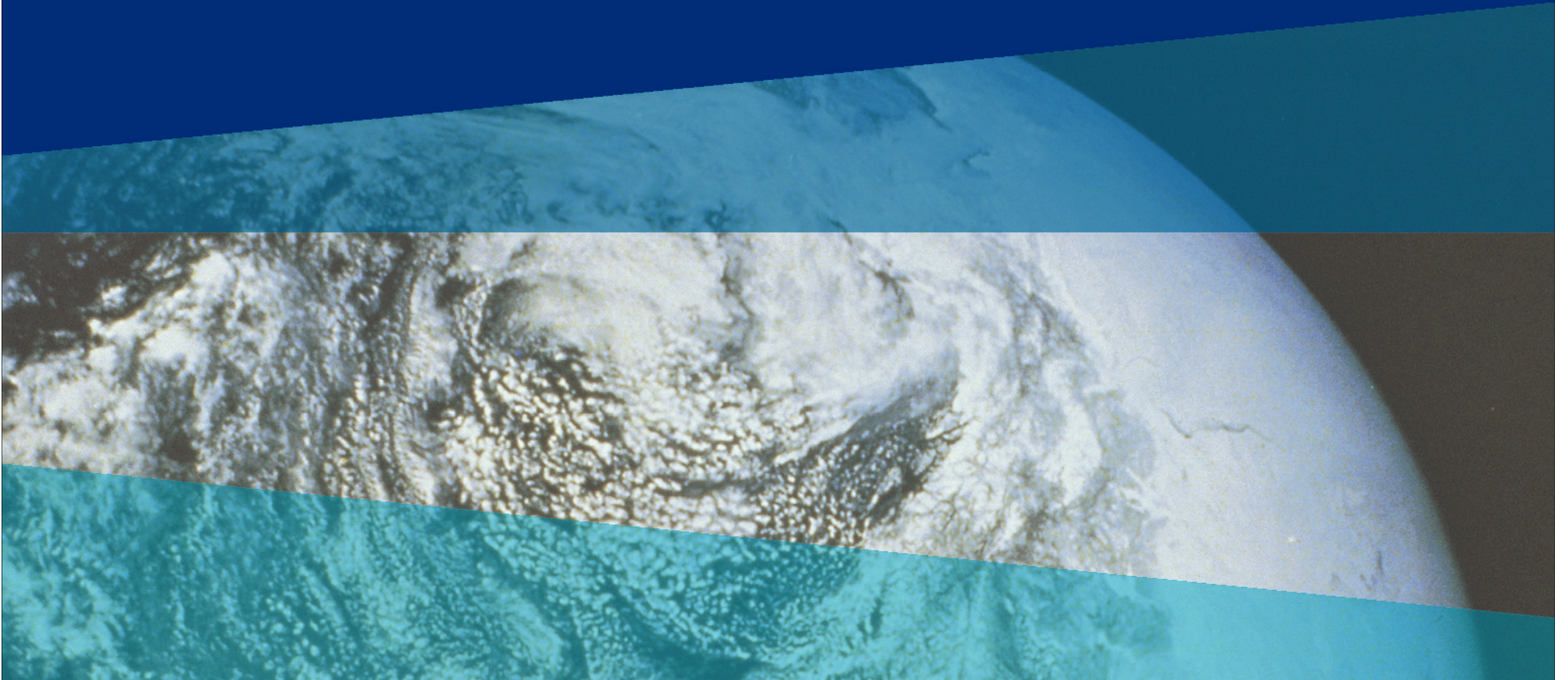
- **Insurance solutions with respect to space sustainability**

Multiplicity of actors and risks

- Launch operators
- Satellites operators
- Manufacturers
- Sub-contractors
- Ground services providers
- Carriers



Typology of Space Insurances



Available Space insurances

- **Before launch:**
 - « Pre-launch », property damage insurance while the spacecraft (satellite/launcher) is on ground during AIT, transportation, at the launch site
 - Liability insurances for activities on ground
- **During launch and after launch:**
 - Property damages insurance for satellites
 - Liability insurances for activities in-orbit



