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Committee on the Peaceful Uses of Outer Space

International cooperation in the peaceful uses of outer space: activities of Member States

Note by the Secretariat

Addendum

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II. Replies received from Member States

Algeria

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International cooperation in the peaceful uses of outer space

National report on space activities

Over the course of 2020, Algeria has continued to carry out activities under the various components of its national space programme.

At the national level, the Algerian Space Agency (ASAL) has continued to implement space application projects with sectors that are using space technology, especially in relation to natural hazards (including forest fires, locust swarms and flooding) and natural resources (including water resources, forecasting of cereal crop yields and geological mapping). Furthermore, steps have been taken to establish cooperation agreements with a number of those sectors, including culture and the arts, agriculture and public works, concerning the design, development and implementation of decision-making tools based on space technology and applications. Value-added cartographic products derived from space data and images and geographical information systems are made available to partner entities, which are also provided with training and advanced training in the areas of remote sensing, geographical information systems and global navigation satellite systems.

ASAL also plays an active role, as a member of an intersectoral committee led by the Ministry of Foreign Affairs, in implementing the indicators relating to the goals and targets of the 2030 Agenda for Sustainable Development through the use of space data.

With regard to training and human capacity-building in the area of space technology, ASAL has begun setting up the School of Geodesy and Space Technology, which will offer specific training programmes geared towards meeting the growing need of the user sector for highly qualified personnel with expertise in the use of space technology and applications. In addition, academic and short-term training activities abroad have been carried out or are under way:

- (a) China: Regional Centre for Space Science and Technology Education in Asia and the Pacific (China);
- (b) China: training as part of the Alcomsat-1 programme at the Beihang, Shanghai and Wuhan universities;
- (c) India: Indian Space Research Organization and Indian Institute of Remote Sensing as part of the Indian Technical and Economic Cooperation Programme;
- (d) United Kingdom: training as part of the Alsat-1B programme.

In terms of space infrastructure and systems, over the course of 2020, ASAL has carried out maintenance operations to keep its satellites and ground control segments in optimum operating condition. This applies in particular to its high- and medium-resolution Earth observation satellites, namely, Alsat-2A/Alsat-2B (2.5 m) and Alsat-1B (12 m) and telecommunications satellite Alcomsat-1.

Key information on Algerian space systems:

- (a) Alsat-1B: has been in operation for four years and to date has generated 9,130 products covering a total area of more than 205 million square km;
- (b) Alsat-2A/Alsat-2B: in operation for 10 and 4 years, respectively, these satellites have generated more than 322,000 products covering an area of more than 31.6 million square km;

(c) Alcomsat-1: completed its third year of operations in 2020 and has contributed to the development, for national user sectors, of applications relating to broadcasting and telecommunications in the Ku- and Ka- bands.

Algeria is of the view that international cooperation in the peaceful uses of outer space is the most appropriate way to foster the exchange and transfer of knowledge and know-how and to promote space technology and applications in support of human development and well-being. Accordingly, Algeria has continued its international cooperation efforts by negotiating new space cooperation agreements – soon to be finalized – with the Governments of the Russian Federation and the Republic of Korea and initiating talks with the Government of Italy on the establishment of an outer space agreement. In addition, ASAL has contributed to the establishment of the Arab Group for Space Cooperation, which brings together space agencies and institutions with the aim of promoting exchange and cooperation between Arab countries in the area of space science and technology. The initiative was welcomed by the League of Arab States at its thirtieth summit, held in Tunis on 31 March 2019.

