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ON-ORBIT SERVICING: THE KEY TO SUSTAINABILITY IN SPACE OR AN EMERGING ARENA
FOR ARMED CONFLICT?

Abstract

As space becomes increasingly congested, on-orbit sustainability efforts will likely create a new arena for national security threats. The sustainability of space is paramount. Particularly, dead satellites and debris continue to choke Earth's orbital plane, causing a problem for space assets. On-Orbit Servicing (OOS) has the potential to transform the space sector by increasing satellite resiliency and advancing space sustainability through satellite repairs, refueling, and hardware upgrades. Consequently, this means space assets would now have an extended life, but the dual-use nature of OOS operations inevitably raises concerns for national security threats. One act of aggressive behavior could start the chains of events needed to render space inoperable due to cascading debris collisions.

Due to different rationales, priorities, and objectives on how space should be governed, past discussions on space security efforts have had difficulty gaining acceptance. Accordingly, this drives the need for renewed international discussion on space security efforts to address the vulnerability of assets against potential security threats. Presently, national law and international treaties governing space activities help keep major security threats under control. The crux of the issue is, will these measures continue to hold as more countries declare space as a war-fighting domain? Specifically, will existing treaty obligations and operator transparency be enough to ensure peace in the space domain? The global economy is inherently dependent on space infrastructure. Therefore, fast action for ensuring peaceful operations during the advancement of sustainability efforts is essential.

This paper surveys current efforts to conceptualize the peaceful uses of space as it relates to dual-natured operations of OOS. First, this paper will discuss the scope and necessity of current and predicted capabilities of OOS. Second, it will highlight present conciliatory approaches to increase space security and their significance in the event of a breach. Third, analogies and parallels will be drawn from other war-fighting domains, space diplomacy efforts, and international studies to identify aspects of space security efforts that need further clarification. In conclusion, this paper will summarize the critical issues requiring international discussion and draw upon possible efforts to theorize a path for optimistic advancement in OOS security efforts.