3 February 2020

Original: English and Russian

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

Contents

I. Introduction

1. At its fifty-sixth session in 2019, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities (A/AC.105/1202, para. 41).

2. In a note verbale dated 15 July 2019, the Office for Outer Space Affairs of the Secretariat invited Member States to submit their reports by 21 October 2019. The present conference room paper was prepared by the Secretariat on the basis of replies received in response to that invitation.

II. Replies received from Member States

Canada

[Original: English]
[25 November 2019]

Summary

Canada engaged in a diverse range of space activities in 2019, highlights include: the flight of Canadian astronaut, David Saint-Jacques, to the International Space Station (ISS) for his first mission, including the deployment of the Life Science Research System (LSRS); the successful launch of our RADARSAT Constellation Mission (RCM); the launch of the Junior Astronauts campaign; Canada's commitment to the Lunar Gateway program and LEAP; and milestone anniversaries for some of Canada's key space assets, including Dextre and MOPITT. In May 2019, Canada hosted the 41st meeting of the International Charter Space & Major Disasters and assumed the responsibilities of the Charter's lead agency for a six-month period.

The International Space Station (ISS)

Canada's contribution to the ISS, the Mobile Servicing System (MSS – comprised of Canadarm2, Dextre, and the Mobile Base System), demonstrated its importance as the critical robotics system by performing resupply, maintenance, and service tasks essential to ISS operations. Canadarm2 was used to capture, manoeuvre, unload, and release various cargo vehicles including SpaceX's Dragon, Northrop Grumman's Cygnus and Japan's H-II Transfer Vehicle. Dextre and Canadarm2 remain critical to the maintenance of the ISS as well as maintenance and deployment of its externally deployed payloads, providing valuable flexibility to ISS planners for rapid recovery from anomalies while reducing the number of time-consuming spacewalks.

Human Space Flight

On December 3, 2018, astronaut David Saint-Jacques launched on Canada's 3rd long duration crew mission to the ISS. His six-month stay on the ISS included record-setting productivity in science. In April 2019, David become the 4th Canadian to walk in space (and the first to do so in 12 years). He returned to Earth with his Soyuz crew in June 2019. This was his first mission, the 17th Canadian spaceflight, and the longest (204 days) by a Canadian.

During his assignment on the ISS, Dr. Saint-Jacques performed critical robotics and operations tasks, including a spacewalk, conducted a series of Canadian and international science experiments, acted as crew medical officer, and shared his experience through numerous education and outreach events.

Lunar Initiatives

Countries from around the world are getting ready to send humans farther into our solar system, beyond the International Space Station (ISS). Nearly 400,000 km

away from our planet, the Moon represents a crucial stepping stone in humanity's quest to travel onwards to Mars. Moving beyond the ISS, the ISS partnership is discussing a space platform in a lunar orbit – called the Gateway – that will extend human presence and further demonstrate and prove technologies and operations at a larger distance from Earth. On Feb 28, 2019 the Government of Canada announced its commitment to join the US-led Lunar Gateway program, which includes an investment of $1.9B CAD over 24 years to develop an autonomous, AI-enabled robotics system for the Lunar Gateway.

Canada is currently in the planning phase to initiate the development of the Canadarm3 and, in the meantime, the Gateway External Robotic Interfaces (GERI) project has been initiated. The GERI project is currently in the Detailed Project Requirements Setting Sub-phase (Phase A) since August 16, 2019. The aim of the GERI project is to deliver two types of interfaces to the International partners ahead of the Canadarm3 system.

Coupled with Gateway, a new Lunar Exploration Accelerator Program (LEAP) was announced, with an investment of $150M CAD over five years. LEAP will support space technology development and in-space demonstrations, as well as science missions. Its aim is to expand and prepare Canada’s space sector for future exploration missions by offering technology development, science and mission opportunities in lunar orbit, on the Moon’s surface, or further into deep space.

