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CISLUNAR NETWORKS: LEGAL AND REGULATORY ISSUES RELATED TO THE ESTABLISHMENT OF HYBRID EARTH-MOON SATELLITE COMMUNICATION SYSTEMS

Abstract

Recent developments in space technology have reinstated the Moon as humankind's primary target for near future space missions. Although stakeholders are still developing the case to make the Moon a commercially viable domain, the establishment of any permanent lunar bases, orbital stations in lunar orbit, and/or mining operations on the Moon will invariably require a financially attractive, sustainable, and efficient hybrid Earth-Moon satellite communication system with a least latency low enough to support high performance data communications on and around the Moon.

When dealing with satellite communication systems in Earth's orbit, Fixed-Satellite Service (FSS) and Non-Geostationary Operators (NGSO) providers have to comply with a patchwork of national and international rules, including a complex regime of authorisations and licences to access spectrum, orbit resources, landing rights, and authorisations and licences for the space activity itself. This regulatory framework was designed for communication services intended to only receive and transmit data to and from Earth and does not necessarily take into account the possibility of up and downlink of data on the Moon.

This paper outlines the current regime for authorising and licensing satellite communication services on Earth and applies it, mutatis mutandis, to a hypothetical Earth-Moon satellite communication system. It aims to identify its shortfalls when faced with cislunar networks, so that future scholarship, States, international organisations, and other stakeholders can further understand the challenges and develop a more comprehensive regulatory regime to enhance international cooperation and enable these activities to take place in a safe manner. A cursory review of the applicable international law will be performed, including an analysis of the ITU frequency allocation and spectrum rights use regime and its suitability and applicability to the lunar environment. Selected national space laws will be analysed regarding the necessary authorisations for conducting a cislunar satellite business, the protection of the lunar environment, due to its special atmospheric and gravitational characteristics, as well as any possible conflict of landing rights, i.e., permissions that operators must obtain for their satellite to be used in a particular country - in respect to services targeted at lunar bases composed of modules registered in different States. Finally, recommendations at international and national level are proposed and explored to provide States and operators with further legal certainty for safe, sustainable, and viable cislunar satellite communication systems.