

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch Services, Missions, Operations, and Facilities (2)

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GROUND INFRASTRUCTURES SYNERGY BETWEEN THE LAUNCH PADS AT THE FRENCH
GUIANA SPACE CENTRE

Abstract

Today, the French Guiana Space Centre (CSG) accommodates three different launchers ARIANE 5, SOYUZ and VEGA, all operated by Arianespace. Besides the synergies which are naturally implemented at the exploitation teams level, the mutualisation of ground facilities is another challenge when sites are separated from several kilometres and whose construction spread out over a period of 20 years. The Ground Facilities Development Sub-Directorate of French Spatial Agency (CNES) is since the origin of the French spatial adventure responsible for the design, for the development, for the construction and for the qualification of the successive launch pads in Guiana. This continuity allows to have a global approach on the design and the sizing of production systems and distribution networks. While the location of new launch pads is driven by the "CSG master layout", the location of payload preparation buildings, control centres, launcher preparation buildings, stage storage buildings, high voltage network, chilled water production or cryogenic plants, led to strategic choices during the preliminary Program phases. These choices are driven by the maximum launch system flexibility and the development cost optimisation. The notion of recurring costs comes to add in these constraints today and it becomes a major driver for the new ARIANE 6 launch complex. When is it preferable to re-use former installations while new systems will offer lower maintenance costs ? What are the effects of threshold on the limits of a chilled water or gas networks ? Where do we place the cursor for the sub-systems growth potential while program budget is limited ?

The propellant production site is exposed to the same difficulties with the cadence increase and the change of Solid Rocket type. How to manage efficiently this transition without perturbing the Ariane 5 production cycle ?

This paper draws an overview of the main installations used by current launchers family in Kourou, details the strategy of facilities mutualisation between ARIANE 5, VEGA and SOYUZ launch pads, and mentions some open topics linked to the future launch complex ELA4 for ARIANE 6.