

## CHAPTER 2

### THE RUSSIAN FEDERATION'S PRIORITIES IN THE FIELD OF EXPANDING INTERNATIONAL COOPERATION IN THE USE OF OUTER SPACE

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As of 2005, over 130 countries are actively involved in the conquest of outer space, a new area of human activity. International cooperation in the peaceful exploration and use of outer space is growing. Modern space science has opened up new opportunities to effectively address the global problems facing mankind, including the most important of all: ensuring international security. At the same time, it is not making full use of the most up-to-date equipment and advanced technology, which could be used extensively in space activities by the world community with the aim of addressing today's global problems such as:

- ensuring comprehensive international security;
- protecting the environment; and
- ensuring socio-economic development.

From the first years of the space age, the Russian Federation opted for the extensive use of outer space through international cooperation. Flights by foreign cosmonauts on Russian spacecraft and space stations, the Apollo-Soyuz Test Project, international collaboration in operations on the Mir space station and the International Space Station and many other examples clearly demonstrate the Russian Federation's commitment to effective models of partnership and international cooperation. The development of international cooperation on the basis of equality and mutually beneficial partnership in the field of space activities is one of the Russian Federation's main priorities. The development of the space potential of states and the organization of joint efforts as well as the expansion of international cooperation have acquired special significance in addressing the global

problems facing mankind, including the need to ensure international security.

The United Nations General Assembly has reaffirmed the commitment of its Member States to the development of international cooperation in the exploration and use of outer space for peaceful purposes, and has radically changed its approach in conducting space activities. States have recognized the advantages of joint efforts in space activities, of defining common goals and the need to make the best use of financial resources for space activities. One of the primary examples is the creation of the International Space Station, a huge project based on a promising and effective model of international cooperation.

Effective cooperation in space is impossible without active international collaboration, which has a huge multiplying effect with the combined potential of the countries in the global space community. Only by merging the efforts of all countries will it be possible to address the tasks facing humanity: preserving life on Earth, ensuring security and raising the living standards of all peoples. The significance of international cooperation will only increase in the future.

The range of international cooperation of the Russian Federation is growing as it pursues active integration of international space projects and programmes with India, the European Union, the United States, countries in the Far East and South-East Asia and other partners. Broadening links with all countries in every possible way in order to ensure its sustained development and that of the international community is a key priority of the Russian Federation as it pursues the development of international cooperation in the conquest of space. As many as 24 intergovernmental agreements have been concluded and implemented with the European Space Agency (ESA), the National Aeronautics and Space Administration (NASA) and countries such as Brazil, China, India and Japan.

Roskosmos, the Russian federal space agency, and other ministries and departments as well as enterprises that manufacture space and rocket equipment, are engaged in international space cooperation in the following key areas:

- use of Russian rockets for launching foreign payloads, including the formation of joint enterprises with foreign partners;

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- joint development of rocket engines, specifically the RD-180 for Atlas-type launchers;
  - investigation of scope for the launch of Russian rockets from near-equatorial launch facilities—for example, the “Soyuz-Kourou” project and talks with Australia on the possibility of building a space centre on Christmas Island in the Indian Ocean;
  - partnership in constructing the International Space Station and conducting scientific experiments on-board;
  - the field of fundamental space research, for example, in the development of the “Spektr” project with extensive cooperation from foreign partners including ESA, NASA, and the German Space Agency;
  - participation in the “Integral” project;
  - implementation of projects in the field of space medicine and biology (“Bion” spacecraft) and meteorology (“Meteor-3M” with the US SAGE-3 instrument); and
  - development of the “Kospas-Sarsat” international space rescue system (“Nadezhda” spacecraft).

Under the Russian Federation’s blueprint for the development of space activities, the principal tasks involved in the development of international cooperation in the field of space research are:

- to combine efforts at the inter-state level and establish close links and widespread cooperation with national space agencies of all countries and international organizations, ranging from concluding long-term agreements and the creation of partnerships for the implementation of joint initiatives and projects to concluding individual agreements for the provision of services and the sale of equipment and assemblies;
- to continue to develop cooperation in the implementation of major resource-intensive projects in the field of fundamental space research, to develop future launch vehicles and provide launch services, manned programmes, interplanetary expeditions and exploration of the universe, and to further navigation, meteorology, monitoring of the Earth and circumterrestrial space and other areas; and
- to combine efforts and broaden international cooperation in the use and investigation of outer space for peaceful purposes under the auspices of the United Nations, at the international, intergovernmental, inter-agency and enterprise levels.

