

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

Author: Mr. Daniel de Chambure
European Space Agency (ESA), France

ARIANE 5 ECA AND ES ON-GOING DEVELOPMENT ACTIVITIES INCLUDING ADAPTION FOR
GALILEO MISSION

Abstract

In view of the tightening of the conditions of the market for launch services, overall costs of exploitation and the evolution of the mass of the satellite, an increase in the capacity in launch double GTO of Ariane 5 ECA carrying his performance larger than 9,100 kg of payload in GTO appeared already in 2009 as an important factor for ensuring the competitiveness of the Ariane 5 ECA launcher. With regards to the situation, ESA undertook a performance improvement plan to reach above objectives. The plan was initiated in 2009 and has brought the Ariane 5 ECA performance today up to 10,100 kg. With the activities remaining to be done under this plan (MPS thrust law tuning; LVA 3936 development; ESCA thermal residuals step 2), the Ariane 5 ECA generic performance should be brought to more than 10,200 kg in GTO by end 2013 and possibly even higher with the use of OURS strategy (Optimisation de l'Utilisation de la Réserve Statistique) which consists in increasing the ESC-A depletion probability on the LOX side while the ESC-A flight reserve is defined in order to guarantee an overall depletion probability of maximum 1

In parallel, the Ariane 5 ES launcher with re-ignitable upper stage, currently used for the ATV missions will be adapted for the deployment of the Galileo FOC constellation. This launcher adaptation includes the development of a dispenser for carrying and separating 4 Galileo S/C, the redesign of the VEB structure for mass saving purpose thanks to loads decrease compared to ATV mission and some electrical and thermal modifications of the launcher for the long duration ballistic phase. This program initiated in 2012 is very challenging in terms of planning with regards to the first launch foreseen end 2014.

Concerning the shock environment of the payloads for both ECA and ES versions, ESA has undertaken activities to significantly reduce the shock level at S/C interface induced by the fairing horizontal separation system during fairing separation. Qualification activities will be completed by beginning 2013 culminating with first use in flight with ATV4 expected to take place in May 2013.

This paper will address the current status and main results of the performance improvement plan for Ariane 5 ECA and of the new fairing horizontal system, including latest flight results. Last but not least, the paper will focus on the development and qualification of Ariane 5 ES for Galileo FOC mission.