LEAP will be delivered under two parallel streams: 1) a digital healthcare stream that will focus on developing innovative astronaut healthcare technologies and assessing how to leverage them to help improve healthcare delivery in Canada, particularly in remote and Northern regions; and 2) a science and technology stream that will focus on the development and demonstration of cutting edge science instruments and AI-enabled robotics. Both streams will support key Canadian industrial capabilities in niche technology areas that are likely to be highly sought after for future international missions. This will ultimately lead to the flight of one or more Canadian scientific or technology demonstration payloads to the Moon and Mars in the next five years that will advance our scientific knowledge in priorities areas defined by the Canadian space exploration community, and position Canada well for international missions that take place beyond the initial five year LEAP window.

Life Science

Human health science remains the Canadian priority for the utilization of the ISS. Canada is developing new multipurpose medical and research platforms to address risks associated with human space flight, such as the Life Science Research System (LSRS), which was deployed on the ISS in 2019. The LSRS is designed to support the identification, characterization and mitigation of the risks associated with the space environment for astronauts. Canada also initiated the development of a novel and breakthrough biological sample preparation technology for the ISS, MicroPrep and pursued seven scientific studies related to health on the ISS: T-Bone, Marrow, At Home in Space, Vascular Echo, Wayfinding, Vection, and Radi-N2.

Space Atmospheric Sciences

Canada’s SCISAT satellite, measuring ozone and ozone depleting substances, continues to operate nominally and its contributions were highlighted in the United Nations/WMO Scientific Assessment of Ozone Depletion Report released in early 2019. It is the only satellite measuring hydrofluorocarbons (HFCs) from space and is well positioned to support future monitoring efforts of the Kigali Amendment to the Montreal Protocol. It is also the only satellite able to measure all major greenhouse gases, including atmospheric profiles of carbon dioxide down to 5km, which supports monitoring efforts of the United Nations Paris Climate Agreement. Its data has been used by over 30 space instrument teams from around the world on 20 different satellites.

The CSA also continues to support Canada's Optical Spectrograph and InfraRed Imaging System (OSIRIS) instrument onboard the Swedish Odin satellite, measuring atmospheric composition. The ozone dataset from OSIRIS has been merged with other instruments to study long-term trends and analysis of ozone recovery. Its atmospheric profile data was highlighted in the 2018 Executive Summary of the United Nations/WMO Scientific Assessment of Ozone Depletion and its aerosol dataset has been used in the Government of Canada's support of comparison activities using numerical models to understand the Earth system (United Nations World Climate Research Program's CMIP-6).

Finally, 2019 marked the 20th anniversary of Canada's Measurement of Pollution in the Troposphere (MOPITT) instrument onboard the NASA Terra satellite. The instrument continues to scan the Earth's atmosphere and collects profile measurements of carbon monoxide to support air quality and climate studies. Its data have been studied by over 1500 researchers from almost 400 institutions in over 45 countries. MOPITT is the longest-running pollution monitor in space today and the longest continuously-operating space mission in Canadian history.

Planetary Exploration

The Canadian Alpha Particle X-Ray Spectrometer mounted on NASA's Curiosity rover is continuing to perform well. Curiosity is entering its third extended mission phase. It has been used routinely over the last seven years to measure the amounts and types of chemical elements that are present in Martian rocks.

Canada provided the OSIRIS-REx Laser Altimeter (OLA) on NASA's asteroid-sampling mission OSIRIS-REx, which arrived at asteroid Bennu in December 2018. OLA is a sophisticated laser-based mapping system that has been used extensively to create a detailed topographic map of Bennu in order to select the sampling site. The mapping of Bennu is now complete and OSIRIS-REx is ready to move to the sampling phase for an eventual return to Earth in 2023.

