



In-Orbit Servicing: risks and insurance needs

D-ORBIT'S PERSPECTIVE

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«Le assicurazioni per lo spazio. Lo spazio per le assicurazioni»

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PIONEER IN SPACE LOGISTICS



300

people and
growing



15

missions



13

ION in
orbit



140+

payloads
in space



Commercial customers in
4 continents

Presence in Italy, UK,
Portugal and USA

Leading player in the
Space Logistics market

PRODUCTS AND SERVICES

ADDRESSING THE NEEDS OF TODAY WHILE DESIGNING THE TECHNOLOGY OF TOMORROW



Space Transportation Services: solutions to address the needs of the small satellite market in terms of launch and deployment, operations on payloads, including testing of new technologies in orbit.



Space Cloud Services: an innovative space cloud-based technology that will enable close to real-time data computing and data storage directly in orbit.



Satellite as a Service: a model that allows customers to leverage the capabilities of satellite technology without having to invest in and operate their own satellite infrastructure.



In-Orbit Servicing: services powered by proprietary robotic servicing vehicles designed to achieve multiple mission objectives throughout their lifespan (e.g., inspection, assembly, refurbishment, refueling, and debris removal).



Mission Exploitation Services: Aurora, a cloud-based mission control software suite designed to control a single satellite or a complete constellation through a control web interface.

D-ORBIT IOS BUSINESS LINE

THE NEXT GENERATION OF IN-ORBIT SERVICING SPACECRAFT

- D-Orbit is developing a dedicated In-Orbit Servicing business line
- GEA: a next-generation spacecraft with in-orbit servicing capabilities, such as rendezvousing, docking with, and taking over the attitude and orbit control functions of another spacecraft for repair, life extension, or disposal
- Multi-mission, multi-environment through physical re-configuration
- 7 years service lifetime



RISK TYPES IN IOS MISSIONS

OPERATOR'S PERSPECTIVE

- Asset value + service revenues
 - «first party» operator risk
- Property damage (or bodily injury) caused to the customer or other mission participants
 - «inter-party» liability
- Property damage (or bodily injury) caused to third parties
 - «third party» liability
- Analogous to risk types in «traditional» space missions
- Technical and operational complexity of IOS missions pose unprecedented challenges

OPERATOR «FIRST PARTY» RISKS

ASSET VALUE + SERVICE REVENUES

- «Traditional» space missions:
 - no-warranties clauses in the contract (es. launch contracts)
 - purchase of launch/in-orbit insurance

- IOS missions: no substantial difference, however:
 - complex multi-activity, multi-customer, multi-phase missions require ad-hoc insurance solutions
 - es. specific insurance policy for each phase/mission/customer or comprehensive «operational life» insurance package?
 - In the mid-term future market standard will move away from no-warranties clauses
 - expanded scope for new insurance solutions?

«INTER-PARTY» LIABILITY

PROPERTY DAMAGE CAUSED TO THE CUSTOMER OR TO OTHER MISSION PARTICIPANTS

- «Standard» launch missions:
 - cross-waiver of liability clauses
 - either voluntary or imposed by law (es. US FAA Waiver of Claims)
- IOS missions: no substantial difference
 - customer should be «ready» to lose spacecraft
 - cross-waiver of liability expected to become market standard also in IOS commercial contracts
- Is there room for voluntary or mandatory insurance? Should ad-hoc insurance solutions be developed?

«THIRD PARTY» LIABILITY

PROPERTY DAMAGE OR BODILY INJURY CAUSED TO THIRD PARTIES

- Most significant risk in IOS missions
- Challenges:
 - Missions' complexity and flexibility (unknown customers and unexpected operations)
 - hard to calculate the maximum possible loss (es. pollution of multiple orbits with space debris following an accidental collision)
 - collective interest involved
 - States exposed to international liability (Liability Convention)
 - role of the regulator and of domestic legal frameworks
- D-Orbit favours development of policy and regulatory incentives that foster the adoption of affordable TPL insurance

D-ORBIT'S REMARKS

- Risks and challenges of IOS missions still subject to technical assessment
- D-Orbit believes that insurance is an important enabler for the development of sustainable IOS capabilities and market
- Relevant themes:
 - more complex risk profile of IOS missions calls for new insurance solutions
 - insurance costs
 - availability and suitability of national legal frameworks and policies
 - challenges of multi-national missions
- Open to discussion among operators, insurers and regulators



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