Legal and practical considerations of registering constellations and space debris

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The language of the Registration Convention

• a pinch of ambiguity:
• ‘as soon as practicable’, ‘from time to time’, ‘to the greatest extent feasible’, ‘additional information’, ‘appropriate agreements’, ‘general function’, ‘equitable and reasonable conditions’.
• efforts towards a more uniform state practice: UNGA Res. 62/101 ‘Registration Practice Resolution’ (2007) and the OOSA ‘Registration Information Submission Form’ (2010).
Registration and notification

• Articles II and IV REG: processes for registering space objects and furnishing information to the UN.

• Distinction between ‘registration’ and ‘notification’.

• ‘Registration’ (Art. II para. 1 REG in conjunction with Art. VIII OST) establishes jurisdiction and control over a space object and turns a launching State into a ‘State of registry’ (in relation to the registered object).
State practice and the practice of IGOs

• heterogeneous state practice with regard to the REG.
• ESA -> first IGO to declare acceptance of the rights and obligations of the REG in 1978; new ‘ESA Space Object Registration Policy’ + multi-functional ESA space object register in 2014.
• legal and practical questions: *orbital debris, satellite constellations, transfer of ownership, launch from orbital platforms, aerospace vehicles and other non-orbital objects*. 
‘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.
Constellations: factual and legal perspectives

- 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: orbit and spectrum access and coordination; end of life; joint launches; registration, responsibility and liability; ADR; orbital environment, relationship btw. regulators and operators, etc.
The registration of constellations

- a practical rather than a legal issue: amount of satellites per constellation, replenishment, automated operations, etc.
- satellite batches per orbital plane as ‘single objects’?
- joint launches -> determination of the appropriate ‘State of Registry’ (c.f. Art. II para.2 REG).
Space debris

• “Space debris are all man made objects including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non functional” (IADC 2002).

• A legal and practical question is whether or not space debris can and should be registered, and if so, how.
The registration of non-functional objects

- A registered space object ceasing to be functional while in Earth orbit (or beyond) remains registered -> the State of Registry may provide “additional information” under Art.IV para.3 REG.

- Objects that are non-functional *ab initio* still should be registered.

- Functionality is not a criterion for registration nor for the exercise of jurisdiction and control or ownership.
The registration of fragmented objects (1)

• Do fragments have to be registered separately, and down to which size can one possibly, and reasonably, register them?

• Example: A registered satellite breaks up into two parts:
The registration of fragmented objects (2)

• **Argument A**: jurisdiction and control, once attributed to the State of registry, remain associated to an object “and its component parts” (Article I lit(b) REG) -> fragments considered as ‘component parts’ of the original space object.

• **Argument B**: A space object ceases to exist in the moment of disintegration or destruction -> runs contrary to the object and purpose of the space treaties (c.f. allocation and determination of responsibility and liability).
Space debris: practical considerations

• fragmentation events can produce hundreds of micro-objects: impossible to register or notify. Perhaps this is also not necessary:
  – legal registration =/ SSA database or object tracking catalogue;
  – “additional information” under Art.4 para.2 REG.

• The current state practice is heterogeneous.

• ESA Register ‘Main Section’ + ‘Annex Section’. If an ESA S/O becomes non-functional while retaining its physical characteristics and orbital parameters, ESA would notify this under Article IV para. 2 REG.
Conclusion

• Continued developments in spaceflight and the orbital environment require legal answers and practical solutions with regard to space object registration.

• These approaches must satisfy the terms of the Convention in good faith, in their ordinary meaning, in their context and in the light of the Convention’s object and purpose.
Thank you.

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