Piggyback payloads on the launch vehicles by JSC RSC Progress

Lipatnikova Tatjana

Space Rocket Centre PROGRESS

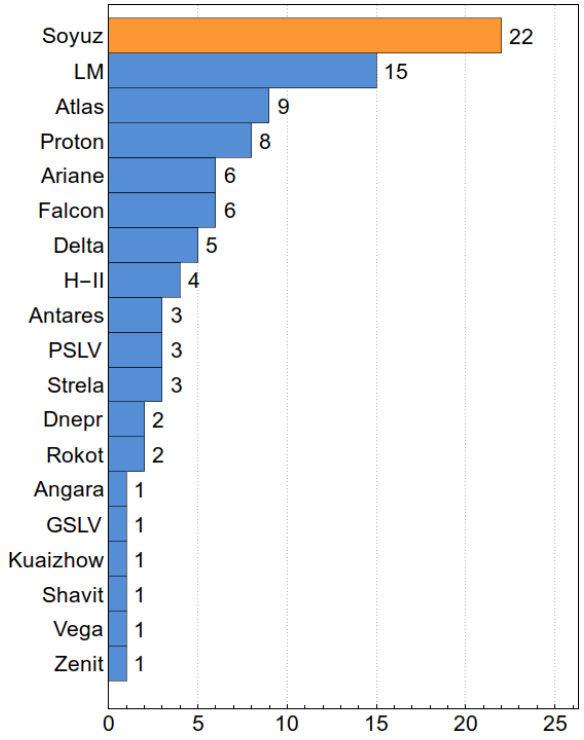
The PROGRESS Space-Rocket Centre Joint Stock Company (JSC SRC Progress) is a leading Russian enterprise and one of the world's space industry leaders, providing launches from 4 launching sites.

Over 20 thousand highly skilled employees are occupied at the SRC Progress.

The employees of the enterprise have created the Soyuz launch vehicle family, Earth remote sensing satellites and the Volga upper stage.

Space Rocket Centre PROGRESS

Launches performed in 2014*



- SRC Progress performs up to 20 launches a year.
- As of today more than 1,840 launches have been performed.
- Over 140 automated spacecraft have been launched under agreements with foreign customers since 1975.