Space-Based Astronomy

Canada is operating the Near-Earth Object Surveillance Satellite, NEOSSat (launched in 2013), on a dual mission in space astronomy and space situational awareness in partnership with Defence Research & Development Canada (DRDC). NEOSSat has delivered data to the Minor Planet Center for a number of asteroid/comet observation campaigns, including for the close approach of the near-Earth asteroid 1999 KW4 and the interstellar comet C/2019 Q4 Borisov. In addition, NEOSSat is now routinely engaged in photometric follow-up of exoplanet candidates from NASA's Kepler and Transiting Exoplanet Survey Satellite (TESS). In 2019, CSA launched a Guest Observer program, through which Canadian astronomers and their international collaborators have proposed new experiments and observation campaigns using NEOSSat.

Canada continues to support the James Webb Telescope project, a partnership between NASA, ESA, and the CSA. The partners are working towards a 2021 launch date. Canada has provided the Fine Guidance Sensor (FGS), a critical element of the mission used for extremely precise pointing of the telescope, and the Near-Infrared Imager and Slitless Spectrograph (NIRISS).

The CSA continued its collaboration with the Indian Space Research Organisation (ISRO) on ASTROSAT. Canadian astronomers are now eligible to obtain data from ASTROSAT thanks to the provision of Canadian detectors for UVIT, the twin UV and visible imaging telescopes, on India's ASTROSAT.

Canada is a partner in the BRITE Constellation with Austria (University of Vienna and Graz University of Technology) and Poland (Copernicus Astronomical Center). The constellation observes the most luminous stars, including massive blue stars.

In addition, Canada joined the science team for JAXA's X-Ray Imaging and Spectroscopy Mission (XRISM) mission. The CSA is collaborating with NASA to test and calibrate one of XRISM's instruments at the Canadian Light Source in Saskatchewan in exchange for eligibility to compete for observation time.

Space Weather

Space weather science requires world-wide ground and space-based observations to develop models that will ultimately contribute to the detection and mitigation of risks. Given Canada's northern location, it is highly impacted by the effects of space weather, but also has a front row seat to observe the near-Earth space environment (geospace) where space weather occurs.

Canada's Geospace Observatory initiative observes geospace using arrays of ground-based instruments deployed across Canada and the data acquired is openly available to scientists worldwide.

Canada also continues to operate ground imagers and magnetometers across Canada, through the support of the University of Calgary and the University of Alberta, to contribute to the NASA THEMIS mission through ground-based observations of the aurora borealis.

Canada will be providing an Ultraviolet Imager to the ESA-China (the National Space Science Center of the Chinese Academy of Sciences) Solar-Wind Magnetosphere Ionosphere Link Explorer (SMILE) mission, whose goal is to simultaneously observe the impact of the incoming solar wind on the magnetopause and its effect on the aurora borealis, even during daytime, to better understand the role of the magnetosphere in shielding the Earth from incoming solar radiation.

Canada is a partner in the European Space Agency's (ESA) Swarm mission (launched in 2013), designed to measure the magnetic fields generated by the Earth. ESA procured a Canadian Electric Field Instruments (EFI) for each of the three satellites. The University of Calgary, supported by the CSA, uses measurements from the EFIs to learn about the influence of space weather on the space environment.\

Finally, Canada continues to lead the United Nations Committee on the Peaceful Uses of Outer Space Expert Group on space weather. In line with recommendations of the Expert Group, Canada has performed a socioeconomic study to assess the impacts of space weather on Canadian infrastructure and will share its conclusions with the Committee on the Peaceful Uses of Outer Space in 2020.

Space Situational Awareness (SSA)

Canada's Department of National Defense (DND) continues to operate Sapphire, an operational space-based SSA sensor. Sapphire currently contributes 2000–3000 metric observations/day on deep-space objects to the larger US-led Space Surveillance Network (SSN) helping maintain the safety of space objects in Earth orbit. The Surveillance of Space 2 project, the follow-on to Sapphire, is in the initial planning stages at DND. This capability will continue to provide tracking data to the SSN. The project plans to develop a new space-based sensor designed to detect smaller debris objects in geosynchronous orbits in a more responsive manner than Sapphire. The project is also planning two or more ground-based optical tracking facilities developed and deployed within Canada as risk mitigation for the space-based system.

