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New Space Operations Concepts and Advanced Systems (2)

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ORBITAL SERVICE SPACECRAFT "SERVISER"

Abstract

The orbital services market is young and fast growing. This, for the time being, means the absence of fierce competition in comparison with such business areas as launch services, space communications, remote sensing of the Earth, where other countries and companies have strong competitive advantages. Ukrainian scientists and engineers have a wide range of competencies related to the creation of orbital service vehicles. Moreover, a preliminary design of such a device has been developed and its modules are being tested. Preliminary economic calculations show the realism of possible costs for the creation of the Service Provider, as well as the rapid possibility of commercialization, which creates the conditions for attracting private investment to finance the project. In all cases, the solution to the problems of orbital maintenance is associated with the need for the service spacecraft to perform such operations in space as rendezvous with uncooperative client vehicles or space debris, their capture / docking with subsequent interorbital transportation. The tendencies of the approach to creation of designs of the spacecraft adapted for service in an orbit are considered. The forecasted volume of orbital service operations by types of service and by orbits is given. Information on key players in this market is provided. The design of the Service Provider, which is being developed by JSC RPC "Kurs" and SDO "Pivdenne" for the provision of orbital transport services, is given. Features of its construction as a whole and structure of modules, and also possibilities of the further expansion of functionality of the Servicer are specified. A combined optical-radar scheme of the "AZIMUT" rendezvous equipment is proposed, which ensures the rendezvous of the service spacecraft with the spacecraft with its subsequent capture and fixation. The competencies of Ukrainian enterprises in this direction are analyzed. The expediency and possibility of development of the direction of orbital service for further development of near space are substantiated, the developments of the Ukrainian enterprises on development and manufacturing of systems of convergence and docking of spacecraft are considered. The scenario of interaction of the space service device and the client device in orbit is described.