

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

Author: Mr. Jens Kauffmann
European Space Agency (ESA), France, jens.kauffmann@esa.int

Mr. Paolo Baiocco
Centre National d'Etudes Spatiales (CNES), France, paolo.baiocco@cnes.fr

Mr. Guy Pilchen
European Space Agency (ESA), France, guy.pilchen@esa.int

FUTURE LAUNCHERS PREPARATORY PROGRAMME (FLPP) – STATUS OF THE ESA NEXT
GENERATION LAUNCHER SYSTEM CONCEPTS

Abstract

The launch system concept investigations for the Next Generation Launcher (NGL) are part of the ESA Future Launchers Preparatory Programme (FLPP) which has the objective to prepare the technical and programmatic elements for making an informed decision on the best launch system to respond to the future institutional needs, while maintaining competitiveness on the commercial market.

The conception of the NGL is driven by the requirement to provide a highly flexible launch system with a wide range of performance and mission capabilities reducing the total cost of ownership for the ESA Member States which shall be available at the horizon of 2025. This flexibility is driven by the expressed needs to cover a performance range from 2 tons up to 8 tons in GTO covering institutional as well as commercial needs while being furthermore capable of performing missions into a variety of other orbits such as MEO, GEO, LEO and SSO.

Based on previous results the currently on-going activities concentrates on four selected NGL concepts only. The major objective of this slice of the system concept investigations is to optimise and consolidate selected NGL architectures and their design WRT performance, flexibility, and cost. For these investigations the required performance flexibility shall be achieved by using the same core configuration for the launch vehicle while providing the performance augmentation mainly by means of solid propellant strap-on boosters. Besides these baseline requirements the extension of certain system architectures for demanding institutional missions based on a Common Core Booster approach is being investigated as well. These investigations are being performed by an industrial team lead by Astrium-ST SAS as the prime contractor and consisting of further thirteen companies from nine ESA member states.

A different industrial activity performed by ELV SpA is in force since spring 2011 and addresses NGL concepts for a reduced performance range and various system architectures based on solid propellant for main stage propulsion.

A second important objective is to identify in parallel the critical technologies required by the NGL systems as well as to identify those technologies in support of launch system flexibility, reliability, but in particular reduction of exploitation cost.

This paper details the status and results of the industrial activities for the different launch system concepts, certain important design and technology trade-offs while a more exhaustive overview of FLPP technologies is provided in another paper.