The Russian Federation plan for the development of international cooperation for the use and investigation of outer space for peaceful purposes during the period 2006–2015 contains provisions to use outer space on a greater scale with the aim to address the key problems facing mankind as well as to more actively use the space potential built up in the scientific, technical, technological and resource fields.

At the same time, it is impossible not to see that underlying the pursuit of the peaceful uses of outer space by the international community is the threat currently facing the world community and international security in the shape of the incipient militarization of space. After the United States renounced the 1972 Anti-Ballistic Missile (ABM) Treaty, the international legal regime, which had ensured strategic stability in circumterrestrial space, was distorted. In a growing international legal vacuum, many space powers subsequently actively engaged in developing technology and equipment that could be used for military activities in space. The use of inner space as a new arena for military activities is causing significant changes in the nature of preparations for and the conduct of armed conflict. As a new area for military activities, space is also attractive because a relatively inexpensive (asymmetric) strategy can be used to cause substantial harm at a risk that is markedly lower than the risk attached to the use of conventional armed forces. The deployment of the space component of the US ABM defence system on the basis of small military and supporting space systems, which are inexpensive to produce, will make it possible in the future to create an orbital system that can prevent other countries from launching orbiters into space and also to launch a sudden strike on the key facilities of any state that is the victim of aggression or attack on its armed units on the ground.

The current attempts of the United States to establish military superiority in space will lead to a response from states that may lead to further militarization of space in a new twist in the arms race. The deployment of weapons in space will increase the vulnerability of the space infrastructure, of which more than 50% is accounted for by business, telecommunications, exploration and other components of states' socio-economic and defence sectors.

In the near future, the ultimate outcome of these attempts will be a rise in the volume of experiments and tests by many states aimed at creating space weapons. The creation of a military potential in space not only by the Russian Federation and the United States, but also by such states as China,

France, India and Japan will increase the risk of armed conflict and which will be difficult to avert. The deployment of weapons in orbit around the Earth will place new obstacles in furthering the peaceful uses of outer space, including for the United States.

If weapons are placed in space, it will be necessary to introduce immunity for satellites and security zones, and to equip the satellites of the future with additional systems for protection. This will substantially increase the cost of space activities for the world community and slow down the development of international cooperation in space activities as well as the implementation of international space programmes and projects.

All this points to the need to place the problem of monitoring the non-deployment of weapons in space and the prohibition of an arms race in space before the world community. It should be noted that the existing legal regime as applied to outer space does not by itself guarantee the prevention of placing weapons in space. There is still a need for the international legal system to neutralize efforts to militarize space. In addition, the coordination of efforts by international organizations to prevent the deployment of weapons in space is a high priority.

Consequently, the prevention of an arms race in space together with expanding international cooperation in the use of outer space are matters of high priority for the Russian Federation. Thus, among the current items on the agenda of the Conference on Disarmament (CD), the Russian Federation is most keenly interested in a rapid start to dealing with the issue of the prevention of an arms race in space within an appropriate ad hoc committee of the CD.

An initial measure in addressing this problem could be to draft a treaty such as the one proposed by China and the Russian Federation on the prevention of the deployment of weapons in outer space and the use or threat of force against outer space objects. In recent years, the Russian Federation has put forward a number of initiatives designed to reduce and neutralize the efforts of certain states to militarize outer space. Specifically, in October 2004, in the First Committee of the Fifty-ninth session of the United Nations General Assembly, the Russian Federation stated for the first time unilaterally and without any conditions that it would not be the first to deploy weapons of any type in outer space. It called on all states that possess space potential to follow suit. This declaration confirms that the

Russian Federation has no intention of posing a threat to anyone in or from outer space.

At the same time, it must be noted that the possible militarization of space would be the cause of other dangerous factors such as “space debris” and the “growing traffic in small and very small spacecraft”. If we assess the influence and significance of these factors in terms of the level of security in space, we must recognize the need to take them into account in addressing the problem of preventing an arms race in space. Thus, these threat factors should be considered in greater detail.

First, there is a clear tendency for the amount of “space debris” to grow. The Russian Federation shares the growing concern of the world community of the danger posed by space debris, first and foremost for the International Space Station and manned space flights.

