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Russian Space Program: financial state, current plans, ambitions and cooperation with the United States

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Russian Space Program: financial state, current plans, ambitions and cooperation with the United States

1. Russian space budget

Russian space budget is better explained in dollars for three reasons. First, Russian national currency ruble is significantly less stable than US currency. Second, most people in the West have no or little understanding of the prices expressed in rubles. Third, the dollar value of the Russian space budget reflects the real buying power of the Russian Federal Space Agency Roscosmos, since Russian has to purchase from 80% to 90% of electronic components from foreign suppliers who won't sell them to Russia other than for hard currency.

Russian space budget in 2014, with the exchange rate of 33.4 rubles per dollar was almost \$5 billion, which constituted about 28% of the NASA FY2014 budget. In 2016, after Russia was hit hard by dropped oil prices and sanctions imposed against it by the Western powers, after ruble lost half of its value (66 rubles per dollar) and after Roscosmos budget was severely sequestered because of the general worsening of economic situation in Russia, the Roscosmos budget shrunk to just \$1.6 billion, what constituted only 8.5% of NASA FY2016 budget.

According to official data presented by State Duma, 52% of Russians make less than \$3,000 per year and 10% of them make less than \$1000.

(Hereafter all the estimates of the dollar value of the Russian space budget will be made based on 66 rubles per dollar exchange rate.) Russia plans to increase it

space budget up to \$1.9 billion in 2017, which would amount up to 10% of NASA budget projected to 2017, and up to \$2.16 billion in 2018, which would constitute approximately 11% of NASA budget projected to 2018.

In 2014, Oleg Ostapenko, former Roscosmos general director projected allocation of **\$64 billion** for the Russian Federal Space Program (FSP) for 2016-2025 time period. In 2015, this amount of money was reduced to **\$27.3 billion**, but what Roscosmos actually got in 2016, for 2016-2025 time period was just **\$21.3**

billion. Yuri Koptev, former first general director of the Russian space agency in 1992-2004, and current member of the Technical-Scientific Council at Roscosmos indicated that the Russian space budget could be cut even more.

One of the plagues of the Russian space program is corruption in the national space industry. Here is just one example: according to Russian mass media contractors and subcontractors stole up to 16 billion rubles (\$242 million) during construction of cosmodrome Vostochniy, which is up to 13% of the total amount of money spent on Vostochniy (\$1.8 billion) from the first day of its construction to the first launch from it which took place on April 27. According to Russian media the amount of stolen money could significantly hamper further development of Vostochniy.

2. What does Ruscosmos intend to do with the money it currently has in its budget?

In 2014, Roscosmos plans included:

- To develop 'super-heavy' LV to be launched from Vostochniy
- To develop 'robot-cosmonaut' to assist Russian cosmonauts during EVAs
- To test new human spacecraft
- To build and start operating a 'system to influence asteroids', comets' and space debris' flight trajectory'
- To develop and build experimental support machines for the future human Moon landing

These plans were modified in 2015, when the Russian government considered two variants of the FSP 2016-2025.

The first variant was supposed to include:

- Full scale deployment of satellite constellations including communication and Earth observation satellites
- Full financial support for space science
- ISS operations, including science research onboard the station

This variant, however, left no money for the development of new human spacecraft, control infrastructure for deep space activities, on-orbit satellite maintenance system, moon base and super-heavy LV

The second variant was supposed to include:

- Launching minimum necessary amount of communication satellites
- Deployment of Earth Observation satellites and support to fundamental space research

- New scientific and general use spacecraft would be built with 2-5 years delay
- Number of Progress spacecraft launches would be reduced from 4 to 3 per year
- Development of new spacecraft
- Initial development of super-heavy LV
- Development of LV up to 38 metric tons capacity
- inter-orbit space mobile units for human fly-by Moon mission

Finally, Russian government and Roscosmos opted for a second, albeit somewhat modified variant. They decide to make the main emphasis on the applied space activities, not on the Moon and deep space exploration.

It is necessary to take into consideration, while analyzing Russian space activities, that information about what Russia's space plans is often sketchy and contradictory for three reasons. First one is traditional secrecy surrounding these plans. Second reason is constant alteration of these plans because of lack of Russia's clear long-term strategy in space aggravated by the fact that none of those officials who are in charge of Russian space program have any space background. Deputy prime-minister Dmotriy Rogozin is a professional journalist and current President of Roscosmos State Corporation Igor Komarov is a former chairman of the car factory. Besides, unlike in the Soviet Union, Russia doesn't advance any of its political, economic or national security interests with the help of the civil space program. Third reason for the lack of clear picture reflecting Russian space activities is unstable economic situation in Russia.

For example, Komarov, Roscosmos President, said that by 2026:

- the number of Russian relay satellites in orbit will increase from 3 to 9
- Russia will launch 44 new communication satellites and
- 43 new Earth observations spacecraft

As a result, according to Komarov, Russian satellite constellation, providing that certain number of spacecraft will be decommissioned, will increase from 49 to 73 spacecraft through 2025. On the occasion he said that Russia plans to launch 180 satellites through 2025. Which number is closer to reality remains to be seen.

As about ISS, current plans envisage its operation through 2024. New modules with autonomous flight capacity will be added to the station.

Angara-5 heavy lift vehicle was supposed to start operations from Vostochniy around 2017-2018. However, its operation from Vostochniy was postponed to 2021, and beyond. Roscosmos doesn't even build a launch pad for Angara in Vostochniy since the booster is supposed to launch human spacecraft in space which design and configuration are not know yet. Same situation is with Russian spacecraft "Federatsiya" (Russian version of US spacecraft Orion). It was conceived in 2009, it was supposed to make first unmanned spaceflight in 2017 (postponed to 2021), be ready for fist manned mission in 2024, for Moon mission by 2028 (postponed to 2035) etc.

3. What are Russia's space ambitions? (moon, space station etc...)

Over the last few years there was a lot of talk in the Russian government and highest echelons of the national space industry about flying to the Moon,

eventually building a Moon base, sending human mission to Mars, developing so called transport-power module (space tug), building national, high latitude space station etc.... They turned out to be just talks apparently aimed at the creation of impression inside and outside Russia that the country continues to be a 'great space power'.

Moon mission was postponed from 2050 to 2035. As about international cooperation in space, just by looking at the two main space documents underlying Russia's space activity, called "Russia's Space Activities for 2013-2020," and "Basic Guidelines of the Basis of the State Policy of the Russian Federation in the Field of Space Activity through 2030 and beyond", one can easily make a conclusion that Russia is literally BEGGING for international cooperation. Both of these documents envisage Russia advance in the area of human spaceflight beyond LEO only as a member of some international team. Russian space enterprises were encouraged by Roscosmos to continue developing Moon lander and 'heavy oxygen-hydrogen space tug' by using their own funds.