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Performance and technological feasibility of aerospace plane horizontal launch and landing with ekranoplane assistance

Numerous attempts to reduce the cost of satellites launch into a low orbit that were taken in many countries, characterize the current trend to make space projects economically viable and less costly. Unfortunately, this process has not led to a sharp decrease in the specific launch cost. The promising idea to make the launch cheaper is the transition from the vertical to the horizontal launch, which uses an air breathing engine. A simple method of expanding the velocity range for them was being developed by the use of boosters, gives Aerospace Plane (ASP) the aviation speed at which the main air breathing jet engine begins to operate effectively. Researches in the field of satellites horizontal launch (HTHL) were carried out in different countries. We will consider the project of launch system with ekranoplane as a booster for ASP and a mobile landing strip. This project was offered by N Tomita, Y Ohkami and A Nebylov in 1996 and since that time it has been developed in a view of detailed reasoning and various feasibility studies. Ekranoplane can give ASP the primary speed of Mach 0.6 in needed direction which allows to lower the requirements to ASP wing area and its engines. Some other advantages are connected with possible use of ekranoplane for ASP landing. Heavy ekranoplane is the single vehicle for implementing the innovative idea of docking of the descending ASP in the specific stage allowing to expand opportunities of its landing. The technology of ASP horizontal landing without undercarriage by docking with ekranoplane at the last stage of descent and the requirements of control systems are discussed.

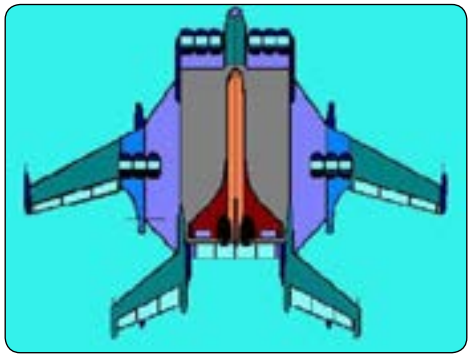

Figure 1: Ekranoplane with ASP aboard

Biography

Alexander V Nebylov has few Degrees to credit including: Title of the Honorary Scientist of the Russian Federation; Decree of the President of Russian Federation of 2006; Academic rank of Full Professor since 1986; Doctor of Science Degree in information processing and control systems since 1985. His scientific field of interest include: motion control theory, control systems and avionics. He the author of 18 books and more than 300 scientific papers and inventions, leader of many Research and Development in aerospace instrumentation. He is a Chairman of Aerospace Devices and Measuring Complexes, State University of Aerospace Instrumentation in Saint Petersburg and Director of the International Institute for Advanced Aerospace Technologies, Russia. He is a Member of the leadership of the IFAC Aerospace Technical Committee since 2002.

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