Space Property Damage Insurance

- Object: indemnifying the insured or loss payee in case of loss or damage to the insured satellite
- Depending on the type of damage: Total Loss, Constructive Total Loss or Partial Loss, the insurers will indemnify the declared value of the satellite or the value corresponding to the damaged part of the satellite
- Traditionally these insurances are on an “all risks” basis
- Generally 12 months cover

Space Liability Insurances - Legal Environment

International Space Treaties:

- **1967** Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies
- **1972** Convention on the International Liability for Damage Caused by Space Objects

National Space Laws:

- Authorisation process
- Liability regime
- TPL Insurance requirements
- Examples of national laws

US Commercial Space Launch Act (1984) amended 1988, 2000, 2004, 2008

Great Britain Outer Space Act (1986)

French Law Relative to Space Operations loi n° 2008-518
3rd june 2008 (LSO)

Contractual practices

- In order to mitigate the liability of any participants, it is possible to add in the contracts limits of liability, or allocation of liability between the parties.
- Said limits of liability, as a consequence, limit as well the TPL insurers exposure and the loss record of the insured
- These limits/exception of liability are either required by law or are the consequence of the contract negotiation

Standard practices of the space industry

- **Launch activities**

- In Launch Services Contracts, standard “**reciprocal no fault, no subrogation, inter party waivers of liability**“ between participants.
- Use of reciprocal waiver of recourse completed with a « flow down » obligation
- Effect: applicable for the launch chain and satellite chain in relation to the execution of the launch services agreement

- **Satellite activities**

- From time to time, for this contractual chain, the rights of recourse may be preserved between the participants to this contractual chain, subject to application of the national law
- The space insurance policies covering damages caused to satellites (launching or in-orbit phase) traditionally include a waiver of subrogation rights from the insurer in favour of the participants to the satellite contractual chain, to the extent that the insured has waived its own rights of recourse in writing BEFORE inception of the policy

Before Launch: Liability Insurance

On ground, general TPL insurance covering the liability of the operator during execution of its activities and implicating its employees and properties/premises for damages caused to:

- satellite(s)
- other operator (property or employees)
- third parties

For execution of launch services, coverage ends when the space liability insurance starts

Launch Liability Insurance

- Cross Waivers and Hold Harmless between parties
- Single TPL policy covering all contractors at every tier
- Cover launch activities
 - Begin and end of covered launch activity varies
 - Duration of coverage varies
- Main exclusions

Spacecraft Operation In Orbit Liability Insurance

- Several Nations require licensed or registered operators to provide in orbit third party liability insurance
 - Limits and scope vary

Great Britain	Euro 60M
Japan	US\$ 100M
France	Euro 60M
Hong Kong / Singapore	US\$ 100M
- Generally operators only buy if required by regulation or contract

Satellite Property Damage Liability (TT&C)

- Satellite Manufacturer or Third Party TT&C provider
- Liability for damage to a satellite caused by an occurrence
 - Satellite is the property of others
 - Satellite is in the care, custody or control of operator
 - Coverage limited to \$500 Million any one satellite

