The first Russian civil system of continuous monitoring of near-Earth space

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ABSTRACT

The article analyzes the Russian experience of creating and operating the first civil system for continuous monitoring of near-Earth space. A brief analytical review of the current issues of ensuring the sustainable development of space activities is conducted, possible mechanisms for ensuring the safety of space operations and protecting the space environment are suggested.

Man-made space debris in the near-Earth space is a negative side result of more than 60 years of successful global space activity. Modern global financial investments in the creation, launch and operation of spacecraft is enormous: for example, the total cost of spacecraft in the geostationary orbit area exceeds 100 billion of dollars. Of particular concern is the explosive growth of spacecraft in near-Earth, including the deployment of satellite mega-constellations space, which is predicted in the next decade. The information on the current situation in near-Earth space is made up of data on objects of artificial origin (man-made objects), on events and operations in near-Earth space, on electronic environment, on the factors of the natural environment which are inherently dangerous to the functioning of automatic and manned spacecraft.

In 2010, within the framework of the Federal Space Program of Russia, the Federal Space Agency began the work on creation of a specialized system for the safety of operations in space. This system was focused on work in the conditions of growth of a man-made debris in space, a sharp increase in the intensity of space activity, an increasing number of participants who are not interested in mutual coordination on this matter and do not have funds for it. This work was completed by State Space Corporation "ROSCOSMOS" and the system has been in full operation in Russia since 2016 and was called "Automated Warning System on Hazardous Situations in Outer Space" (ASPOS OKP).

The article presents the tasks solved by ASPOS OKP, its composition and characteristics, geographical location, development potential, including its opportunities in the framework of international cooperation. ASPOS OKP takes on enormous importance in ensuring the international obligations of the Russian Federation on the problem of space debris.

A responsible attitude to the issues of “clean up debris in space” becomes crucial for ensuring the long-term sustainability of space activities considering the increasing dynamics of the involvement of countries in the global space community and the variety of formats and purposes of participation in space activities. The complex nature of the problem of countering space threats related to man-made space pollution, the high degree of scientific and technical complexity as well as the considerable resource-intensity demanded for its resolving, objectively determine the need for close international interaction between participants in outer space activities.

The informed decision-making to counter threats related to an inevitable proliferation of space debris is possible only on the basis of reliable and timely data. The implementation of the idea of digital space could be of fundamental importance for the safety of space operations and the protection of the space environment. This idea could be addressed, for example, in the format of information and communication platform under the auspices of the United Nations.

A global information and communication project with the code name "Digital Space" could be an effective mechanism for integrating the efforts of States, international intergovernmental organizations, satellite operators, specialized national and international non-governmental organizations. The goal of such integration is the formation and maintenance of a globally accessible, continuously updated database on objects, phenomena and events in outer space. This will remove the urgent problems in the field of collecting, systematizing and publicly providing information on the world's space activity.