

BUSINESS INNOVATION SYMPOSIUM (E6)
Case Studies and Prizes in Commercial Space (1)

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ASSESSMENT OF THE ECONOMIC AND BUSINESS CASES FOR ON-ORBIT SATELLITE
SERVICING

Abstract

In recent years, the interest in robotic on-orbit satellite servicing (OOS) capabilities has grown significantly. Representatives from commercial, civil, and national security space have each begun independent undertakings to expand upon the capabilities. Many of these organizations are basing their developments upon a long history of OOS missions, although nearly all of those utilized human astronauts. Only relatively recent missions began testing the capabilities of autonomous robotic servicers. Although the missions carried out so far have performed various types of OOS operations, there are servicing methods that have yet to be proven at all, let alone autonomously. While the technical ability to perform the various mission types is clearly a significant consideration, and one that must be overcome, there are a number of other factors that must be taken into account when assessing the development of long term OOS operations. Whether these operations are forever carried out by government entities, or a thriving commercial market develops to handle the operations, the market demand and returns of OOS activities must be taken into account. This study reviewed and analyzed the results of published studies that assessed the potential market demand and business cases for OOS activities. An aggregation and comparison of market demand studies was performed to assess the most likely scenarios for potential OOS missions. Business case studies were reviewed and assessed for their accounting of risk and uncertainty. Additionally, various OOS mission types were analyzed to determine the overall set of risks associated with each in terms of technology readiness, complexity, business cases, and other features. This study finally combines all of this analysis to provide an overall view of the feasibility of future OOS activities.