With regard to events on space technology and applications organized by United Nations bodies and space agencies and institutions, ASAL took part in the technical advisory support mission of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), which was held in Tunisia from 4 to 11 March 2020 in coordination with the Tunisian National Civil Defence Office. Algeria, represented by ASAL, also took part in the following events, which were held by videoconference owing to the health crisis caused by the coronavirus disease (COVID-19) pandemic:

(a) The UN-SPIDER international expert meeting on space-based solutions for risk and disaster management in Africa, held from 30 June to 2 July 2020;

(b) The first Space Economy Leaders Meeting (Space20), held on 7 October 2020. The meeting was a Saudi Arabian initiative aimed at raising awareness of the space economy and providing an opportunity for G20 countries to collaborate on existing and future projects on the peaceful exploration of outer space;

(c) The seventy-first International Astronautical Congress, on the theme “IAF Connecting All Space People”, held from 12 to 14 October 2020;

(d) Preparatory workshops for the World Meteorological Organization Data Conference. The workshops took place from 24 September to 28 October 2020 and were aimed at developing a common understanding of the role that the international exchange of observational data could play in monitoring and forecasting in relation to the Earth system (weather, climate and water);

(e) The United Nations Introductory Technical Advisory Mission on Space Law for New Space Actors: Fostering Responsible National Space Activities in the African Region, which took place on 7 December 2020;

(f) The United Nations Conference on Space Law and Policy: Emerging Issues in Space Law and Policy – Perspectives for African Nations, organized in cooperation with the Economic Commission for Africa and held from 8 to 10 December 2020.

At the regional level, Algeria has continued to support initiatives to promote inter-African cooperation for sustainable development and human well-being in Africa. In this connection, ASAL took part in a regional workshop on shared services as part of the Global Monitoring for Environment and Security (GMES) Africa programme, held in Nairobi from 16 to 19 March 2020. Algeria also participated in the following regional events, which were held by videoconference owing to the COVID-19 pandemic:

(a) The African Workshop on Global Navigation Satellite Systems and Space Weather, organized by the African Regional Centre for Space Science and Technology Education – in French Language and held on 5 and 6 October 2020. The objective of the workshop was to provide participants with an introduction to ionospheric physics

and the science of space weather, including basic knowledge of global navigation satellite systems and their applications;

(b) A training workshop on Earth observation for monitoring irrigation and estimating water consumption, organized jointly with the African Regional Centre for Space Science and Technology Education – in French Language as part of the GMES Africa programme and held from 24 to 26 November 2020;

(c) A preparatory meeting of the African Union Commission, held on 19 November 2020, with the participation of African space agencies and other stakeholders in preparation for African Space Week, to be held from 20 to 26 March 2021.

In respect of research on space debris, the safety of space objects with nuclear power sources on board and problems relating to their collision with space debris are issues of particular importance to Algeria because of its size, the density of its population and the growing number of space objects in orbit over its territory. However, the country has not yet undertaken research on space debris or put in place a national mechanism for space debris mitigation owing to the recency of its space activities and the small number of Algerian satellites in orbit. Algeria welcomes the work of the Office for Outer Space Affairs of the Secretariat to promote international collaboration and foster progress in this area and reiterates its support for the efforts of the international community to mitigate space debris and protect the orbital and suborbital environments.

With regard to the safety of space objects with nuclear power sources on board, Algeria, which actively participates in the work of the Committee on the Peaceful Uses of Outer Space and its two subsidiary bodies and endorses the principles related thereto, is concerned about the possible consequences of the use of such power sources in outer space, which would undermine any form of long-term sustainability of outer space activities and the preservation of outer space as the common heritage of humankind for future generations. For that reason, it recalls the provisions of article IV of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, which stipulates that States parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

Algeria considers it essential that States pay greater attention to the potential consequences of the use of nuclear power sources and supports all initiatives involving the transfer of expertise in that area in order to enable all States that wish to make use of power sources in outer space to do so safely.

In addition, Algeria is continuing to adapt its national legal framework governing outer space activities, including through the preparation of implementing legislation for the Space Activities Act, which was enacted in 2019. That implementing legislation comprises:

(a) Legislation relating to the procedures for registration in the National Registry of Objects Launched into Outer Space;

(b) Legislation on mechanisms for risk prevention and emergency response.

