IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems (4)

Author: Mrs. Marie-Christine Bernelin
Dassault Aviation, France

Mr. Marc Vales
Dassault Aviation, France
Mrs. Elise Ballée
beyondgravity, Switzerland
Mr. Bruno Rodrigues
beyondgravity, Switzerland
Mr. Marc Dubois
S.A.B.C.A, Belgium
Mr. Tillo Vanthuyne
S.A.B.C.A, Belgium
Mr. DANIELE FRANCESCONI
Thales Alenia Space Italia (TAS-I), Italy
Mr. Roberto Provera
Thales Alenia Space Italia, Italy

CARGO AND CREW TRANSPORTATION TO LEO AND BEYOND

Abstract

A European space transportation system is proposed by a consortium of private companies, the main ones being Dassault Aviation, RUAG Space, SABCA and Thales Alenia Space Italia. It will enable cargo transportation to and from Low Earth Orbit (LEO) in a first step, then for humans in a second step. An incremental evolution to Geostationary Eath Orbit (GEO) and cis-lunar orbits is also proposed. The scenario is based on:

- Emergence of a space ecosystem in LEO and then beyond with commercial applications,
- A part of the foreseen activities requires human presence,
- A European will to have autonomous crew access to space,
- Safe omni-role space planes, offering flexibility and suitable for unmanned and manned flights.

The proposed scenario is based on development of a four-vehicle family, which originates from Space Rider. Architecture and most equipment are common to all vehicles. Increments are linked to operational needs for a European autonomous exploration programme. The first goal is LEO and finally GEO and cis-lunar orbit:

1. Development of a 7-10 ton class vehicle, launched on Ariane 62 or being co-passenger on Ariane 64 (in complement to Space Rider, launched by Vega C): first flight in 2026,
2. Transition to a 20-ton vehicle, requiring full Ariane 64 capacity: first flight in 2028,
3. Transition to a vehicle enabling manned flight in LEO (6-people crew), shape, dimensions and weight being identical to the previous vehicle: first flight with Ariane 64 in 2030,

4. Transition to a 50-ton class vehicle designed for manned cis-lunar flights. It could be ready to fly from 2034, the timing of the maiden will also depend on availability of a super-heavy launcher.