

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch Vehicles in Service or in Development (1)

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SOYUZ-FREGAT LAUNCH SYSTEM VERSATILITY

Abstract

The introduction of the Soyuz 2 launch vehicle by the Samara Space Centre in 2006 was a major improvement for the Soyuz launch system, providing both mission flexibility with the digital flight control and increased in-orbit capacity with the RD-0124 engine. Eumetsat and the European Space Agency contributions were key factors to the success of these Russian developments carried out within the frame of launch services contracts with Starsem.

The Fregat upper stage was successfully introduced by NPO-Lavotchkine in 2000 to launch the Cluster 2 missions for the European Space Agency. With a multiburn capacity, the Fregat stage allows complex orbital maneuvers to deliver payloads to various orbits, ranging from the low Earth orbit to the GTO, the Lagrangian points or on escape trajectories. Mars Express and Venus Express also took benefit of the versatility of the Fregat stage.

Stepped improvements of the upper stage were carried out to launch MetOp-A in 2006 and finally Giove-B in 2008. The last one is under qualification by NPO-Lavotchkine to comply with the deployment of the Galileo constellation by 2010 for the European Space Agency, applying the same winning formula: introduction of a launch vehicle upgrade through a launch services contract with Arianespace.

The paper will describe the successive steps of the Soyuz/Fregat launch system improvements according to dedicated mission requirements and the associated in-flight operations.

Capitalizing on the successful Soyuz/Fregat launch system improvements for complex missions, Arianespace has the capability to offer a wide range of solutions to both institutional and commercial customers from the Guiana Space Centre.