ABSTRACT

ARIANE 6 NEW LAUNCH PAD AT GUIANA SPACE CENTER: AN OVERVIEW

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The Declaration on the Programme for Ariane and Vega development has been subscribed at the occasion of the ESA Council at ministerial level CM-14, with an envisaged maiden flight in 2020. The main driver guiding this Programme is to ensure access to space for lowest overall costs (development and exploitation over a decade) for Member States, including the following objectives:

- Guarantee European independent access to space for European customers and in priority for all institutional missions,
- Make European launch services competitive for European institutional customers,
- Allocate responsibility to industry from design to exploitation provided that it leads to cost reductions in development and/or in exploitation,
- Maintain and ensure European launcher competence with a long-term perspective.

This Programme covers the developments of Ariane 6 and Vega C Launch Systems, including the P120C as common element to Ariane 6 and Vega C, and the preparation of the launchers evolution.

The Ariane 6 Launch System is decomposed in two sub-products, namely the Launcher System and the Launch Base. On this basis, two individual contracts were awarded by ESA for the development and qualification of each of those sub-products:

- With Airbus Safran Launchers (ASL), for the Launcher System development,
- With CNES (CNES/DLA), for the Launch Base development.

The selected Ariane 6 launcher is a modular configuration based on a Central Core with two cryogenic stages propelled respectively with an upgraded Vulcain engine and with a Vinci engine. The modularity is offered by:

- A modular Upper Part able to allocate single or dual Payloads
- Two or four strap-on boosters (SRM) in the class of 130 tons of solid propellant loading, common with the VEGA-C first stage.

The Launch Base for Ariane 6 consists of all existing, modified or new construction, facilities, equipment, services and software required, in Kourou or worldwide where relevant, for proper control of the flight, to support the integration, check-out, launch authorization & launch, telemetry, tracking, control & post flight analysis, maintenance and refurbishment of the Ariane 6 Launch System.

In this way, the Launch Range (BLA) existing facilities will be adapted for Ariane 6, and a new Launch Complex (ELA4) will be developed.

In addition to performances and delay, a very important goal of the program is to minimize the exploitation costs of the A6 Launch Base. To face these challenges, working methods have been introduced:

- CNES Engineering team is an integrated team gathering all ground systems, working in co-engineering sessions with Launcher teams, in order to consolidate interfaces with Launcher as soon as possible.
- BIM (Building Information Model) numeric models are used for facilities conception in 3D. The BIM is a structured and orderly compilation of information relative to a work of construction, serving to simulate its physical and functional characteristics. The BIM thus allows “to build” before construction, to simulate visually its integration, to optimize its costs (recurring and non-recurring costs), its schedule, its quality with a better management and risks minimization at a very early phase.

After a quick presentation of Ariane 6 Programme, this paper will describe the overall design of the new Launch complex ELA4. Its innovative features will be pointed out, as well as lessons learned from previous Launch Complexes developments made by CNES.