* : Launches of Satellites in 2014. SRC “Progress” JSC, Scientific Department

Launch Vehicles

Soyuz-FG

Soyuz-2-1a

Soyuz-2-1b

Soyuz-ST

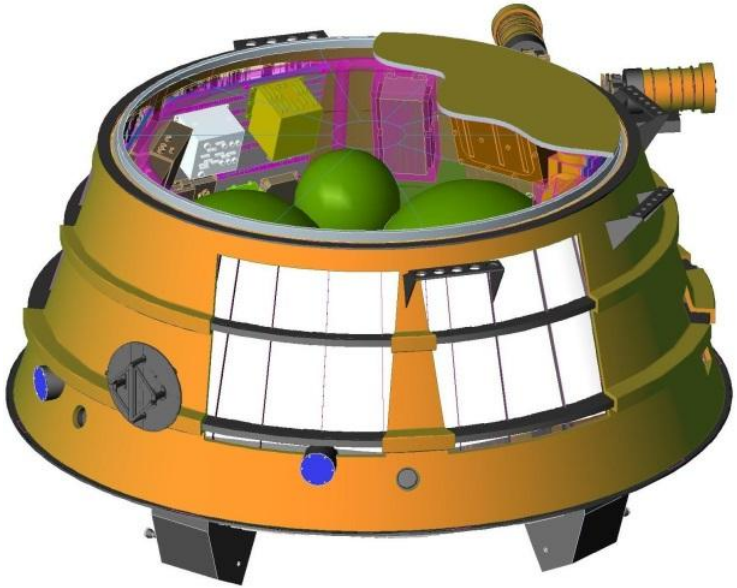
Soyuz-2-1v

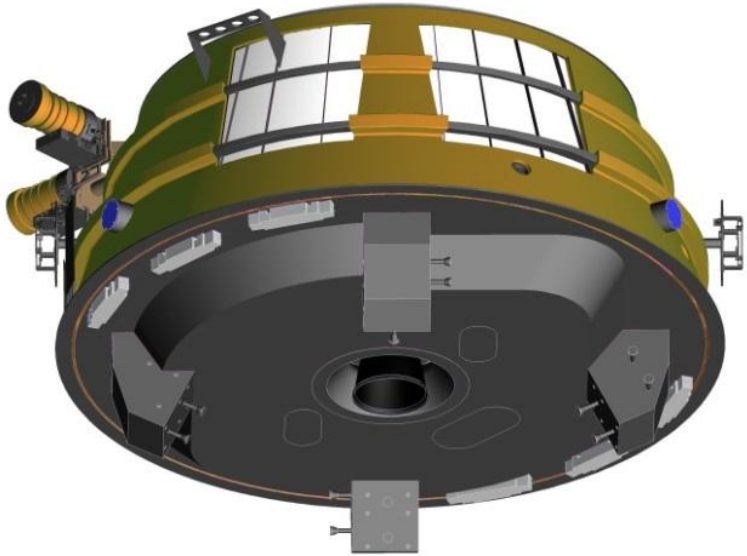
Soyuz's success factors consist in the reliable design, proved manufacturing technique, high skill of employees, and efficient system of quality control at every step of manufacturing and operation. The potential of the Soyuz launch vehicle enabled the enterprise to develop its multiple modifications.

Volga Upper Stage

Launch vehicles: Soyuz-2-1a, -1b, and -1v

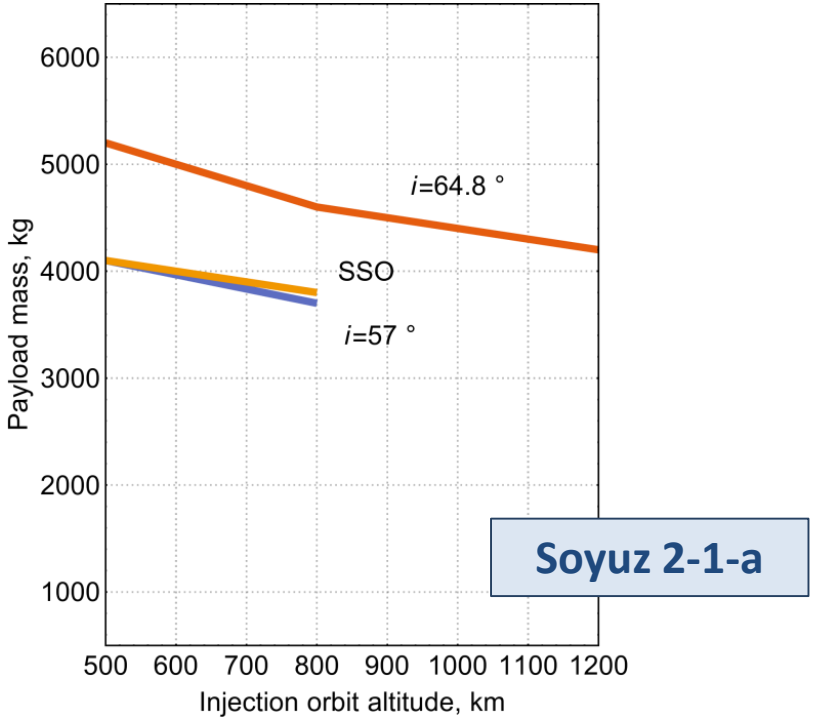
Capacity LEO: up to 1,500 km
SSO: up to 850 km

