Large satellite constellations

Alexander Soucek
Legal Officer, European Space Agency

ICAO / UNOOSA Symposium
15–17 March 2016, Abu Dhabi, United Arab Emirates
The European Space Agency

- Intergovernmental organisation with 22 Member States.
- Responsibility in nearly all areas of space activity.
- +80 satellites designed, tested and operated, 6 types of launcher.
- Worldwide cooperation, about 400 agreements.
Mega-constellations

• Future large satellite infrastructures in Low Earth Orbit (LEO) for telecommunication purposes.
• Saturation of GSO, complexity and cost to reach and service GSO, limited coverage, high latency time (700 ms vs. 30 ms).
• Concepts for hundreds up to thousands of satellites developed by commercial operators.
Requirements for LEO constellations

- Mass manufacturing of satellites with low per unit cost.
- Frequent and flexible multi-payload launches.
- Population of several orbital planes.
- Automation in orbit operations, in particular for CAM.
- Overall high satellite reliability incl. EOL.
Aspects of international law

• Space freedoms: orbit access and reliability.
• Collision avoidance in orbit and during ascent / descent through denser orbital regions.
• Spectrum access and coordination -> ITU (WRC19).
• Joint launches: registration; liability; export control.
• Space debris mitigation: effects on the orbital environment.
Aspects of national regulation

• Efforts to review the regulatory framework for large, long-living orbital infrastructures.
• Compliance requires to know which regime applies for international joint ventures.
• Relationship between regulator and operator: find mutually beneficial and viable solutions.
Contractual and insurance aspects

• Contractual challenges: testing, delivery, launches etc.
• Launch services: flexibility in service agreements; different types of launchers.
• Long-term operations and post-mission services.
• Risk quantification for large infrastructures: move towards aggregated insurance policies (per constellation)?
Summary: large satellite infrastructures

- Important increase in launch and orbital traffic.
- Paradigm change in satellite production and testing.
- (semi-)automated in-orbit operations including CAM.
- Legal and regulatory questions to be tackled.
THANK YOU

Alexander Soucek

European Space Agency

ICAO / UNOOSA Symposium
15–17 March 2016, Abu Dhabi, United Arab Emirates