The Space Activities Act establishes a legal framework enabling the State to regulate its activities – which could give rise to international liability – while ensuring their achievability and sustainability, thus serving as an essential tool in guaranteeing safety and sustainable development.

Russian Federation

[Original: Russian]
[24 November 2020]

Report of the Russian Federation on the outcomes of its space activities in 2020, including action to mitigate human-caused space debris in near-Earth space

In accordance with the Framework for the State Policy of the Russian Federation Relating to Outer Space Activities for the Period up to 2030 and Beyond, the following objectives have been pursued as part of the State programme of space activities for the period 2013–2020:

(a) The building up of orbital constellations of satellites used for various purposes and the introduction of space technologies to meet needs for space products and services;

(b) Guaranteed access for the Russian Federation to space from its territory and the safe long-term use of near-Earth space in view of the increasing levels of space debris resulting from human activity;

(c) Full participation in projects carried out by the international community in relation to the exploration and use of outer space;

(d) Scientific research and the gathering of data on outer space, the Earth and other celestial bodies in order to develop fundamental science and the attainment of leading positions in significant areas of scientific endeavour, including the study of the Moon, Mars and other bodies of the solar system;

(e) Crewed space missions.

As at 1 November 2020, a total of 12 carrier rockets had been launched, as a result of which 100 satellites intended for various purposes were placed in orbit. Work has continued on the maintenance and development of an orbital constellation of communications, broadcasting and retransmission satellites, including the monitoring, forecasting and assessment of hazardous phenomena (such as hurricanes, storms, typhoons, floods and ice formations).

Work has also continued on the establishment of an Earth remote sensing information centre and the building of the centre's infrastructure. Stations for receiving, processing and storing data have been established and a data-collection system for Eurasia has been created.

By the end of 2020, the Digital Earth project, the goal of which is to achieve complete and continuous multilayer dynamic coverage with regard to Earth remote sensing data, is expected to enable unrestricted access to space-based remote sensing data and to the services established on the basis of those data. Technological solutions are being leveraged to meet the needs of digital transformation, faster data transmission, data exchange and non-discriminatory access to geospatial information online. Products derived from complete and continuous multilayer dynamic coverage can be used in the implementation of sector-specific decision-making tools. Digital Earth is regarded as a fundamental component of the unified digital platform for geospatial data.

Implementation of the Sphere programme for the comprehensive development of space information technologies has continued. By 2030, the Russian orbital constellation will consist of more than 500 satellites.

In the commercial sector, mobile satellite communications, remote sensing space systems and navigation services and equipment have been developed and steps have been taken to set up companies in promising areas.

The features of the Russian Global Navigation Satellite System (GLONASS) have been maintained at a competitive level and the system has continued to determine

coordinates with the necessary accuracy. The orbital constellation of the GLONASS system as at 1 November 2020 included 28 navigation satellites.

Carrier rockets were launched from the Baikonur and Plesetsk launch sites.

Work is under way to construct Angara and Soyuz-5 series launch vehicles that use environmentally friendly rocket fuel components and to develop a next-generation crewed spacecraft, Orel (“Eagle”).

Ground-based infrastructure for the launch of space payloads is being developed. At Vostochny Cosmodrome, construction of the launch complex for Angara series carrier rockets, currently in its second stage, has continued and the installation of technical equipment at the complex has been completed.

When developing and operating space rocket and space technology products, Russian developers comply strictly with the requirements of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space and national legislation in force, taking into account developments with respect to the introduction by other space actors of relevant measures into their respective practices.

Within the framework of national projects, work is being carried out to finalize a model of the unobserved space debris population. Research has been carried out with a view to the construction of a special statistical model of space debris formed as a result of destruction of a satellite.

Improvement of the regulatory and technical framework is contributing to effective solutions to the space debris problem. Work is being carried out in accordance with standard GOST R 52925, entitled “Space technology products: general requirements applicable to space assets in order to limit the human-caused pollution of near-Earth space”. Developments in the area of space debris mitigation, including the requirements of international standard ISO 24113 on space debris mitigation, have been taken into account. Those requirements apply to all space assets, whether newly constructed or modernized. The most important applications of technology for countering the threat of space debris in near-Earth space are the prevention of collisions of the International Space Station (ISS) with dangerous space objects and the removal of satellites that have ceased operating and of orbital stages of carrier rockets to safe disposal orbits.

