Paper ID: 49185
oral

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Vehicles – Mechanical/Robotic/Thermal/Fluidic Systems (7)

Author: Dr. Alberto Sanchez Cebrian
beyondgravity, Switzerland

Mr. Boris Ulrich Halter
RUAG Space AG, Switzerland
Dr. Tobias Gerngross
beyondgravity, Switzerland

RUAG'S DEVELOPMENT OF A MODULAR LOW-SHOCK JETTISON SYSTEM

Abstract

One of the key events in a satellite launch mission is the separation and jettison of the payload fairing (PLF) from the launcher. RUAG Space, the leading supplier of products for the space industry in Europe, designs, builds and develops payload fairings. This includes the separation and jettison systems for which RUAG has developed solutions for multiple launchers classes. To ensure 100

Most separation and jettison solutions rely on pyrotechnics for the separation event. The main advantages of those are their flight-proven reliability, low weight and its simplicity compared to more sophisticated mechanical systems. However, they also induce a shock load to the rest of the launcher structure at the separation event. This requires that all the components attached to the PLF, including the rest of the launcher and payload, are designed to sustain this load case. During recent years, there is an increasing demand from the launcher primes and satellite suppliers to improve the payload comfort. As a result, the space industry is working on solutions to reduce the vibrations and shocks transferred to the Payloads during all mission phases, including the separation event. Aiming to supply our customers with products with more added value, RUAG Space is working towards a low shock separation and jettison system.

The proposed solution for the jettison system consists of hinges and cold gas actuators located in the lower region of the PLF at the interface to the launcher. A benefits of this solution is the possibility to use COTS components. As the separation system is triggered, the actuators initiate a rotation of the PLF with respect to the hinges located at the lower end of the PLF. Once a certain disengagement angle is reached, the hinges release and the PLF halves are jettisoned away from the launcher.

This presentation will provide some insight into the development of the hinge and actuator system at RUAG Space funded by ESA. These activities include the design, verification and full-scale testing of the proposed solution.