



Alexei Krasnov

## MANNED SPACE FLIGHT HAS ALWAYS BEEN AN ARENA OF POLITICAL RIVALRY

**Security Index editor-in-chief Vladimir Orlov spoke with Alexei Krasnov, head of the Russian Space Agency's Manned Programs Directorate.<sup>1</sup>**

**SECURITY INDEX:** Alexei Borisovich, what are the government's main tasks in the area of space research at present, particularly those for which your directorate has responsibility—manned flight? Is international cooperation in this “sensitive” sphere progressing smoothly?

**KRASNOV:** Manned space flight has always been an arena of political competition, competing ambitions, and competition in the sphere of science and technology. It is not surprising that in the early stages of man's opening up of space, the United States and the Soviet Union were carried away by the competition in man's exploration of near-earth space.

In the near term (by 2015), the most important goal in space exploration will be the completion of the program to create, maintain, and use the International Space Station (ISS). The international partners in this program, as is well known, are the United States, Russia, European Space Agency partner states, Japan, and Canada. Solving the tasks that have been set requires all of the partners actively to fulfill their international commitments.

At the beginning of the process of creating the ISS, we, the Russians, were very optimistic, believing that we could build the station in five years. But certain unforeseeable problems arose that got in the way: on our side, there were delays in the construction of the first station components; later, the space programs of our U.S. colleagues stopped for three years due to the *Columbia* shuttle catastrophe.

Now we are switching to yet another modification of the station—already more than the twelfth—for which components are supposed to be finished in 2010. During this period our vision of what this station should look like has had to change. We realized that the composition of the Russian segment should be different. We reduced our “appetite” where the size of our segment was concerned and developed a program for the modernization of the module, in order to obtain the maximum amount of useful capacity for scientific programs.

At present, our ISS partners' plans are to operate the station through 2016. Originally, we assumed that the station would operate for 15 years, and 2016 really “marks” the end of 15 years of the existence of the service module that is the foundation of the orbital structure. In many respects the current assembly stage depends upon our colleagues, on shuttle flights. It is very possible that we will soon begin discussions on extending the service life of the station until 2020, at the very least.

As for technological exchange, I would like to say that the picture of cooperation on the ISS is not without problems at present. The worsening international situation of recent years and the threat of terrorism provoked the stiffening of U.S. legislation and many issues in the sphere of manned space flight are now considered to be military issues. This includes the space shuttle system—the system by which people are transported into orbit.



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I would like to emphasize that any serious cooperation in space is unavoidably tied to the question of the observance of the regime controlling the transfer, proliferation, and use of technologies that can be used for the production of delivery vehicles for weapons of mass destruction (WMD). The nature of outer space exploration is dual-use, since research results can be used both in the military and in the civilian spheres.

International space cooperation will undoubtedly be developed, but only with the understanding that the means to deliver crews into orbit can also be used to deliver weapons into space. Communications satellites are of course a key component of C-3 systems (Command, Control, and Communications), without which it is impossible to imagine a modern theater of war. The GPS system and Russia's GLONASS system are first and foremost elements of national defense systems. The same can also be said of high-resolution meteorological surveys of the earth's surface. Therefore, international cooperation will be developed, but questions of the protection of sensitive information related to WMD delivery systems will always be on the agenda.

**SECURITY INDEX:** At the present time, what is Russia's role in the construction of the ISS?

**KRASNOV:** Russia's role in the implementation of the program is steadily growing. Russian *Soyuz* spacecraft may become the only remaining means to transfer crews to and from the ISS. This is due to the fact that the U.S. National Aeronautics and Space Administration (NASA) must ensure the inclusion of European and Japanese research modules in the composition of the ISS by 2010, as well as an increase in the number of permanent ISS crew from three to six people. After this, NASA plans to end shuttle operations. But a new American manned spaceship will not be created earlier than 2013-14.

Under this approach, *Progress* cargo ships—which deliver cargo to the station—will also take on an increased load. At present, negotiations are under way between the Russian Space Agency (Roskosmos) and NASA on the United States' possible acquisition of Russian services for the delivery of crews and cargo for the ISS program.