There were 429 recorded instances in which dangerous space objects passed close to ISS, breaching the Station’s 10-km safety zone, including 112 conjunctions at a minimum distance of less than 4 km. Two avoidance manoeuvres were performed in order to prevent the Station’s collision with such objects. The Russian Express-A4 satellite was removed from geostationary orbit. The parameters were consistent with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space.

The Russian Federation is actively fostering cooperation in international forums at various levels. Within the framework of the Convention of the Commonwealth of Independent States (CIS), the CIS Inter-State Space Council held its first meeting, at which the following issues were discussed:

- (a) The integration of ground-based infrastructure that uses GLONASS;
- (b) The development of systems for monitoring human-caused space debris in near-Earth space and international legal mechanisms for the mitigation and active removal of such debris;
- (c) Earth remote sensing and space research, including astrophysical and planetary studies.

A trilateral agreement with the Republic of Kazakhstan and the United Arab Emirates to modernize the Gagarin launch pad at the Baikonur cosmodrome has been drawn up.

An agreement has been signed on expansion of the capabilities of the joint Russian-Belarusian constellation of Earth remote sensing satellites and work has continued on the construction of a new Belarusian Earth remote sensing satellite.

A programme entitled “Integrated system of the States members of the Eurasian Economic Union for providing space-related and geographical information products and services on the basis of national sources of Earth remote sensing data” has been approved. The aims of the programme are to facilitate the implementation of integration processes in relation to the development and application of Earth remote sensing tools and to increase the competitiveness, on the world market, of remote sensing data, products and services offered by producers in member States.

Space research projects have continued to be implemented. Examples of cooperation between Russian entities and foreign partners include the following:

(a) The establishment of an ultraviolet spectrum astrophysical observatory, with the participation of Spanish organizations;

(b) Astrophysical studies of the universe in the X-ray portion of the electromagnetic spectrum, with the involvement of the Max Planck Institute for Astrophysics and the German Aerospace Center.

The Spektr-R space-based astrophysical observatory was launched. The observatory is equipped with X-ray mirror telescopes: ART-XC (Space Research Institute of the Russian Academy of Sciences, Russian Federation) and eROSITA (MPE, Germany), which operate on the principle of oblique incidence X-ray optics and are mounted on a Navigator satellite platform (Lavochkin Research and Production Association, Russian Federation) that has been adapted to the project objectives.

With the help of the Spektr-RG observatory, 10 completely new, previously unknown galaxies with active nuclei – supermassive black holes, which are currently absorbing stars, planets and interstellar gas – have been discovered. A map of the sky in X-rays has been produced and more than a million sources of X-rays have been recorded. The observatory’s telescopes continue to operate and a second survey of the sky is under way.

As part of the international project ExoMars, the Mars research programme has continued from aboard the Trace Gas Orbiter (TGO) orbiting spacecraft, which is equipped, inter alia, with instruments made in the Russian Federation.

Work has been carried out to ensure the execution of previously planned missions involving study of the planets of the solar system, their surface and atmosphere and the nature of evolutionary processes on those planets.

The Russian Federation has continued to comply with its obligations in respect of the operation of ISS and has been implementing the programme of applied scientific research and experiments for 2020 aboard the Russian segment of the Station. Two Progress MS cargo spacecraft and two crewed Soyuz MS spacecraft were launched, transporting four Russian astronauts and two National Aeronautics and Space Administration (NASA) astronauts, together with scientific equipment, fuel and other cargo, to ISS.

In 2020, the Russian Federation has actively developed space activities in all areas, in line with the commitments it has undertaken in the context of projects relating to the exploration and peaceful use of outer space.