

SPACE DEBRIS SYMPOSIUM (A6)

(joint session with Space Security Committee): Policy, Legal, Institutional and Economic Aspects of Space Debris Detection, Mitigation and Removal (8)

Author: Mr. Sylvain MEMAIN
Toulouse Business School, France

IS THERE A BUSINESS OPPORTUNITY IN CLEANING SPACE FROM DEBRIS?

Abstract

We are a team of four authors writing this research paper. I would like to present it for the team and to bring it to the international aerospace congress in order to discuss more with engineers and the main actors of the industry.

The amount of debris in Low Earth Orbit (LEO) is exponentially increasing with, in short- and medium-term, potential collisions among large and extra-large debris population. Actually, main actors and researchers are developing many technical solutions to protect satellites and spacecraft or to move debris from this orbit. In our research paper, we try to present the “state-of-the-art” of existing solutions and we furthermore analyze economic and technical issues jointly in order to provide recommendations to mitigate debris proliferation in LEO. We think this is the cornerstone to secure long-term commercial Space activities while also assessing the opportunity to make a possible business with cleaning space from debris. In this study, we are defining history and orbital debris in order to introduce a description of the space junk environment. Because life of debris is considered endless compared to humans’ and because of their proliferation, the debris population has reached the point where the environment is unstable and collisions will become the most dominant debris-generating mechanism in the future destroying future economic value. We are also presenting a breakdown of debris by origin in order to understand the main political issues. Moreover, we are showing economic and legal factors that explain the current “nothingness” situation. Actually, the Tragedy of the Commons according to Hardin (1968) is defining best the situation. We found out that legal and political factors are directly linked to the States’ willingness and international laws. Then, we are describing a range of the most advanced technical solutions according to the size of debris and evaluate the associated estimated costs. Finally, we are giving possible scenarios to fund the cleanup of space debris in LEO and international recommendations regarding legal and economic issues with detailed schedules. The motivation for our study lies in the perennial future of a safe and peaceful use of Space for humanity without precluding economic interest and viability.