

SPACE OPERATIONS SYMPOSIUM (B6)
Human Spaceflight Operations (1)

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

Dr. Alessandro Bellomo
Altec S.p.A., Italy

Dr. Roberto Vittori

Colonel, Aeronautica Militare Italiana, Rome, Italy, Italy

Dr. Andrea Bolle
Sapienza University of Rome, Italy

THE ITALIAN SPACEGATE: STUDY AND INNOVATIVE APPROACHES TO FUTURE
GENERATION TRANSPORTATION BASED ON HIGH ALTITUDE FLIGHT**Abstract**

This paper summarizes the results of the pre-feasibility studies carried out in 2012 on the concept of sub orbital and hypersonic, high altitude flight in support of future generation transportation. Currently, while the High Altitude Flight is mostly instrumental to touristic purposes and emphasizes the so called Spaceports as futuristic, customers-luring airports featured with all the support services, the Spacegate concept deals with scheduled travelling in the upper part of the atmosphere between two points over the Earth surface, with significant reduction of the transfer time. The first part of the paper provides a theoretical approach to the matter, by proposing an “operational” mapping of the atmosphere as well as of the different kinds of flight occurring at High Altitude. The second part of the paper addresses the problem of the limited human capability of maintaining an active control of the vehicle during the re-entry phase and introduces the “Spacegate” concept as the conical portion of the atmosphere above the landing site, whose surface delimits the spiral-descending trajectories that the pilot can travel for a safe re-entry. This paper further outlines the results of the preliminary definition of top level operational requirements and derived architecture functional modules in support to the Spacegate implementation. Specific attention was given to the favorable geographic and climatic conditions of Italy that make this Country suitable enough for future experimental sub orbital flights and related operations. An initial analysis was performed on the regulatory backbone that has to be built to properly operate High Altitude Flight vehicles in Italy according with the concept of an Italian Spacegate. A Preliminary Master Plan/Road Map for the Spacegate has been laid out, with special emphasis to selected near term activities and support infrastructures necessary to be carried out to better refine the study in preparation to the unfolding of further future endeavors.