IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems (4)

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ESA SPACE RIDER: END-TO-END IN-ORBIT SERVICING TO EMERGING NEW MARKETS

Abstract

The fast development of "new space" industry over the last few years has given rise to new ideas for the development of commercial operations in Low Earth Orbit (LEO), beyond just satellite needs. ISS extensive technical and technological advancements represent a solid background, however ISS it is only one platform and one that was never intended for commercial operations and manufacturing.

The Space Rider System (SRS) is a response to these instances, providing affordable return capabilities for a wide range of payloads.

In addition to the technical and technological challenges faced while developing SRS up to the successful Critical Design Review and close-out of the Phase C of the Programme, there was also a totally new endeavour needed to support the preparation of the vehicle and the accommodated Payloads in the Cargo-Bay throughout the whole mission lifetime. This included not only the design, development, and qualification of the so-called Payload Aggregate Aggregate, but also the manufacturing of the Aggregate parts needed to assist and support the Payloads during their ground preparation, their integration in the vehicle and their in-orbit operations.

Moreover, ESA has set clear objectives in making this project commercially scalable and sustainable to ensure future profitability an establish a rewarding ecosystem to European industry in the years to come. To this end and in parallel to the mentioned Aggregate definition and Payloads preparation engineering effort, ESA has developed the Project business model, strongly anchored to a first-hand deep knowledge about the micro-g and IOV/IOD emerging markets by merging ESA internal experience with industrial experience both from Primes and commercial partner entities, by making use of deep and long term technical experience on ISS and other experimentation platforms and finally also through extensive collaborations with external specialised entities.

This paper describes the technical challenges and the design solutions for SRS Payload Aggregate definition, the process to demonstrate SRS full operational capability and commercial positioning to support each Customer Payload mission requirements and the definition of its dedicated orbital operations, focusing on Inaugural Flight major Payloads requirements and how they will be met based on available range of services provided by SRS.