

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems Verification and In-Flight Experimentation (6)

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OVERVIEW OF THE QUALIFICATION AND REFURBISHMENT APPROACH IMPLEMENTED BY
SPACE RIDER SYSTEM TO ACCOMPLISH REUSABLE SPACE MISSIONS.

Abstract

The Space Rider reusable re-entry vehicle is going to target its System CDR completion. The accomplishment of the demanding 6 flights reusability requirement is a driver for the shaping of the design, development and qualification processes. Strategies followed since the early equipment identification and their subsequent performance evaluation in the frame of the mission environments have been deeply addressed by the challenging capability to perform 6 complete missions from launch to touch-down and on-ground maintenance / refurbishment operations before the subsequent flight.

Space Rider is conceived to enable routine “access to” and “return from” space to any Payloads end users which want to experiment, demonstrate and validate in LEO a variety of application payloads and technologies for subsequent return and analysis. The achievement of the 400 Km target orbit is allowed by the VEGA C launcher, being the 2 months orbital experimental phase ensured by the AOM (modified VEGA C fourth stage acting as service module) integrated with the Re-entry vehicle (RM), the latter representing the evolution of the IXV demonstrator. The capability for a re-entry through the Earth atmosphere is realized by the RM reusable module that, after a precision landing will undergo a 6 months of refurbishment before the re-flight. The present paper deals with the integrated aspects regarding reusability and declined to the different vehicle levels (equipment, subsystems, system) and though the complete engineering processes, from design conception, development, qualification, up to exploitation of post-flight refurbishment and maintenance sequence.