

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

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A5 ME: TECHNICAL AND PROGRAMMATIC CHALLENGES

Abstract

The ESA Council at Ministerial level held in November 2008 decided to launch a preparatory Programme related to an evolution of the Ariane-5 launcher. This new version, dubbed A5 ME for Ariane-5 Mid-life Evolution, aims at fulfilling the future institutional and scientific needs while anticipating the evolution of the commercial market.

Ariane-5 ME features basically a new cryogenic re-ignitable upper stage powered by the Vinci expandable-cycle engine, and will rely on the present Lower Composite of the A5 ECA launcher. Thanks to the re-ignition capabilities, A5 ME will enable versatile missions such as MEO, LEO or Escape missions interesting for institutional and scientific payloads and will offer GTO+ or GEO mission capabilities to the commercial market. In addition, this version will increase the global performance of the launcher ensuring the GTO dual launch capability essential for the competitiveness on the commercial market.

The A5 ME master schedule is basically two-fold: Phase1 covers preparatory activities up to end of 2011 and then phase2 will be proposed for subscription at the next Council at Ministerial level planned 2011 for the development up to completion. Phase1 main objective is therefore to acquire the technical and programmatic maturity needed to decide the achievement of the A5 ME development, by performing and concluding the preliminary definition phase of this project.

This paper will provide a comprehensive overview of the configuration of the A5 ME launcher, in particular the new Cryogenic Re-Ignitable Upper Stage, and will present the development logic and associated main milestones with a specific zoom on the Phase1. This period will be, in particular, crucial for the Vinci engine whose development activities will be transferred from the ESA-FLPP demonstration into an Ariane-5 development frame.

Besides the technical challenges related to the re-ignition of a cryogenic upper stage, and the qualification process of a versatile launcher, the A5 ME project will present some new programmatic challenges. Indeed, according the Ministerial Decision of May 2003 on the Restructuring of the Ariane Launcher Sector, Astrium will be the Prime contractor for all the A5 ME launcher development related activities, including the propulsion. As a consequence, new relationships and new processes will have to be set up with the ESA Customer and the sub-contractors. This new organisation should also enable to improve the methodologies with respect to previous developments, taking benefit of Stages and System co-integrated activities. The Industrial organisation will be set up during this Phase 1, relying on the present Ariane-5 industrial network while ensuring ESA procurement rules best practices. Last but not least, industrialisation issues will be tackled very early from the preparatory phase onwards on the basis of dedicated new processes.