

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Technologies for Future Space Transportation Systems (5)

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## DEVELOPMENT OF A MODULAR LOW-SHOCK SEPARATION AND JETTISON SYSTEM

**Abstract**

The payload fairing (PLF) protects the payload on a launch vehicle during launch preparation, launch and ascent and provides a safe environment until the PLF is separated and jettisoned from the launch vehicle. Many separation and jettison solutions used today in medium and large launch vehicles are pyrotechnic. They have the advantage of an extensive heritage, high reliability, high energy/mass ratio and design simplicity. However, they generate a shock load during the separation event that is transferred to the rest of the structure. In recent years, there is an increasing need from payload customers to improve the comfort of their products until they are deployed in orbit. RUAG Space, Europe's largest independent supplier of space subsystems and components, is developing solutions to reduce these loads. Activities include the design, development and verification of a low-shock separation and jettison system compatible to different PLF classes. To maintain 100

To ensure this, RUAG Space is developing a modular, low-shock separation and jettison system. The solution involves a sequence of steps, starting with a simultaneous vertical and horizontal separation along the respective separation lines. Passive cold gas actuators then push the two PLF halves apart and they start a symmetric rotation around hinges located at the lower end of the PLF. Once the disengagement angle of the hinges is reached, both PLF halves are safely jettisoned away from the launch vehicle. An advantage from this solution's modularity is the possibility to adapt the same jettison principle to different payload fairing geometries and classes at reduced development effort. This presentation will provide insight into the development status of the low shock separation and jettison system at RUAG Space, including the design and verification of the proposed solution for a medium launch vehicle.