

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

Author: Dr. Clemens Kaiser
OHB System AG - Munich, Germany

Mr. Eduardo Bellido
OHB System AG - Munich, Germany
Dr. Peter Hofmann
OHB System AG - Munich, Germany

SPACE DEBRIS MITIGATION USING ON-ORBIT SERVICING SOLUTIONS

Abstract

The OOS activities are enjoying a major boost, especially those related to docking/berthing, life extension and space debris mitigation. The main activities focus on the design and development of precursory capabilities for the benefit of the European public, commercial and military assets.

Germany is at present putting an important effort in developments in this field through the German Agency and Research Centres, DLR, and KAYSER-THREDE, a European leader system house for on-orbit service and robotic payloads, with a major involvement in programmes like :

OLEV (Orbit Life Extension Vehicle) designed to dock to a semi-cooperative GEO satellite and extend its lifetime, enhance the operator's fleet management capabilities, reduce in-orbit risks, perform rescue missions activities, continue operations of satellites with propulsion anomalies and reorbit satellites.

DEOS (DEutsche Orbital Servicing mission) consisting on the rendezvous with a LEO uncooperative (tumbling) client satellite followed by a controlled de-orbiting (controlled disposal) of the mated couple.

VIBANASS (VIsion-BASed Navigation Sensor System) as a full functional unit for an universally applicable optical Rendezvous, Docking und Landing (RVDL)-camera for the preparation and processing of the camera data as input signals for an RVDL control algorithm.

ROKVISS (RObotic Components Verification on the ISS) with demonstration and operations of robotic components under space conditions. SDMA (Space Debris Mitigation and Awareness) proposing a mission scenario with several building blocks based on the OLEV technology and the synergies gained through the activities in the other German robotic programmes.

Such programmes are in line with the following priorities:

- Technology development: advanced programmes to gain an independent European system to service our assets.

- Risks mitigation: Development of systems that permit Europe to remove space debris and hence the protection of the strategic asset that represent the orbits and especially of the unique resource for the Earth communications infrastructure, the GEO ring.

- Awareness: In-situ surveillance capabilities through advanced optical technology.

- Competitiveness: Development of new technology in Europe to be in the front-line of international technology and establishment of competitive advantages.

Most of these programmes have in common the development of key technology, the wide field of applications (commercial servicing, reorbit, public satellites, military), their relevance (the risks to the continuity of operations in the GEO ring due to space debris, the removal of dangerous satellites from LEO) and their transfer potential to other type of missions such as exploration and Earth applications.