

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

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ARIANE 5 ECA PERFORMANCE IMPROVEMENT PLAN PERFORMANCE IMPROVEMENT PLAN

Abstract

The ARIANE 5 ECA launcher is the European workhorse. The current version, dubbed 'PA-2' was successfully qualified in 2009 in a generic way by ASTRIUM-ST within an ESA programme.

During the exploitation phase, ESA finances so-called "level 1" post flight analysis, based on flight measurement, that provide very important information on the launcher behaviour and its functional parameters at system, stages and engines level.

Beside these key information, some in-house analysis were performed at CNES and ESA but also at ASTRIUM, SNECMA and ARIANESPACE in order to identify some affordable improvement that could allow to increase the ECA.

The status beginning of 2009 was sufficiently promising to initiate a project called 'A5ECA Performance Improvement Plan'. The given target was to achieve at least 10 T performance equivalent single launch for GTO mission, by end 2010. With the Payload performance improvement plan achieved, ARIANESPACE will provide the adequate response to the new customer needs for the dual launch configuration, without any negative impact on the environment for the Payloads.

This paper will address the current status and main results obtained. It will focus on the technical description of the most promising selected options that will be qualified at launch system level. Among them are:

- Interface Flange deletion at upper part level
- Reduction of discrepancies for VULCAIN 2 and HM7B functional parameters based on post flight data analysis
- Optimisation of the VULCAIN 2 and HM7B mixture ratio within the qualified domain
- Improvement of the LH2 thermal residual mastering of the ESC-A upper stage
- System constraints release...

The corresponding expected payload mass saving will be given.