

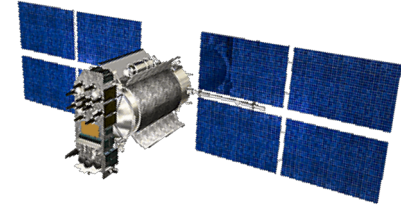
# On-orbit satellite servicing / Close Proximity Operations Legal aspects

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Cleanspace Industrial Days, ESTEC, 24 October 2018

# On-orbit satellite servicing (OOSS)



## Drivers

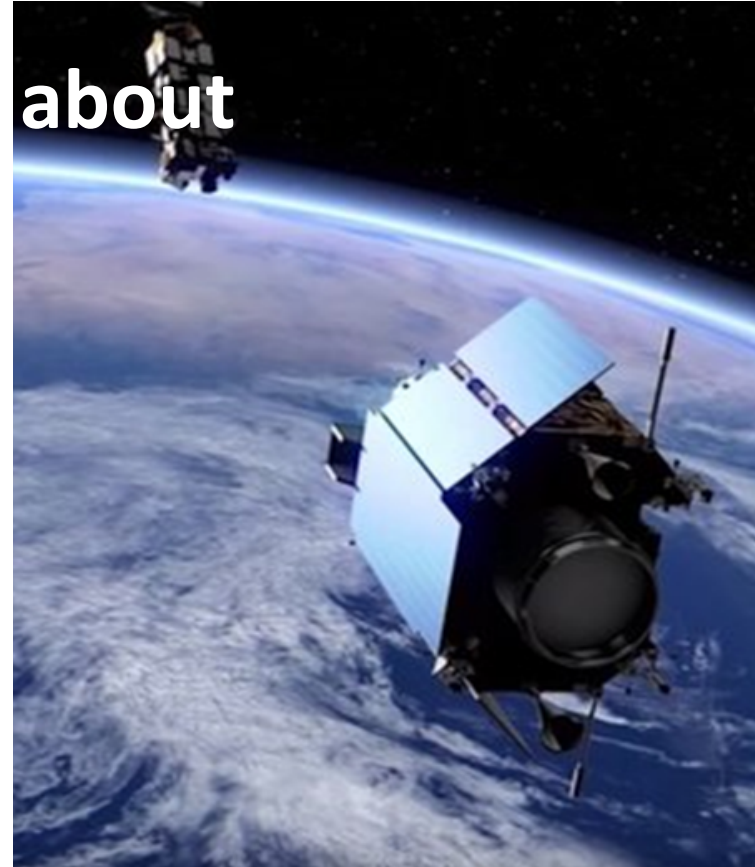
- to more fully exploit the flight systems already launched (lifetime / upgrade)
- to develop new systems that reliably and cost-effectively support space activities
- **to reduce, reuse and recycle**

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- Re-fueling
- Repairing
- Re-positioning
- Removing
- (Assembling)

# Framing what we legally talk about

- an **international law** perspective
  - States and international space law
- a **national** regulatory perspective
  - authorities and national space law
- a **contractual** perspective
  - service providers & customers and their contractual relations
- a **'soft law'** perspective
  - technical standards, guidelines, practices



# Some basic rights and duties

- States\* are **free to conduct** OOSS activities
- States are internationally **liable for damage caused by their OOSS activities**, including those of non-governmental entities
- States shall **authorise and supervise** OOSS activities
- States shall **register space objects** and **avoid harmful interference with others** when performing OOSS



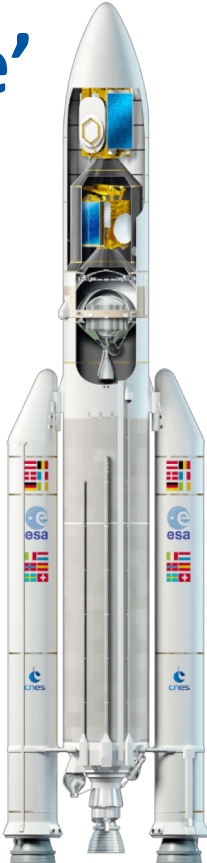
\* and IGOs  
like ESA

# The curious concept of the ‘launching State’

- Ownership of a satellite is of secondary importance.
- What matters is: **Who is the launching State?**

“who **launches** the satellite or **procures** the launch, and from whose **territory** or **facility** the satellite is launched”

- One satellite can have many launching States.
- One of those launching States must register the satellite and becomes the **State of Registry**.