In addition, Canada continues to advance space situational awareness R&D using NEOSSat by maintaining near continuous tracking of man-made objects in geostationary orbit. NEOSSat also routinely performs LEO-to-LEO (Low Earth Orbit) tracking, a unique capability in the field, which uniquely allows NEOSSat to collect tracking data on space objects making close approaches (conjunctions), including objects conjuncting with NEOSSat itself. LEO-to-LEO in-situ observations of close approaches has never been demonstrated before, and a paper detailing the applicability of this technique to reducing spacecraft collision risks earned the Best

Paper Award at the prestigious Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference in September 2019.

In July 2019, DRDC issued a request for proposals to develop a new SSA microsatellite intended for technology demonstration of advanced SSA capabilities in LEO. This mission will expand upon the deep-space (geosynchronous) satellite tracking capabilities of NEOSSat, by testing: 1) resolved imaging of the exterior surfaces of Canadian satellites, 2) high performance attitude control to track space objects, 3) near-real time tasking of the SSA microsatellite nearly anywhere in LEO and 4) sensors to enable the microsatellite to have proximity awareness of space objects in its orbital vicinity. Launch of the SSA microsatellite is forecasted for the 2024 timeframe.

The CSA's Conjunction Risk Assessment and Mitigation System (CRAMS) continues to provide its users with invaluable analysis of conjunction data delivered by the United States 18th Space Control Squadron. The CRAMS reports are used by satellite operators and the Canadian Space Operations Centre (CANSpOC) to facilitate good decision-making and ensure the protection of space assets against space debris. Following additional requests from Canadian industry, academia and international partners, CRAMS now supports a total of 75 space assets both from LEO and Geostationary Orbit (GEO) missions and remains an essential space situational awareness asset in Canada.

Canada applauds the recognition, by the United Nations, of Committee on the Peaceful Uses of Outer Space's approval of the Guidelines for the Long-Term Sustainability of Outer Space Activities and has begun the process of evaluating our current level and identifying ways of increasing our future level of implementation. Canada looks forward to reporting on our implementation of the Guidelines and learning best practices from other Member States, at future sessions.

The CSA organized and hosted the OECD Economics of Space Debris Workshop in collaboration with NASA on June 19–20, 2019, at CSA HQ in Montreal. The event included 45 participants from 18 organizations (government, academia and industry) with nine countries represented from North America, Europe and Asia. The five panel sessions explored issues related to the tragedy of the commons; the current state of the space environment; risk mitigation cost; managing space debris in the future – costs and opportunities; and policy and law decisions – informed by economic indicators. The OECD Space Forum published the "Space Sustainability – Economics of Space Debris in Perspective". The report includes original OECD research and the findings of the workshop on the Economics of Space Debris.

Finally, related to meteorites and space debris re-entry, several Canadian universities are collaborating with international colleagues in "all-sky camera networks", collecting observations on incoming debris/meteorites for logging and recovery purposes.

Earth Observation

The three satellites of Canada's RADARSAT Constellation Mission (RCM) were successfully launched on June 12, 2019. RCM represents the evolution of the RADARSAT Program and ensures C-Band SAR data continuity. RCM data uptake to support government of Canada activities is expected to reach 50 times that of RADARSAT-1 while providing new applications enabled by the constellation approach. Canada continues to support the free and open access to its satellite data and has released a first set of RADARSAT-1 data record, while supporting free access to RCM data.

The CSA continues to support a large number of R&D activities with industry, government and academia using RADARSAT-2 data both nationally and internationally. RADARSAT-2 continues to support the Government of Canada in its mandate to monitor the impacts of climate change, protect our environment and foster sustainable development, manage natural resources, and support disaster relief.

STEM

The CSA is using space to engage young Canadians in science, technology, engineering and math (STEM) studies and careers and took advantage of the astronaut David Saint-Jacques' six-month mission in space to invite young Canadians to participate in STEM activities.