Russian responsibility is also growing due to the U.S. President George Bush initiative,<sup>2</sup> which will influence the fulfillment of existing agreements. This is, primarily, true in a purely material sense, since the initiative will require significant expenditures. These resources were in part found through the reduction of ongoing programs. Naturally, the ISS program was also affected, but the greatest influence over the execution of the program, I emphasize again, was made by the decision to terminate shuttle flights in 2010. We hope that over the long term, despite the exclusively national nature of the initiative, it will allow us to use the fairly in-depth experience of international cooperation within the framework of the ISS program.

**SECURITY INDEX:** How are the United States' partners in the project reacting to the developing situation? And how is Russian cooperation with project partners other than the United States?

**KRASNOV:** The European Space Agency (ESA) is concerned by the developing situation and has voiced serious interest in cooperating with Russia on the operation and targeted use of the ISS. For example, under the ISS program joint Russian-European designs have already been used to equip the *Zvezda* Russian service module with the European DMS-R data management system as well as integrate the Russian ISS segment with the European Automated Transfer Vehicle (ATV) cargo carrier and the European Robotic Arm (ERA).

In addition, intensive Russian-European consultations are currently under way on the possibility of the joint creation of a next-generation transport system to ensure the transport of crews and cargo to the ISS. It has been proposed that over the long term this system should ensure the implementation of programs for research and exploration of the moon, and later, possibly, Mars. The first stage in the creation of such a system could be the comprehensive modernization of the *Soyuz* and *Progress* spacecraft in order to undertake the tasks that have already been set. Europe is also interested in the possibility of operating the new system from the European launch site in Kourou (in French Guiana, South America).

The joint development of a next-generation transport system and its subsequent operation is a very complex matter for both parties, since it requires the thorough harmonization of technical, organizational, legislative, and other matters, as well as resolving the issue of the allocation of significant funding. At the same time, both parties must be clear on the tasks this system will

undertake, what requirements it must satisfy, and so forth. For this reason, a decision on joint development will not be made earlier than 2008.

Several joint Russian-European experiments are being conducted on the Russian segment of the ISS. Under an agreement with Roskosmos, during a visit to the Russian segment of the ISS by ESA astronauts, six European research programs, including over 100 experiments as well as the long-term flight of European astronaut Thomas Reiter as an expedition member counted under the Russian quota for ISS crew, were conducted.

At present, Roskosmos and ESA are working out joint programs in biomedical and physics research on the ISS as part of the ISS-15 through ISS-18 expeditions. The areas of research of greatest mutual interest have already been determined.

In addition to cooperation with ESA, Roskosmos and a number of Russian enterprises are cooperating directly with the European national space agencies and large private European corporations. As an example, one can point to the draft Russian-French research program and possible programs on space exploration, drawn up by Roskosmos and France's National Center for Space Studies (CNES).

The Russian segment of the ISS has also undertaken a number of experiments for the Japanese Aerospace Exploration Agency, as well as for a number of private Japanese companies. This primarily involved research connected with the cultivation of protein crystals, and taking videos with the aid of high definition television cameras.

**SECURITY INDEX:** We are basically talking about flights in near-earth space. But how about flights to other planets or, at least, to our nearest "neighbor," the moon?

**KRASNOV:** Interest in the study of the solar system and deep space, and in the prospect of manned missions to the moon and Mars in particular, heated up to a considerable degree after the statement by Bush at NASA headquarters on January 14, 2004, when he made public the new U.S. concept for the exploration of outer space. The plan, in particular, calls for manned lunar missions by 2020. The moon will be used as a base for manned flights to Mars, which are planned for some time after 2030. In the past three years, NASA has generally determined the architecture of space infrastructure for a lunar mission and the design of the Crew Exploration Vehicle (CEV), and begun its development.

The global community of space researchers is interested in these new plans. NASA has proposed to all interested parties that they determine their capabilities to participate in the implementation of this program. Moreover, here we are talking exclusively about a partnership, not about fulfilling U.S. contracts. One should take into consideration that NASA's budget exceeds the combined budget of other participants in space activities by several times; therefore, its international partners are justified in expressing fears that their potential partnership with NASA can not be on an equal basis. In fact, the United States has confirmed this, by openly stating its new space doctrine in 2006, already mentioned above, where it unequivocally declares the priorities of U.S. national interests in any space projects, as well as the U.S. intention to limit the access of "undesirable participants" to the space programs. For these reasons, its international partners are not yet hurrying to join the American initiatives.

