

SPACE DEBRIS SYMPOSIUM (A6)
Mitigation, Standards, Removal and Legal Issues (4)

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ORBITAL COLLISIONS AND SPACE DEBRIS - INCIDENCE, IMPACT AND INTERNATIONAL
POLICY

Abstract

Since the dawn of satellites in the early 1950's, space debris from intentionally exploded spacecraft, dead satellites, and on-orbit collisions has significantly increased and currently outnumbers operational space hardware. Adding to this phenomenon, the advent of commercial spaceflight and the recent space activities in China and India to establish themselves as space-fairing nations are bound to accelerate the rate of space debris accumulating in low earth orbit, thus, exacerbating the problem. The policies regulating orbital debris were drafted in the 1960s and 1970s and fail to effectively address the dynamic nature of the debris problem. These policies are not legally enforced under international law and implementation is entirely voluntary.

Space debris is a relevant issue in international space cooperation. Unless regulated, some projections indicate space debris will reach a point of critical density, after which point the debris will grow exponentially, as more fragments are generated by collisions than are removed by atmospheric drag. Space debris proliferation negatively impacts human spaceflight safety, presents a hazard to orbiting space assets, and may lead to portions of near-Earth orbit becoming inaccessible, thus limiting mission operations.

The aim of this research effort was to review current international space policy, legislation and mitigation strategies in light of the past half-century of United States space flight and two recent orbital collision episodes. The first case study is the February 2009 collision between a defunct Russian Cosmos spacecraft and a commercial Iridium satellite. The second is China's display of technological prowess during the January 2007 intentional demolition of its inactive Fengyun-1C weather satellite using a SC-19 anti-satellite (ASAT) missile. In each case the stakeholders, politics, policies, and contributing factors that lead to the collision were analyzed and recommendations for alternative preventative and regulatory strategies set forth.

Possible future policy and regulatory mechanisms for effectively dealing with space debris are proposed and relevant policy issues are discussed. These issues include: Who needs to be held responsible when two satellites collide while in orbit? Who should be given the authority to monitor spacecraft in an effort to prevent orbital collisions? How much access should be granted to the monitoring agent(s)? What should be the procedure for decommissioning old satellites/spacecraft? How does the proposed regulatory strategy affect international relations and National Security issues? What are the foreseeable consequences? The results of this analysis, as well as possible alternative mitigation and regulation strategies are presented.