

ELM LAUNCH BASE FOR NEWSPACE LAUNCHERS IN FRENCH GUIANA

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Abstract: A lot of development projects of space launch operators for small payloads have been undertaken in the world in the last decade. Some of those systems have already entered the exploitation phase, such as Electron, others managed to perform their first launch, like Virgin Orbit. The whole tendency is based on the premise that there is a viable market for launching of smaller satellites individually with competitive prices with respect to the piggy back or rideshare schemas proposed by big launch services operators, such as Arianespace or Space X.

That generated a tendency to multiply the concepts of new launch complexes in the world and in Europe in the last decade, such as Andoya in Norway, Esrange in Sweden, Azores Spaceport in Portugal or German Offshore Spaceport Alliance,.... The new launch operators emerging in Europe in that process have a need for associated ground means to conduct their operations.

In that new competitive environment CNES has proposed its own concept of launch base for new European launch operators covering their expressed needs. It has been defined by comparison of the CONOPS of different launch operators, associated to the specific situation of French Guiana with respect to concurrent solutions. The article is describing the main hypothesis and tradeoffs for the launch base that will be physically located on the historic "Diamant launch zone" in CSG (French Guiana Space Center).

Some of these new launch systems are reusable bringing with that feature the new opportunities for launch cost reduction but also new requirements towards ground segment, typically for safety impacts of returning stages on the Launch Complex and Launch Range. Launch Operators have slightly different CONOPS and use diversified propulsion systems adding the complexity, yet the general logic of CONOPS is similar between them summarized by the need of dedicated Launch Zones and Preparation Zones. Those elements require certain interfaces with external systems and stakeholders that are common for all of them.

The notions of "common means" of the launch base, such as infrastructure, utilities which will serve for all launch operators, is introduced as opposed to the "specific means" that will be used by a particular launch operator. The digital configurability of Launch Base means will be implemented to improve the coactivity management. The performance of the launch base in that configuration is evaluated in terms of coactivity effect on the yearly launch rate capacity aiming to reduce the recurrent and non-recurrent costs. The strategies to optimize each step of launch base exploitation, to limit the unavailability, recurrent costs and environment impacts are presented as well as the elements of scaling up of that installation to foreseen target launch rate of CSG.

In conclusion the preliminary studies have confirmed the feasibility of economic launch complex for micro and minilaunchers, characterized by high launch rate capacity and high availability, able to coexist with big launchers.

References:

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