As part of Canada's participation in the Lunar Gateway, the CSA launched the Junior Astronauts campaign in 2019 to engage young Canadians, get them excited about future careers in the space field, and help them understand how they can play a role in Canada's mission to the Moon. Online content and learning games were made available to all young Canadians. Structured activities in science and technology, fitness and nutrition, and teamwork and communications were also developed. Qualified participants from across Canada will be chosen randomly to take part in a camp in summer 2020, during which they will join astronauts, scientists and engineers for a week of space training.

The CSA also continued the Canadian CubeSat Project (CCP), where over 450 post-secondary students, from across Canada, are taking part in a real space mission, by designing, building, launching, and operating their own CubeSat over a three-year period. The main objective of the CCP is to provide professors in post-secondary institutions with an opportunity to engage their students with real space missions. Once tested and ready for space, the CubeSats will be launched to and deployed from the ISS. The teams will then operate their satellites and conduct science according to their mission objectives, which could last up to 12 months.

Capacity Building

The CSA continued to support initiatives and activities related to space science and technology development to attract, sustain and enhance a critical mass of Canadian space specialists; reduce technological unknowns; foster space innovation and know-how; preserve Canada's space-related capabilities; and increase commercial potential. In particular, the CSA invested over $20M CAD for the development and maturation of nearly 50 space technologies and over $6M CAD to support over 30 space related research projects in Canadian post-secondary institutions. The CSA also carried out pre-mission research and technology activities and supported various pre-space capability demonstration opportunities to raise the space readiness of Canadian science and technology, while training post-secondary students in the field of space science and technology. Finally, the CSA renewed the Canada-European Space Agency (ESA) Cooperation Agreement for another 10 years and committed to future investments in ESA programs.

Support to Global Challenges

The CSA and the Public Health Agency of Canada (PHAC) continue to apply Earth observation satellite data and derived geospatial information to advance research efforts and risk assessments within the Canadian public health domain. Efforts have been focused on mosquitos borne diseases, Lyme disease and vulnerable human population.

With its large landmass, Canada counts on its longstanding use of satellite imagery and collaborative work with national and international partners to support the global data challenge for the Sustainable Development Goals. Canada participated in the review and development of two initiatives under the Group on Earth Observations (GEO) and the Committee on Earth Observation Systems (CEOS) promoting the use of Earth observations and geospatial information to support progress on the Sustainable Development Goals.

The CSA has been working closely with international partners as part of disaster relief programs, making our Earth observation data available in times of crisis, helping to assess impact and mitigate risk for natural disasters. Canada's RADARSAT-2 continues to actively support the International Charter Space & Major

Disasters, a collaboration founded by ESA, CNES and CSA that has now grown to seventeen (17) members. From January to September 2019, there were 29 activations of the Charter, including one from Canada. In May 2019, CSA hosted the 41st meeting of the Charter members and assumed responsibility as the Charter's lead agency for a six-month period.

Socioeconomic Benefits of Space Utilization

In 2018, the CSA commissioned a study to better measure the socioeconomic value of space utilization that benefits Canadians, both of a quantitative and qualitative nature, across three key domains: satellite communication, satellite navigation, and Earth observation (EO). A series of metrics and indicators were developed to provide data on six key topic areas. Select examples of benefits and growth are noted below:

- Disaster Management – The Canadian government has activated the International Charter, Space and Major Disasters 13 times, in order to receive imagery to support monitoring of disasters on Canadian territory. Example – SAR data was utilized to monitor and support relief efforts of the Quebec 2017 flooding, and the 2016 Fort McMurray Wildfires.
- Agriculture – Using satellite navigation (GPS) enabled farming equipment to support precision agriculture has saved farmers $500–550 million/year in terms of improving yield, and more efficient use of seeds, fertilizer and irrigation.
- Air Traffic Management – Cumulated reduction of approximately 30 million tons of CO2 equivalent emission across the whole of Canadian controlled airspace by 2027 through the implementation of ADS-B and resulting more efficient flight routes.
- Environmental Monitoring – Over 200 oil anomalies detected by the CIS I-STOP services over 2013–2017, 39 of which were validated as discharge from ocean-going vessels.
- Rural/Remote Communities – Over 200,000 households located in rural and remote areas of Canada are connected to the internet by satellite. 77 indigenous communities in Northern Canada rely solely on satellite links, which is critical for connecting households, schools, medical centers and banks to the internet and other parts of Canada.
- Transport/Logistics/Internet of Things – An improved container utilization enabled by space-based IoT translates into a $170 million cost savings to the Canadian maritime industry by 2025.

