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UNLOCKING THE POTENTIAL OF THE IN-ORBIT SERVICING MARKET: KEY SEGMENTS AND THEIR FUTURE VALUE

Abstract

The global market for In-Orbit Servicing is forecasted to reach 4.4Bn$ by 2031 (Euroconsult). The IOS market may be divided into several segments, each with its own unique set of challenges, opportunities, and growth potential. These segments include orbit insertion, active debris removal, refuelling, life extension, repair and upgrade, inspection, and manufacturing and recycling and assembly.

Orbit insertion and life extension are the most mature. Orbit insertion is forecasted at 600-1500M$, while life extension is forecasted at 1400-4800M$. The latter is already showing signs of maturity, with commercial servicer Northrop Grumman's MEV-1 and MEV-2 in 2019 and 2020.
Active debris removal is projected to be worth between 600 and 1500M$. ADR is emerging, with first missions planned by ESA and JAXA in 2025. Companies such as ClearSpace and Astroscale are already developing services.
Inspection, which will be driven by insurer and operators of high value assets and constellations, has a forecasted market value between 110 and 540M$. This segment is emerging, with the potential to mature by 2030.
The remaining segments of the IOS market show promise for growth, but have a higher level of uncertainty in terms of market value and timeline to maturity.

These exciting market segments are still in their infancy and significant uncertainties remain. Technical challenges include the development of robotics and automation systems, autonomous RPO, standardised interfaces, etc. Regulatory challenges include definition of a legal framework for in-orbit servicing activities, addressing issues related to ownership, liability, and safety of space assets during servicing operations, etc.

To embrace IOS, SAB Launch Services has been working on IOSHEX, with the scope to expand its portfolio beyond launch services and towards in-orbit services. IOSHEX is an IOS orbital platform developed on the existing structure of the SSMS dispenser. IOSHEX can be embarked on VEGA and VEGA-C with little impact on the launch capacity, due to its structure being already part of the L/V, being able to reach orbit and provide services in a cost-effective way.

In this paper, we will focus on the trends of each segment in the IOS market, and evaluate their potential value, presenting an in-depth analysis of specific missions that have taken place or are planned, and an overview of developments at SAB. Our aim is to provide a comprehensive overview of the market and offer insights on how it can be tackled from a service provider point of view.