Space products liability extension

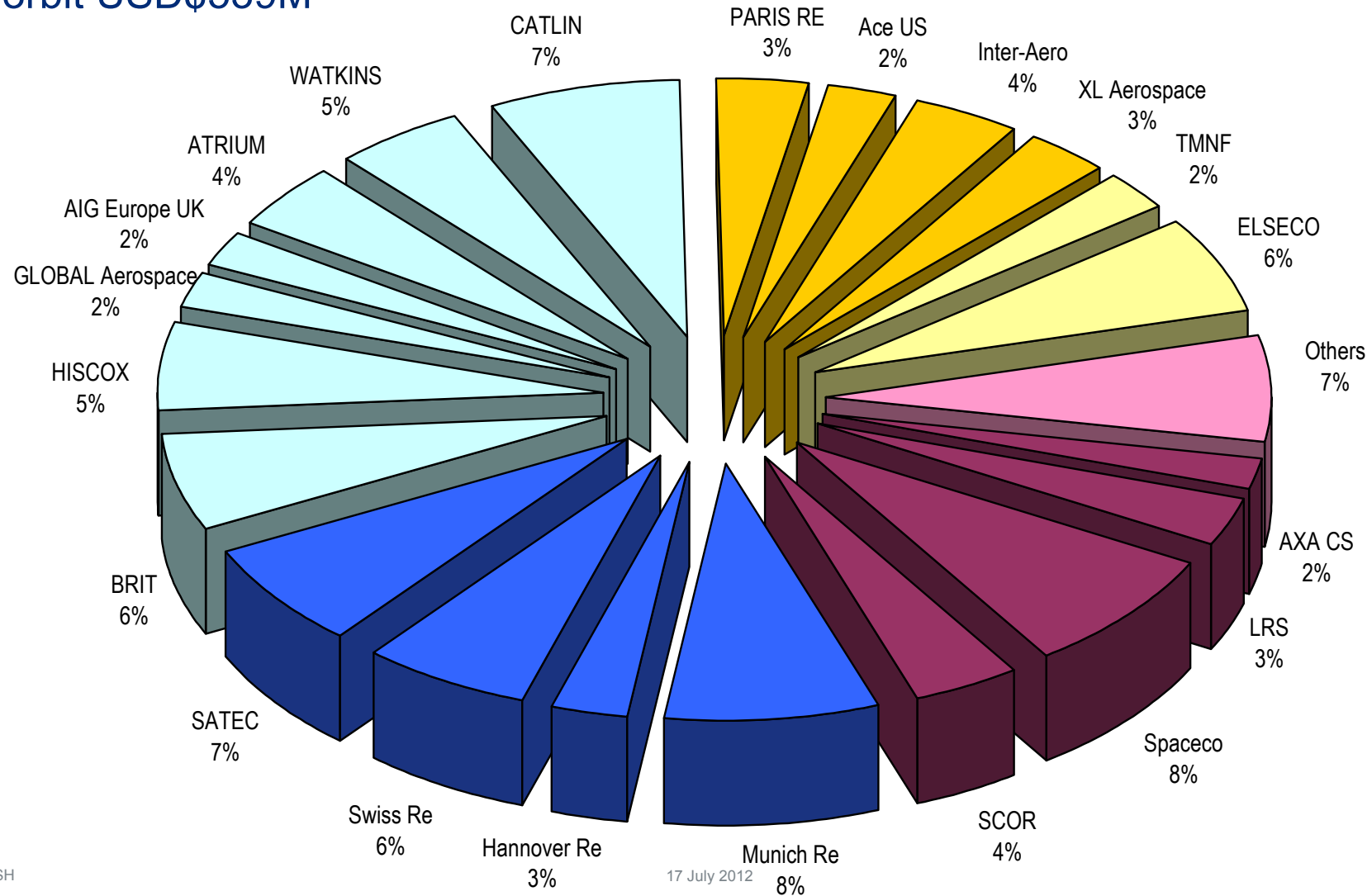
- Covers the pecuniary consequences of liability, which the insured may incur by reason of bodily injury, property damage and consequential loss sustained by any natural person or legal entity, AND caused by an event due to a default of a delivered space product (including delivered services).
- Stand-alone insurance
- Endorsement attached to an existing aviation product liability
- Different endorsements
- Spacecraft Product PD sub-limits
 - \$250 million any one satellite, or
 - \$125 million per satellite for multi-satellite launch