The Socio-Economic Benefits of Space Utilization report was released in the fall of 2019 and will be presented during the Scientific and Technical Subcommittee in 2020. The report included dozens of new indicators relaying the benefits of space utilization for Canada and the world.

State of the Canadian Space Sector Report 2018

The State of the Canadian Space Sector Report provides factual information about the Canadian space sector. The annual report is based on a questionnaire sent to companies, not-for-profit organizations, research centres and universities with space-related activities in Canada. The 2018 report includes data from 2017 on organizations composition, sectors of activity, the Canadian space workforce, research and development (R&D), and innovation.

Link to report: *www.asc-csa.gc.ca/eng/publications/2018-state-canadian-space-sector.asp*.

Key Takeaways:

- In 2017, the space sector contributed $2.3B to Canada's GDP and supported a total of 21,828 jobs.

- Total revenues in the Canadian space sector reached $5.6B.
- The Canadian space workforce totalled 9,942 space-related full-time equivalents (FTEs), of which 43 per cent were highly qualified personnel (HQP).
- Business Expenditures on R&D (BERD) reached $363M, a 43 per cent increase from the previous year.
- Canadian space companies derived $330M in revenues through the commercialization of externally funded R&D projects, a significant growth from 2016.
- Space sector organizations reported a total of 203 inventions and 118 patents.
- Canada's top 30 space organizations accounted for 97 per cent space revenues, 81 per cent of space employment, 88 per cent of BERD, 65 per cent of patents, but only 32 per cent of inventions.

Finland

[Original: English]
[2 December 2019]

1. Revised National Space Strategy

Finnish space activities are based on Finland's National Space Strategy. The National Space Strategy was revised in 2018 by a working group with a mandate extending to 31 October 2018. The working group had a task of preparing a proposal for the new measures in the Finnish space strategy to promote growth and employment as well as assessing how Finnish space administration should be organized to best promote the creation of an attractive operating environment in Finland.

The working group recommended developing national space administration towards a more centralised structure. In this respect, the Finnish Space Committee was renewed to enhance the coordination and preparation of space related matters. The Government appointed the new Finnish Space Committee for a three-year term from September 2019 to September 2022. The Space Committee acts as an advisory body in matters related to space policy and the space sector, including the adoption of the national space strategy, follow-up of strategy implementation, and defining the guidelines and priorities for Finland's international influencing. The Space Committee is supported by secretariat established by the Ministry of Economic Affairs and Employment.

The tasks of space administration are to coordinate Finland's international representation and impact. The revised strategy includes several measures to enhance international cooperation. The Finnish Space Committee is to map out the Finnish representatives in international bodies, expert groups and standardisation organizations and to coordinate the nomination and activities of the representatives. The ministries involved in the Space Committee participate in the workings of several international cooperation bodies such as the European Union (EU), the European Space Agency (ESA) and the Committee on the Peaceful Uses of Outer Space, promoting especially the sustainable use of space, new business opportunities and security aspects.

2. The Finnish Satellites

The Ministry of Economic Affairs and Employment authorises and supervises space activities carried out by Finnish entities, and maintains a national registry of

space objects. In November 2019, Finland's registry of space objects contains seven satellites in total.1

3. International Collaboration

The Finnish industry and research organizations participate actively in European Space Agency's programmes, in particular Earth Observation, Navigation, and Advanced Research in Telecommunications Systems (ARTES).