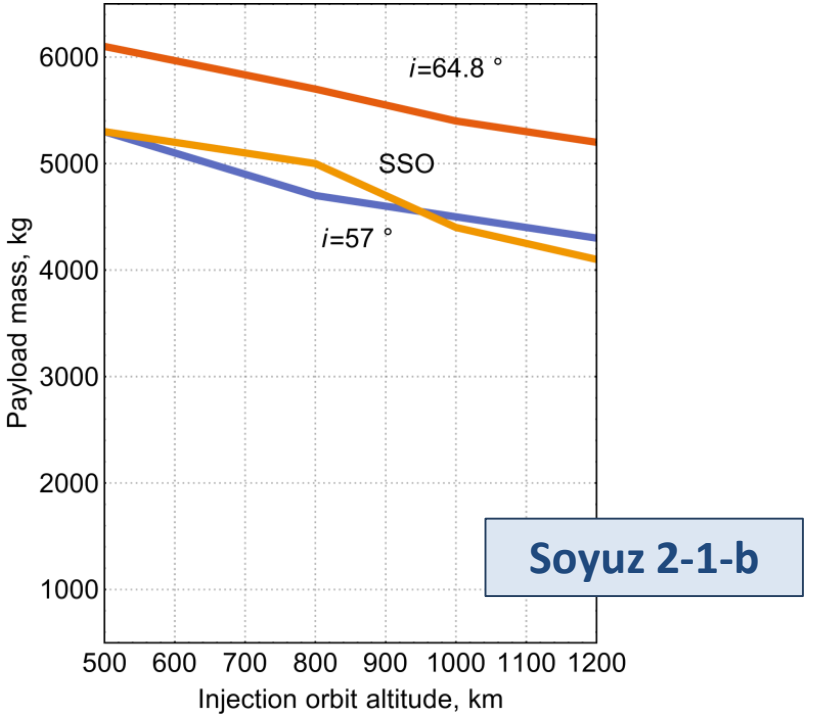




Soyuz-2 + Volga Upper Stage Performance

Vostochny cosmodrome



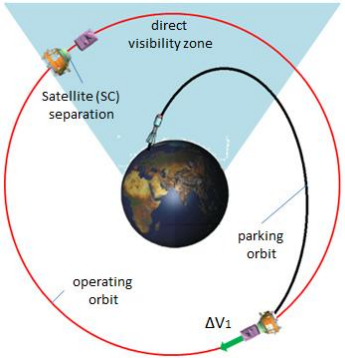


Payload Standard Injection Scenario

Injection from a Closed Orbit

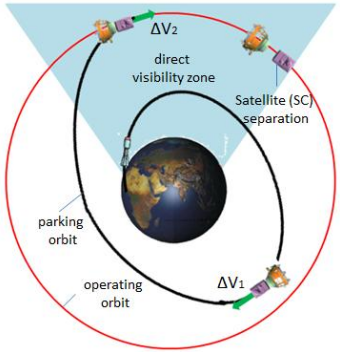
Single-burn injection pattern

Time before Main Engine ignition – at least 30 min
Main Engine burn time (ΔV1) – up to 500s
Time from the Upper Stage separation from LV to Payload separation – 60 to 120 min



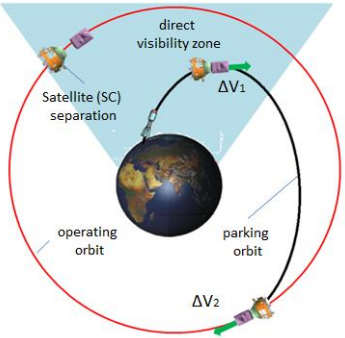
Double-burn injection pattern

Time before the first burn of the Main Engine – at least 30 min
The Main Engine first burn time (ΔV1) – up to 500 s
Gap between the Main Engine first and second burns – 30 to 110 min
The Main Engine second burn time (ΔV2) – 50 to 290 s
Time from the Upper Stage separation from LV TO Payload separation – 60 to 120 min

