

## SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)

Enabling safe commercial spaceflight: vehicles and spaceports (3)

Author: Dr. Francesco Santoro  
Altec S.p.A., Italy

Mr. Alberto Del Bianco  
Altec S.p.A., Italy  
Dr. Nicole Viola  
Politecnico di Torino, Italy  
Ms. Roberta Fusaro  
Politecnico di Torino, Italy  
Prof. Vito Albino  
Politecnico di Bari, Italy  
Prof. Mario Binetti  
Politecnico di Bari, Italy  
Mr. Francesco Moretti  
Politecnico di Bari, Italy

ADVANCES IN ITALIAN SPACEPORTS IDENTIFICATION AS INFRASTRUCTURES FOR  
SUBORBITAL FLIGHT ACTIVITIES AND MISSION PROFILES**Abstract**

This paper elucidates some of the main operational and safety requirements for a commercial Spaceport with special emphasis to potential suitable sites in the Italian territory. The identification of the potential sites will be based on several factors, of which the safety is the first one. After the identification of the site/s, specific approach will be applied to assess what is needed to certify that specific site as a Spaceport, for supporting manned suborbital parabolic flights for both professional applications, like crew training or microgravity experimentation, and space tourism. Space tourism, in particular, seems to be quite promising in the future, due to the specific geographic location and climate characteristics of Italy. An initial set of Spaceport services will be analyzed too, aimed at the definition of a general functional model that can be applied to specific cases. Also, the approach to build up a regulatory framework to license a Spaceport and a Spaceplane in Italy will be evaluated, according to the national and EASA applicable regulation, with the purpose of setting up a national suborbital flights legal and regulatory framework, based upon the example of the FAA AST licensing system for Spaceports. This will aim at initially conducting experimental suborbital flights as a proving ground and, at the completion of this phase, more commercial activities could be planned, in the middle term, for executing Suborbital flights with paying participants and, in the long term, Commercial Suborbital Transportation. For simulation purposes, a preliminary feasibility study, executed for a private customer, will be considered, relevant to a manned VTOL Spaceplane, with four seats conceived to reach 100 km of altitude and experience a period of microgravity and an amazing view of the Earth. The mission profile simulations, developed for this Spaceplane, will be applied to the identified potential Italian Spaceport site and a preliminary feasibility study will be conducted to perform limited operations simulations of such a vehicle in the Italian territory. This will include spacecraft modeling, tracking, mission profile, ground track and debris fragmentation which is a paramount asset for a Spaceport, airspace utilization. Finally, technical feasibility of flying in the Italian territory an existing and more technically mature experimental vehicle will be considered, with special emphasis to horizontal takeoff and landing operations.