**SECURITY INDEX:** So are Russia and other countries currently remaining on the sidelines in this sphere?

**KRASNOV:** Russia is proceeding from the fact that manned lunar missions and the creation of an inhabited lunar base could ensure the rise of the domestic rocket industry to the global technological level. Such flights will give Russia the chance to claim a leading position in international space cooperation, including in the area of ultradistant radar detection of asteroids and comets, in conducting unique astronomical and astrophysical observations outside the atmosphere, and in developing and using advanced technologies, including the full-scale development of promising space technologies.

Russian research on the planets (primarily the moon, Mars, and Venus) and small bodies of the solar system with the aid of unmanned spacecraft has been conducted since the 1960s. Important results have been obtained and unique experience and scientific and technical



knowledge accumulated in the creation of critical elements and systems for the research and exploration of the planets in the solar system. In the area of Russian manned space research, the priority is the creation of lasting manned orbital complexes and providing for prolonged (up to one-and-a-half year) human life and work during space flight. The accumulated capabilities are also of interest to our international partners.

Thus, the Europeans have expressed interest in cooperation with Russia under the European *Aurora* program aimed at exploring the solar system. Russia and Europe are in agreement that, first of all, ISS construction must be completed in the agreed-upon configuration to ensure the complete fulfilment of plans for research and experiments to get answers to many questions related to the further development of manned space flight, to work out particular technical solutions, and to confirm and demonstrate their operability. Furthermore, manned missions to the moon and Mars must be preceded by a fairly long period of research of these planets by unmanned systems from orbit and on the surface, in order to finalize (including in near earth orbit) the basic technical solutions and structural elements of space systems, as well as in order to select the optimum sites to land crews both from the point of view of safety and scientific worth. Russian and European experts are actively cooperating in the preparation of these robotic missions, which will precede the manned expeditions.

The idea of developing a joint Russian-European program to prepare for and realize manned research of the moon and Mars would also make sense. This will require the formulation of goals and tasks for each stage that are tied to real timelines and funding capabilities.

China has also shown significant interest in cooperation with Russia in the field of lunar research. At present, Russian and Chinese experts are analyzing the possibilities for a joint manned lunar mission.

As for a Martian program, its realization requires such enormous technological, economic, and intellectual resources, that not one country can carry it out on its own. Basically, the joint capabilities of the United States, Russia, Europe, Japan, and China make it possible to consider a manned expedition to Mars in first half of the 21<sup>st</sup> century realistic, if the efforts of various states are joined together and they fulfil the obligations they have undertaken.

Russian experts estimate that full-scale study and exploration of the moon can begin no earlier than 2020-25. Furthermore, many questions related to the reasons for putting men on the moon and other space objects, as well as their goals and tasks, remain open. We are ready for the closest cooperation with international partners to resolve these and other problems on a mutually beneficial basis.

**SECURITY INDEX:** As you have already said, space research is an arena of interstate competition. Nevertheless, recently some private companies have made their own launch attempts. How do you react to this course of events?

**KRASNOV:** I think that there are undoubtedly prospects for private space research. Space and space technologies are very complex technologies, and many, as a rule, begin with failures, but this should not be discouraging. Those companies that have already operated in this area for several years have the best initial potential. Suborbit (the arena of near-earth flight) represents real interest to business. By the way, almost no one knows it, but Russia is also working on this albeit, unfortunately, with the participation of foreign, not Russian, private capital. However, we should always keep in mind that this sphere is doomed to remain the subject of very close attention on the part of the relevant state agencies that are called upon to maintain controls over such sensitive things. 🐜

## Notes

<sup>1</sup> This interview is based on an address by Alexei Krasnov, head of the Russian Federal Space Agency's Manned Programs Directorate, at a meeting of the Dialogue club held by the PIR Center on April 10, 2007.

<sup>2</sup> This refers to the National Space Policy, a conceptual document on U.S. space policy signed by George Bush in 2006. The document, in particular, envisions that in future Washington will not sign agreements that may limit its plans in space, and that it will attempt to limit the access of "hostile" forces to space.