

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

Author: Dr. Sylvain Guédron
ESA - APT, France, sylvain.guedron@esa.int

ARIANE 6: FUTURE LAUNCHER CANDIDATES AND MATURATION PLAN

Abstract

The independent access to Space remains a priority for European member States in order to satisfy their needs in tem of institutional missions. Today this access to Space is guaranteed using ARIANE 5 Launcher, and very soon a launcher family with SOYOUZ and VEGA. Europe has a small number of institutional payloads. That led to invent the dual launch capability as an original operational scheme in order to satisfy institutional needs and offer commercial payload capability. For the long term, in order to prevent risks for independent access to Space, the analysis of a new generation launcher has been decided. Analyse are on going at national level, in parallel to ESA studies. A preparatory programme is called ARIANE 6 and is led by CNES. The aim and priority are to identify the most promising solutions that satisfy the institutional needs and minimise the overall exploitation cost for member States. ARIANE 6 preparatory programme is focused on the preparation of the next European Ministerial Council. For that, in-house launch system analyses are performed at CNES. These launch systems has to satisfy a performance range between 2T and 8T equivalent GTO considering a single launch strategy. Among the preferred concepts are: The so-called PPH (Solid/Solid/Cryogenic stages) using different number of strap on boosters, The so-called HH (Cryogenic/Cryogenic stages) using different number of strap on boosters and main engine derived from VULCAIN For all the architecture, the cryogenic upper stage is propelled by VINCI engine. Numerous studies have been performed with the support of industry in order to identify the solution minimizing the recurrent cost with a maximal robustness to environment evolution (market demand, market price, competition). Among these solutions the different aspects were analyses: - Staging optimisation in order to achieve the performance range and dimensioning - Identification of technology or technique issues - Modularity concerns in order to address the overall performance range at a minimal cost - Commonality concerns in order to reduce cost At the end of the study we are able the present the preferred concept for H and P configurations. This programme is supported by technology demonstrations to be developed and tested during the period 2010-2015. The technological demonstrations are defined through 3 main pillars: - Solid propulsion - Liquid propulsion focusing mainly on Cryogenic purposes - Avionics This paper will focus on the preferred concepts recommended and main technological demonstration preliminary results.