

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

Author: Mr. ANGELO DENARO  
Thales Alenia Space Italia, Italy

Mr. Giorgio Tumino  
European Space Agency (ESA), France

SPACE RIDER: A REUSABLE RE-ENTRY SYSTEM FOR MULTISERVICING EXPERIMENTATION  
PAYLOADS

**Abstract**

The SPACE RIDER program is conceived by Europe as the first opportunity to implement routinely flights to LEO and back to Earth ensuring in-orbit experimentation to Payload Users and limiting the cost of access to space through reusability and fast refurbishment turnaround time. The Program is managed by TASI and AVIO in Co-primership under ESA contract. The achievement of the 400 Km target orbit is allowed by the AVIO VEGA C launcher, whose fourth stage (AOM), modified to perform as a service module, is integrated with the Re-entry vehicle (RM), constituting the complete Space Rider System (SRS). The integrated SRS allows exploiting (but without being limited to) microgravity and biological experiments, Earth and Space observation, Radiation exposure and materials science. Primary objective driving the core of the Space Rider architecture and mission profile is represented by the Multi Purpose Cargo-Bay located in the central section of the re-entry vehicle, where the experiment payloads are embarked, and by the servicing subsystems (power, data handling, thermal control, mechanical loads attenuation, pointing provisions...) which provide the payload with the most comfortable environment and efficient interfaces, unavoidable prerogatives for a complete satisfaction of the Customer(s) expectations. Architectural choices of the Re-entry module are integrated with the different attitudes assumed during the orbital phase to maximize service provisions and quality of the environments. The present paper deals with all peculiar architecture and mission related characteristics of the Re-entry module, also highlighting new operations task devoted to loading and retrieval of biological payloads.