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Policy, Legal, Institutional and Economic Aspects of Space Debris Detection, Mitigation and Removal
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POTENTIAL EXPORT CONTROL CHALLENGES AND CONSTRAINTS FOR EMERGING SPACE
DEBRIS DETECTION AND REMOVAL TECHNOLOGIES – THE CASE OF ON-ORBIT COLLISION

Abstract

The sustainability of Outer Space in a context of increased human activity in the LEO has been much debated lately. The discussion focuses on how space debris appear, how they can be limited and, possibly, removed. Commercial proposals for Active Debris Removal (ADR) are slowly emerging as precursory technological tools raising a host of legal, regulatory, and policy challenges that need to be discussed as ADR projects progressively mature. ADR technologies will involve so-called on-orbit servicing activities, i.e. activities performed on a spacecraft while it is in or near its operational orbit and will require that one spacecraft approach, rendezvous and interact with the asset/the debris to be removed. Those cutting edge technologies have potent capabilities and a potential for military and missile technology applications. As a result, they will be controlled by export control regulations (possibly by U.S. export control regulation) and might fall under the stringent ITAR requirements. ADR inevitably involves the coupling of two different actors, the servicing spacecraft performing the ADR, and the asset to remove. From an export control perspective, depending on the circumstances of each mission, in particular on the nationality of the servicing spacecraft and the one of the debris, the exchange of information between them might qualify as an export of technical data and would need to be licensed and authorized accordingly. In addition, because of the coupling of those two actors, the ADR model presents an inherent complexity: it creates a greater risk of technical failures, in particular of on-orbit collisions. As a consequence, it can induce more opportunities to exchange technical data in a context of urgency that prompts omissions and ultimately, more opportunities for violating export controls. This would apply even if technical data is exchanged for insurance or investigation purposes. Thus, any situation of on-orbit failure in the context of an ADR presents a risk of inadvertent export control violation. In the past, inadequately managed launch failure investigations of satellites launched on non-U.S. launchers caused major export control violations and were to have a profound impact on the U.S. export control system. After observing how technological measures can mitigate risks of export control violations, this paper will propose a normative suggestion to mitigate potential ITAR violations and to avoid inadvertent export control situations in case of on-orbit failures in the context of an ADR.