ESA Business Incubation Centre in Finland assists Finnish entrepreneurs and start-ups financially and technically, for instance by introducing new technologies to the ESA and its partner network or transferring existing ESA space technologies from hardware to data.

In addition to opportunities offered by ESA, Finnish experts participate in opportunities offered by the European Meteorological Satellite Organization (EUMETSAT), the rapidly increasing EU space activities and the European Southern Observatory (ESO). Finnish space sector is widely networked with international space organizations, research institutes and universities as well as private industries and service providers. Furthermore, the EU Space Programme and bilateral collaborations continue to have a significant role in the Finnish space program. The most significant partners are the two neighbouring countries Russia and Sweden, but important cooperation has been carried out with the United States and Canada, and more recently with Japan and India.

Business Finland's New Space Economy programme facilitates the creation of new projects and partnerships by linking Finnish companies with international partners. The programme forms a platform for initiating, promoting and continuing international co-operation and supports creation of new ecosystems in Finland. The number of new Finnish space related companies grows steadily, and the goal is to have 50 start-ups entering space related business by 2022.

The Finnish Government's analysis, assessment and research activities are to secure that preparation and implementation of policies and the related decision-making in Finland are based on well-researched information. In 2019, the Finnish Government is funding a project with the aim of identifying the benefits and market potential for the Finnish society and business as well as safety and security aspects with regard to the rapidly evolving space sector. The project runs from February 2019 to November 2019 resulting in a policy brief and a final report to be utilised by, not only the space administration, but more commonly within the public sector to enhance a greater understanding on the benefits and risks relating to the increasing significance of space and space applications.

4. Finland's Presidency of the Council of the European Union

During its presidency of the Council of the European Union from 1 July to 31 December 2019, Finland emphasises that sustainability should be the common denominator for all EU actions. The priorities of the Finland's Presidency are to strengthen common values and the rule of law, to make the EU more competitive and socially inclusive, to strengthen the EU's position as a global leader in climate action, and to protect the security of citizens comprehensively.

Regarding space policy matters specifically, during its Presidency, Finland advocates the importance of space solutions for the Arctic and increasing the understanding of sustainable use of outer space. The European Space Week 2019 is organized by the European Commission under the auspices of Finland's Presidency of the Council of the EU and will take place in Helsinki from 3 to 5 December 2019.

[1] Ministry of Economic Affairs and Employment of Finland, *National Space Objects Registry* https://tem.fi/en/registry-of-space-objects.

5. Finland's Chairmanship of the Arctic Council in 2017–2019

As the Chair of the Arctic Council in 2017–2019, Finland emphasised the implementation of the Paris Agreement on climate change and the United Nations sustainable development goals (SDGs) in the Arctic cooperation. During its term, Finland aimed to strengthen the Arctic cooperation and its continuity at the highest political level. The priorities of the Finnish chairmanship were Environmental Protection, Connectivity, Meteorological Collaboration and Education, in each of which activities in space have a role to play. The Ministry for Foreign Affairs coordinates the activities in collaboration with other ministries and various stakeholders.

Myanmar

[Original: English]
[12 January 2020]

The Government of the Republic of the Union of Myanmar has formulated a space programme aimed at consolidating the aspirations of launching national satellites and gaining control over strategic national communications and broadcasting. A second aim is to create a commercially viable and sustainable satellite-based communications industry in Myanmar, building a selective position in regional and multiregional markets.

In this respect, the Republic of the Union of Myanmar selected the satellite operator Intelsat and signed on 27 May 2016 for the lease of satellite capacity through a five-year agreement on satellite service as the name of MyanmarSat-1 (MyanmarSat-1a from Intelsat 902 located at 62 degree East and MyanmarSat-1b from Intelsat 906 located at 64.15 degree East).As mentioned in the agreement, the agency (the Information Technology and Cybersecurity Department of Ministry of Transport and Communications) have ability to operate a portion of the payload of those two satellites. This activity is a first step of Myanmar Space Programme.

