SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems Verification and In-Flight Experimentation (6)

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ALDEBARAN: A "SYSTEM" DEMONSTRATOR PROJECT FOR NEW GENERATIONS OF SPACE TRANSPORTATION, NOW ENTERING IN THE PHASE A.

Abstract

Aldebaran (IAC-08-D2.6.5) is the name chosen for a "system" demonstrator project which paves the way for one or more next-generation launch vehicle targets. The proposed demonstrator comes at a time when it is planned to operate existing European launch vehicles (ARIANE 5, Soyuz, VEGA) until around 2025, with no new generation launcher under development before 2015. The project is aiming at developing a flight demonstrator by focusing certain activities involved in the preparation of future launch vehicles. The first launch shall take place around 2015. It would represent an intermediate step prior to the development of a new-generation launch vehicle. Several Aldebaran concepts have already been analysed in the "phase 0" during 2008. A selection process have been applied taking into account the benefit of the proposed new technologies for the future launch systems, but also the interest of the partners for instance by taking advantage of research activities already foreseen. An other important selection criteria was the global development cost until the first technological flight. The result of this "phase 0" selection process will be explained. Three concepts have been retained for the "phase A": - An airborne solution launched from a military aircraft which will allow to build a dual stages expendable "system" demonstrator, involving the main technological innovations in the frame of the solid propulsion (first stage with new propellants), the liquid propulsion (upper stage with methane), the structures and materials, the avionics and more globally: the "system" activities. The work foreseen in phase A will not only focus on general studies for system and propulsion, but it will also concentrate on some first technological sub-system demonstration tests. - As a first alternative, an airdropped concept, launched from a cargo aircraft, is kept. It will mainly be studied regarding safety and operational aspects in addition with the "extraction" phase when the demonstrator is airdropped from the cargo bay, and has to be ignited at a safe distance from the aircraft. The technologies involved in this concept are identical to the previous ones. - As a second alternative, a "more conventional" vertical ground lift-off type of expendable solution is retained. The idea is to push as far as possible the technological choices for a "very

low cost" launch system, the propellant choices remaining "open". As for the airborne solution, general studies and sub-system demonstration tests will be addressed during the phase A.

The paper will present the result of the "phase 0" concepts selection process held in 2008. And it will show some of the first technological choices and demonstrations envisaged for the phase A of Aldebaran.