# Launching State liability

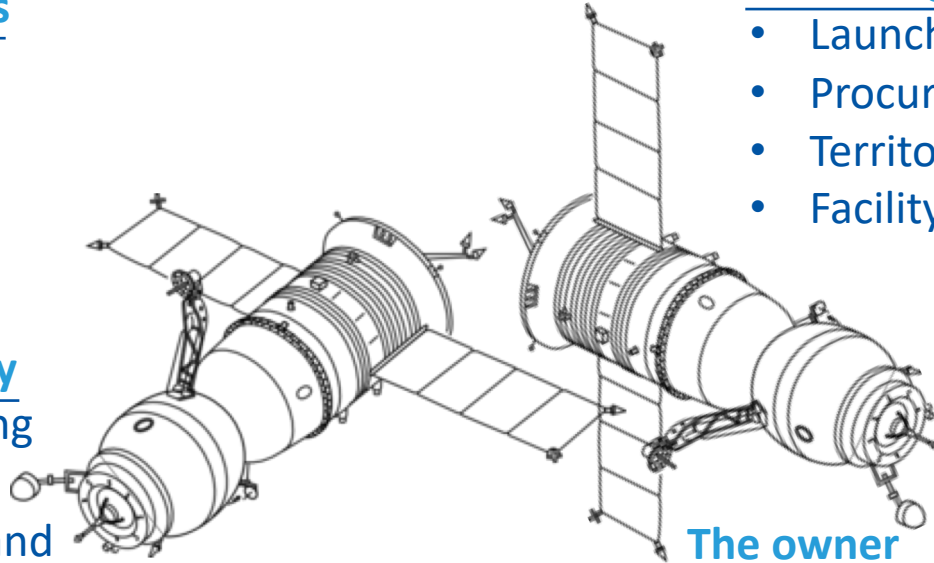
- The launching States are **collectively liable for damage caused** by the satellite, as long as it exists and regardless of its functionality or the ownership situation.
- **Damage caused in outer space** (to other S/C)
  - Liability **only if** the damage is due to **fault** (e.g. negligence)
- **Damage caused on the surface of Earth or to aircraft in flight:**
  - **Absolute liability** – automatic and without financial limit

### Launching States

- Launch
- Procurement
- Territory
- Facility

### State of Registry

- One launching State has jurisdiction and control



### The owner

- Property right over the asset

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Launching States



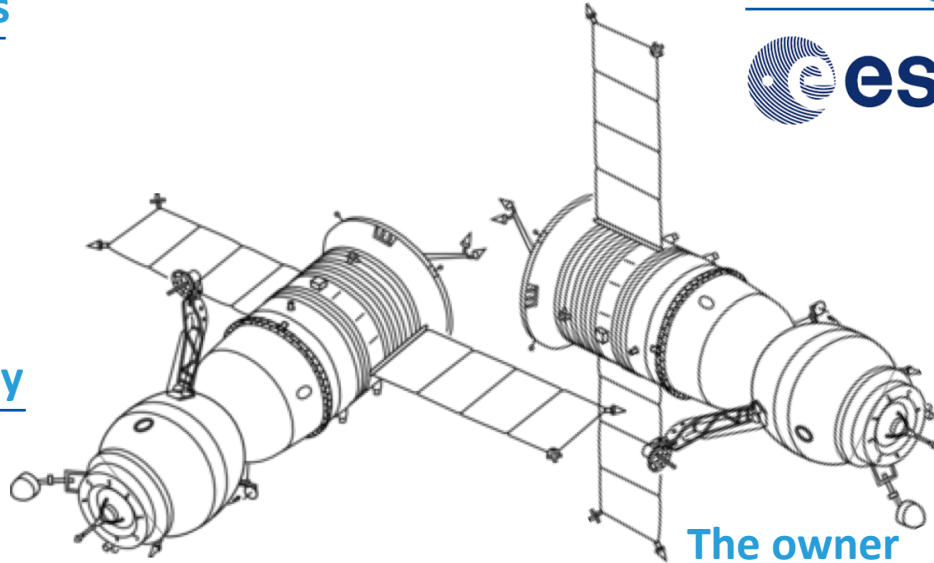
Launching States



State of Registry



State of Registry



The owner



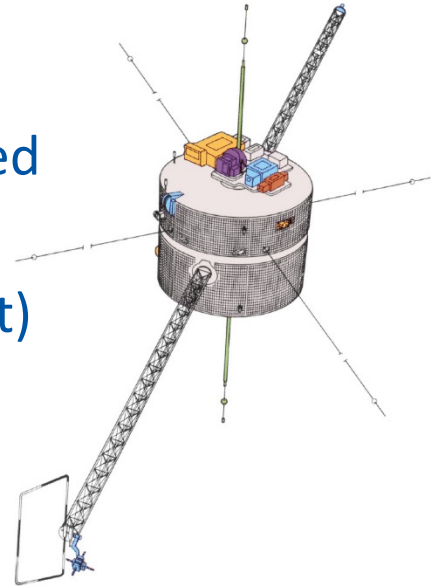
The owner





# Legal considerations for target selection

- Satellites and debris are **owned by someone**: non-functionality does not mean they are free to be captured
- An OOSS / ADR mission with **identical owners and launching States** (e.g. ESA spacecraft <-> ESA spacecraft) **reduces legal complexity**
- A future OOSS / ADR market will require novel legal approaches to reduce convolution of legal relations



# Measuring standards of care in space

- **Close proximity operations** → risk of unwanted interference or damage
- **no clear benchmarking for what constitutes ‘fault’ in relation to space operations in orbit**
- Non-compliance with existing guidelines and standards may be considered an element of fault
- Role for space actors and industry in creating ‘soft law’, e.g. future **OOSS / ADR guidelines or standards**



1. Legally speaking, OOSS / ADR are **space activities like any other**:
  - they need to be **authorised** (not for ESA missions)
  - States are **internationally liable** for any damage caused (also ESA and its Member States)
  
2. Due to the interaction with another spacecraft, **attention must be paid that**:
  - the target **owner and its Launching State(s) agree** to the service
  - **consequences (damage in particular) are clarified beforehand** between the parties of the service
  - there are **no other obstacles** (export control, harmful interference, etc.)
  - applicable **standards and procedures** are taken into account