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ENSURING SUSTAINABLE SPACE ACTIVITIES IN LEO: POSSIBLE BINDING REGULATIONS INSPIRED BY PRINCIPLES OF RESPONSIBILITY AND LIABILITY

Abstract

The paper outlines an approach that takes into account the global scenario of Space Economy where the trend is the intensification of space activities, the participation of multiple public and private actors, new initiatives, and the growing demand for space services. Consequently, the near-Earth orbital environment (LEO) is becoming more crowded than others, due to the large telecommunications constellations and Earth observation satellites/constellations. This has increased the attention on the issue of collision risk and has led to the need for a space traffic management (STM) framework aimed at encouraging operators to implement preventive measures such as satellite passivation, collision avoidance, and controlled de-orbiting to reduce the likelihood of uncontrolled debris reentry affecting high-risk areas and endangering the population. Existing collaborations and space agencies are all concerned with ensuring a globally harmonized and efficient system, for this reason they are introducing measures for of debris mitigation and debris remediation. The paper, based on current international regulations and legal framework, orbital licensing, registration procedures, and cybersecurity issues, will propose possible binding regulations inspired by principles of responsibility and liability for sustainable space activities. Additionally, it will address the possible organization for STM, taking into account existing international public or private bodies, the role of international cooperation, potential financial incentives and funding to mitigate the debris phenomenon. Other Space Economy implications are relevant to the space insurance regulation, including also policies for launches, operations, and satellite re-entry. In conclusion, the purpose is to analyze the causes of damage to third parties and infrastructure in case debris fails to reach designated safety areas. It also aims to envision the growth of greater awareness about the conditions and regulation of space traffic, thus leading to the stabilization of a multidisciplinary approach that underscores the need for global coordination to ensure outer space safety and the preservation of the Earth's environment. Ultimately, this promotes a sustainable and innovative vision for the future of space activities.