In pursuing a coordinated sectoral policy aimed at reducing space debris, Roskosmos entered into force the Space Debris Population Standard (OST-134-1023-2000) *Space Technology Items: General Requirements for Limiting the Technogenic Pollution of Circumterrestrial Space* in 2000. The requirements set out in the standard generally correspond to the requirements laid down by organizations and states that are members of the Inter-Agency Space Debris Coordination Committee and require mandatory adherence to guidelines in the design and operation of space and rocket equipment as follows:

- minimization of the potential for in-orbit break-ups;
- removal from orbit after completion of a flight programme in geostationary orbit;
- removal from orbit after completion of a flight programme in low-Earth orbit (< 2,000 kilometres);
- limitation of debris released during normal operations; and
- prevention of in-orbit collisions.

The Russian Federation’s space and rocket industry is taking a variety of steps to reduce technogenic pollution of circumterrestrial space. Together with increases in the active lifespan of spacecraft and a ban on the destruction or deactivation of obsolete space objects, these measures include:

- for geostationary orbits, removal of obsolete space objects into “graveyard” orbits; and
- for high-Earth orbits, in which Russian and American multi-satellite navigation systems are operating and European and Chinese navigation systems will soon be deployed, studies that are currently being carried out on the mutual influence of these systems as they develop.

The second threat factor is the growing importance of the extensive use of miniaturization in space technology and the development of small satellites and very small spacecraft, including those with a military purpose. The use of small and very small spacecraft in performing defence functions is currently a strongly developing sector in space technology.

This is demonstrated by the number of symposia and conferences held on this issue in recent years in the Russian Federation and the United States, and specifically a symposium held at the Massachusetts Institute of Technology in 1999, with participation by representatives of the US Air Force, the Lockheed Martin corporation and the Aerospace Corporation, which examined the problem of creating cluster systems in the period 2003–2007 using micro-satellites and nanosatellites with distributed functions (the Tech-Sat-21 programme), as well as using nanotechnologies in space systems and the design of autonomous systems to service spacecraft in space. By 2007, it is planned to create clusters of dozens of micro-satellites weighing approximately 20 kilograms that will each operate as a single system.

An analysis of the development of space objects with small mass and dimensions found:

- a steady increase in the number of countries and avenues of development that are creating space objects using micro-technologies and nanotechnologies;
- increased worldwide interest in the exploration and use of outer space with the help of micro-satellites and nanosatellites, promising relatively rapid application of the “faster-better-cheaper” principle thanks to shorter periods of development for these spacecraft and lower costs for their manufacture and launch into working orbits;
- the existence of practical experience with the corresponding technological programmes (primarily in the United States), which offers

the prospect that space systems consisting of hundreds of micro-satellites and nanosatellites can be created in the near future; and

- the appearance of new light rockets on the world market and efforts to equip existing medium and heavy rockets for launches of micro-satellites in the form of additional payload.

Problems expected in ensuring environmental and military security in circumterrestrial space when small spacecraft are used include:

- a rise in the density of occupation of circumterrestrial space;
- a reduction in the detectability of spacecraft; and
- an increase in the danger that micro-satellites will be used for purposes that run counter to international space law, national space law and criminal law or violate the requirements of such laws.

The consequences of these problems are:

- a rise in the number of obsolete fragments in circumterrestrial space and the risk of collision with operational spacecraft;
- a danger of uncontrollable and hostile actions in space;
- exacerbation of the problem of the electromagnetic compatibility of different space systems; and
- the need to monitor spacecraft throughout their period of active operation and full lifespan.

In considering these factors, it could be concluded that when addressing the scientific, technical and international legal aspects of preventing an arms race in space, it is desirable to take into account, as limiting factors, measures being taken to prevent technogenic pollution of circumterrestrial space, and also measures which must be taken to limit the growing traffic in small and very small spacecraft. (Currently it is forecast that clusters of small and very small satellites will be used extensively for military purposes.)

The objective reality of our time lies in the fact that strategic stability and international security will increasingly depend on what happens and will happen in space orbits and trajectories. Consequently, it is necessary to take firm control of the incipient processes of the militarization of space.

