

SPACE PROPULSION SYMPOSIUM (C4)
New Missions Enabled by New Propulsion Technology and Systems (6)

Author: Mr. Jean Philippe DUTHEIL
Airbus Defence and Space, France, jean-philippe.dutheil@astrium.eads.net

PERSPECTIVES AND POTENTIAL INTEREST OF LOX/METHANE TECHNOLOGY FOR SPACE
VEHICLES ROCKET PROPULSION

Abstract

The importance of the propulsion technological heritage plays a large role when it is time to consider the type of propulsion applicable to a space vehicle to be developed: applying an existing and mastered rocket engine technology represents significant development risk mitigation.

However, it can also drive to limit the extend of vehicle improvement, and despite the large cost of maturing a new propulsion technology, innovative space vehicle (in term of mission or of economical performance) should be supported by the consideration of the best suited propulsion in a first approach, for identifying best choice against the application requirement..

Airbus Defence Space (former Astrium Space Transportation) has investigated; in recent years, advanced or new vehicles for access to space, for which the Liquid Oxygen / Liquid Methane propulsion technology appears to be a promising solution.

This is particularly true for Sub-Orbital Vehicles with crew and passengers, having together high safety objectives and strong economical constraints, in particular in term of low operating cost for which a high life-cycle capable rocket propulsion system (compared to classical Launch Vehicles) is one solution. But this technology also offers basic advantages for designing low-cost expandable propulsion systems, which of course have to be balanced with a lower engine performance (Isp). Other potential application domains are also identified in the paper.

This paper presents the overview of the assessment carried out by former Astrium-Space Transportation, now Airbus Defence Space, concerning the interest of Lox/Methane rocket propulsion technology for different vehicle applications. It features as well as the main investigation steps which have been undertaken for acquiring a first maturity basis in this technology