Space Insurance market



Space property damage market

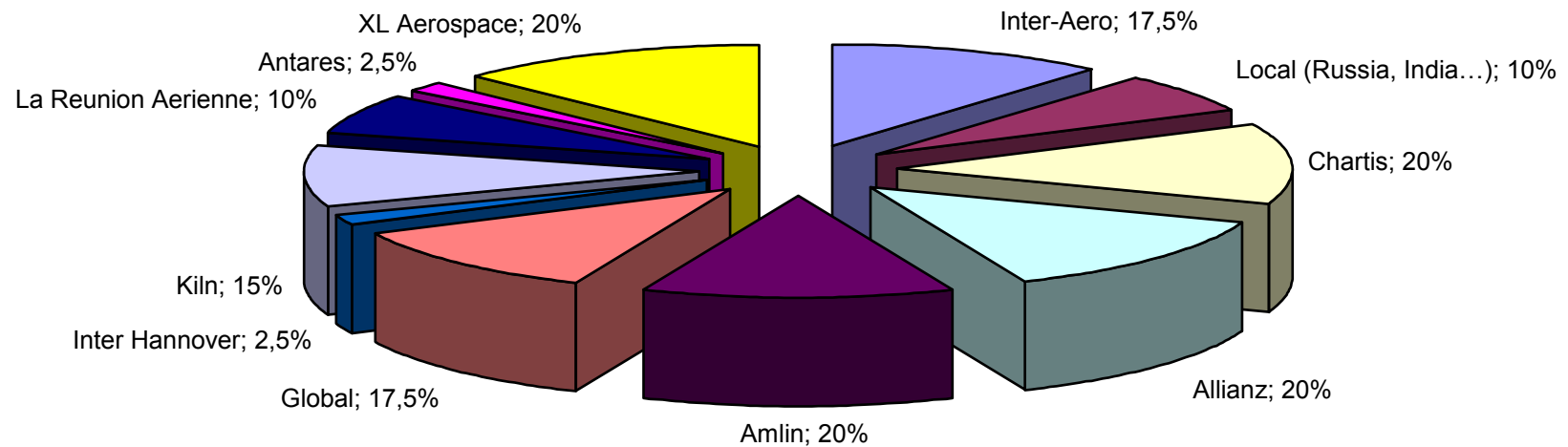
For 2011, the « usable » capacity is approximatively:
Launch USD\$639M
In orbit USD\$539M



Market Approach

- Capacity for satellite third party liability coverage is at least USD 500M, increasing to USD 750M per occurrence for a short risk period i.e. de-orbiting or launch flight.

RC Tiers Spatiale- Capacité pour 200MUSD (%)



Insurance VS Space sustainability



Insurance solutions iro space sustainability

- Historically, space debris risks have been considered very low by the insurers, especially in the GEO
- The number of space debris has increased a lot in the past decade (almost twice more in 20 years)



Where stands insurance with respect to space debris?

Insurance solutions iro space sustainability

Property damage insurances

- In case of damages caused to a spacecraft by a space debris, would there be an insurance cover available to the owner/operator of the damaged spacecraft?
- The standard property damages coverage drafted as an “all risks” insurance would be able to cover such damages, unless a specific exclusion is in the policy, which has not been the case up to date in our policies.
- This property insurance policies will cover the total loss, constructive total loss or partial loss of an insured spacecraft

Insurance solutions iro space sustainability

Liability insurances

- In case of damages caused to a spacecraft by a space debris, would there be an insurance cover available to the owner/operator of the spacecraft at the origin of the debris?
- The space third party liability insurance will cover the financial consequences of the liability of the insured in case of damages caused to third party and due to the space activity of the insured.
 - The insured shall bear a liability either as per specific laws or as per applicable common law.
 - The insured shall bear a liability in case of damages caused by a debris.

Insurance solutions iro space sustainability

Liability insurances

- On a standard basis, the space third party liability insurance covers the declared satellites/launchers for their space operations.
- Coverage can be triggered by:
 - Damageable fact: the generating cause of a loss shall occur during the period of insurance, whatever the date of the loss or the third party claim
 - Occurrence: accident or incident causing a loss occurring during the period of insurance
 - specific cover could be available on the market, at a specific premium rate

Insurance solutions iro space sustainability

Liability insurances

- After several years of coordination, at international level, a consensus has been reached on space debris mitigation measures:
 - IADC
 - UNCOPUOS
 - European code of conduct
- Dedicated regulation on space debris mitigation (as it is the case for some space law) that clarifies the allocation of liability for damages caused by a space debris will:
 - clarify the legal environment from the insurers' view
 - lead to adaptation of current insurance policies to be in conformity with such regulation

**THANK YOU FOR YOUR
ATTENTION**

