

IISL COLLOQUIUM ON THE LAW OF OUTER SPACE (E7)

Space Traffic Management: From Space Situational Awareness and Space Surveillance and Tracking to developing Rules of the Road (4)

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SPACE TRAFFIC MANAGEMENT: NOT JUST AIR TRAFFIC MANAGEMENT FOR OUTER SPACE AND MORE THAN DATA ANALYTICS

Abstract

Space Traffic Management is a complex concept that consists of technical, organisational and regulatory elements. It is not foreseen in the Outer Space Treaties and yet considered a crucial concept for a safe and sustainable access to space and interference free operations in space.

Space Situational Awareness and Space Surveillance and Tracking are not identical to Space Traffic Management which is broader and reaches farther. Space Situational Awareness and Space Surveillance and Tracking are cognitive elements of Space Traffic Management.

Air Traffic Management is often used as a reference for Space Traffic Management. However, not only the legal regimes of sovereign airspace as opposed to the regime of Outer Space are substantially different. Along the differences of the physical characteristics support different technical approaches in air space and Outer Space. Motions in air space that follow aerodynamics and non-orbital ballistics tend to be short lived and henceforth air traffic control has evolved from short term, tactical measures. Opposed to that, objects in Outer Space follow orbital dynamics and their trajectories persist for longer periods, so that control procedures need to address longer term effects and be of a strategic nature. In that context, Air Traffic Management has evolved in an opposite direction than Space Traffic Management.

During recent years, rule-making for Space Traffic Management takes new roads. Lacking hard treaty law, an increasing range of non-binding standards, national regulations, practices of private bodies, voluntary information exchanges and cooperative routines tend to synchronize selected elements of Space Traffic Management. In addition, data analytics is taking an expanding role in Space Situational Awareness.

This paper will identify the building blocks of Space Traffic Management and address the following topics and their legal and policy implications:

- Definition issues
- The relationship between Space Situational Awareness and Space Surveillance and Tracking
- Space Traffic Management versus data analytics
- The impact of orbital dynamics versus aerodynamics and non-orbital ballistics
- Space Traffic Management versus Air Traffic Management
- De-confliction of space objects and aircraft in (national) air space
- Tactical versus strategic measures
- Prescriptive rule making versus practice and cooperative efforts
- The role of States, operators and service providers