International space activity is an important tool for preventing militarization of space. Active cooperation in international space activities by states in the world community under the auspices of international organizations of the United Nations in the interests of comprehensive international security, protection of the environment and accelerated socio-economic development of states is the most effective strategy for preventing the militarization of space. This aspect of world space activity should become a priority for the world community, all the more so as there are serious prerequisites for this—the requirement for the steady development of the world community.

In the near future, the greatest progress will be achieved on the path of multilateral cooperation among states in the use of applied space facilities. The results of system-based forecasting indicate the following promising and high-priority avenues for the development of space science in the twenty-first century for the world community:

- ensuring the global exchange of information, achievable for all inhabitants of the Earth;
- rational use of transport;
- addressing environmental problems;
- rational use of the Earth's natural resources;
- reliable forecasting of disasters;
- addressing global problems of human survival away from Earth;
- lowering the cost of carrying payloads into space;
- preventing pollution of outer space;
- developing manned flights; and
- integrating countries and developing international space systems.

An analysis of the potential of each of these areas regarding the creation of highly effective space systems showed that on the basis of developed technologies, it will become possible to construct an integrated system of comprehensive international security for the world community, whose role will include neutralizing the actions of the forces of international terrorism.

In the current circumstances, international organizations—the United Nations and its specialized agencies—play an exceptionally important role in the development and intensified use of space facilities for pursuing socio-

economic objectives, protecting the environment and ensuring international security.

There are plans in place, by 2015, to implement urgent international space projects and programmes in such areas as environmental monitoring, fundamental environmental research, efforts to combat natural disasters, management of natural resources and development of the potential of computerization at the state level. In particular, evaluations carried out by specialists have shown that in the near future, the greatest potential from the viewpoint of the useful return on space activities would involve Russian participation such as:

- creation, operation and use of the International Space Station;
- creation of a single global international system of time and geographical coordinates through integration of global positioning systems, Glonass and Galileo;
- expansion of international cooperation in refining and developing the Global Monitoring for Environmental and Security system on the basis of the latest remote Earth sensing technologies;
- extension of fundamental scientific research on the basis of the potential of modern space technologies (for example, the international programmes Integral, Spektr and Mars-Surveyor);
- expansion of international cooperation in refining and developing launch facilities (for example, the Soyuz-Kourou programme, collaboration with the French space agency Centre National d'Études Spatiales and the Automated Transfer Vehicle with ESA); and
- development of international cooperation in implementing the Moon programme and the programme of manned flight to Mars.

US President George W. Bush declared on 14 January 2004 the intention of the United States to begin a space programme for the resumption of manned flights to the Moon, the construction of settlements on the Moon and preparations for an expedition to Mars. It is expected that the United States will create permanent operating scientific stations on the surface of the Moon as a first step toward the conquest of Mars. The US president's statement on a possible change in American space policy during the first half of the twenty-first century was welcomed by states engaged in space activities—for example, France and Japan—which expressed their intention in participating in the implementation of the space programmes and the related projects. The Russian Federation has relevant scientific,

technical and production technology experience, including significant related achievements over recent years in this area, which could be effectively used in the context of international cooperation in the event that the United States pursues the announced programme of interplanetary flights to the Moon and Mars.

At the same time, modern space science has accumulated considerable scientific and technological potential for addressing many global problems facing mankind, including broad and useful space activities of the world community aimed at monitoring (protection) of the Earth as a single ecosystem and the rational use of its natural resources, ensuring the implementation of the strategy for the steady development of the world community, speeding up socio-economic development and creating a system of comprehensive international security and efforts to combat terrorism.

While supporting the US president's initiative, it is essential to highlight the desirability of shaping a broader long-term space strategy for the world community that also contains provisions for addressing both the global problems facing mankind and the proposed US space policy for conquering the Moon and Mars. Such action will correspond to the genuine interests of the world community, since it will create conditions for ensuring strategic stability and the implementation of the strategy for the sustained development of the world community declared by the United Nations.

In conclusion, and bearing in mind the new circumstances surrounding modern international space activities, we wish to highlight the emergence of new threats, that is, the appearance of "gaps" in international law governing the peaceful uses of outer space. We advocate taking practical steps to consign the incipient processes of militarization of space under international control. The investigation and use of space must be pursued for exclusively peaceful purposes. The Russian Federation advocates the adoption of collective measures to address the issue of preventing the deployment of weapons in space and the spread of the arms race into space, and is ready to play an active part in the development of international cooperation in this endeavour.