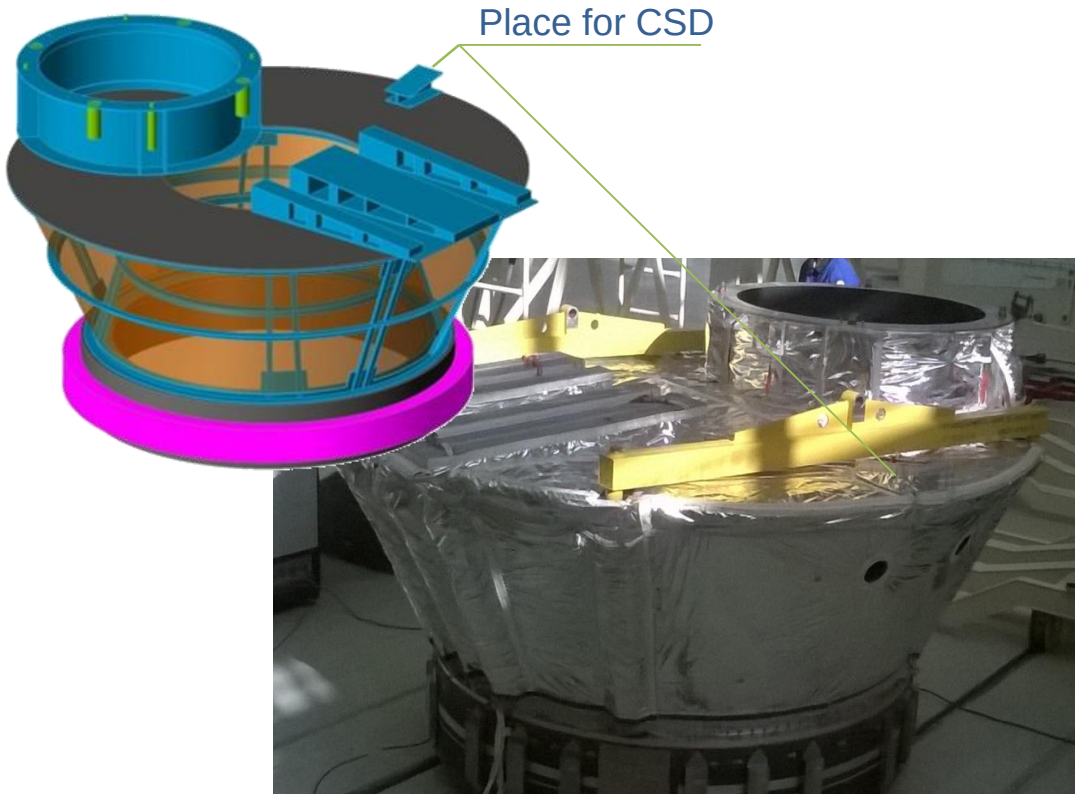


Injection from an Open Orbit

To avoid uncontrollable reentry of the LV upper stage, Payload is injected into an open orbit according to the scenario with the delta-V maneuver.
The Payload is transferred from the open orbit to the target orbit using the double-burn injection pattern. The ME first burn is done in 200s to shape a parking orbit with an apogee equal to the altitude of the target circular orbit, and perigee of at least 180km. Then, the target circular orbit is shaped with the second burn done in the apogee of the parking orbit.
Time from the Upper Stage separation from the LV to Payload separation makes from 60 to 120min.



Injection of Piggyback Payloads from the Volga Upper Stage Adapters

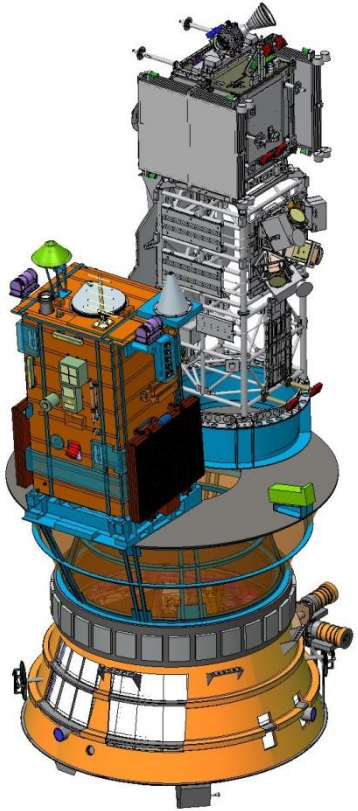


It is practical to place small satellites into orbit within a single mission.

The small satellites are arranged in the payload area under the fairing on the adapter. The following challenges are met:

- The CoG characteristics are guaranteed throughout all the legs of flight;
- The small satellites are separated from the adapter without impacts.

The First Launch from Vostochny



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JSC SRC Progress

invites you for cooperation!

www.samspace.ru e-mail: mail@samspace.ru
tel.: +7(846) 955-13-61 fax: +7(846) 992-65-18