SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch Services, Missions, Operations, and Facilities (2)

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LAUNCH OPPORTUNITIES OF JSC SRC "PROGRESS" FOR PIGGYBACK PAYLOADS

Abstract

The opportunities to launch small satellites using launch vehicles by JSC Space Rocket Center "Progress" are presented. SRC "Progress" is the world leader in the number of launches of carrier rockets. In 2015 17 "Soyuz" family rockets were launched from Baikonur, Plesetsk and Guiana Space Centre. To date the family of the world-known Soyuz launch vehicles is represented by six medium- and light - lift carriers. These are well-established Soyuz-U, Soyuz-FG, Soyuz-2-1a, Soyuz-2-1b carriers. And finally there is a new light-weight Soyuz-2-1v that significantly increases competitiveness of SRC "Progress" in Russian and international market of small satellites launch services. This launch capability can be used effectively to launch piggyback payloads. Soyuz launches become truly versatile carriers when assembled with the Volga Upper Stage. As a component part of Soyuz-2-1a, -1b and 1v, Volga Upper Stage enables placing payloads into low circular orbits up to 1500km and solar-synchronous orbits with altitude up to 850km. SRC "Progress" has developed a new CubeSat deployer that adapted to the launch vehicles, spacecraft and upper stage manufactured by the SRC "Progress". Advanced modular design of the CubeSat deployer allows building a deployer for any type of CubeSat: from 1U to 3U+. Tried-and-true elements of high reliability level are used in the deployer that ensures the reliability of the deployer and the safety of the primary payload. Special attention paid to reducing the tip-off rate of the separated CubeSats. The simplest and most cost-effective way to undertake short-term scientific experiments utilizing Soyuz family rockets is using the free volume in the payload adapter. In the payload adapter can be placed up to 20 kg of the additional payload. It would be CubeSat deployers or non-separable scientific pods. Orbital parameters of the separated satellites correspond to the working orbit of the upper stage of the launcher: near circular orbit with an altitude of about 200 km. Micro and nanosatellites can be carried into orbit as a piggyback onboard the Volga Upper Stage. On the payload adapter can be installed CubeSat deployers by the SRC "Progress" or by other manufacturers. The Volga Upper Stage is a most suitable platform for launching small satellites. The CubeSat deployers can be placed on the satellites developed by SRC "Progress". Operational orbit of the Bion-M/Foton-M type spacecraft is a near circular orbit with an altitude of about 450-580 km. In 2013 five CubeSats were successfully separated from the Bion M1 satellite.