As the second step, according to the approval of Government, the indefeasible right of use (IRU) agreement between Information Technology and Cyber Security Department, Ministry of Transport and Communications and Intelsat for the MyanmarSat-2 Satellite payload was signed on 1 June 2018. In accordance with terms and conditions in the IRU agreement, the Republic of the Union of Myanmar has the rights to use the satellite services from Intelsat-39 Satellite as below:

- Bandwidth : 6 x 72 MHz C-Band and 6 x 72 MHz Ku band
- Orbital location: 61.95 degree East
- Beam: C-Band spot beam and Ku-band steerable spot beam for Myanmar
- Investment Price total: US$ 155.7 million, to be paid in 8 quarterly payments.
- Satellite name: Intelsat 39 (MyanmarSat-2)
- Quality & Coverage: it is a high-power geostationary communication
- Satellite that will have broadband networking and video distribution services in
- Africa, Europe, the Middle East and Asia
- Construction platform & Manufacturer : built on the Space System Loral SSL-1300 platform by Maxar Aerospace company
- Launch provider: Arianespace at French Guiana in August 7, 2019
- Satellite life time: about 15 years.

Intelsat satellite IS-39 including MyanmarSat-2 was successfully launched on 7 August 2019 by Ariane space in French Guiana with the use of Ariane 5 Rocket,

now it is operating on its orbital location of 61.95 degree East. The satellite service of MyanmarSat-2 was starting on 15 October 2019.

With this second step of Myanmar Space Programme, the MyanmarSat-2 services can effectively provide the requirements in the sectors of e-Government, e-Health, e-Tourism, e-Education, border security management, disaster management, and disaster response, rescue and resilience.

The third step of the Myanmar Space Programme is to launch a national satellite for Earth observation Micro Satellite in December, 2020. The Earth Observation Satellite project will be undertaken by Myanmar Aerospace Engineering University and cooperation with Hokkaido University, Japan. By this project, Myanmar can carry out in the area of technologies (a) construction of a spacecraft bus,(b) payload and sensors,(c) ground control station and (d) utilization of space technology. After that, Myanmar can produce and control the satellite on its own.

In this EOS project, two 50 kg micro satellites has been planned to launched into the low-earth-orbit. The overall estimated cost for two satellite is about US$ (15.3) million. The first EOS will be constructed and launched in Japan and the second one will be constructed in Myanmar.

Within five years, Myanmar can launch two satellites and they can be used for seven years lifetime. The space center can be established at the Myanmar Aerospace Engineering University. We will get the sky photos of the whole country, taken daily photos from the high resolution cameras. The use of satellite images, remote sensing and geographic information system technologies will be greatly beneficial for each ministry of the country.

Using space technologies may affect international peace, safety and security. Therefore, the Government may undertake to ensure the peaceful, safe and secure continuity of space activities while operating the Myanmar National Earth Observation Satellite project. For the peaceful uses of outer space, Myanmar will take part as a participant for the regional and global development of present and future space science technology.

Myanmar's 2019 Activities

Department of Meteorology and Hydrology (Meteorology Division)

Myanmar is exposed to multiple natural hazards which include Cyclone, Storm Surge, Floods, Landslide, Earthquake, Tsunami, Drought, Fire and forest Fire. Its coastal regions are exposed to cyclones, storm surges and tsunamis while major parts of the country are at risk from earthquakes and fires. The rainfall-induced flooding is a recurring phenomenon across the country while some parts of the country are exposed to landslide and drought risks. The cyclone Nargis (2008) was the worst natural disaster in the living memory of Myanmar.

Role of DMH in Disaster Management

The Department of Meteorology and Hydrology (DMH) has three divisions viz. Meteorology, Seismology and Hydrology. The DMH has been designated as the focal point for early warning. DMH coordinates with RRD to provide information on early warning. The early warning is based on daily weather forecast and analysis of the data received from the meteorological satellites. The early warning information dissemination to media is provided in 5 stages depending on the threat level, protocol for which is already defined. The data is collected from about 150 meteorological stations (hydro and agro-meteorology).

Use of space and geospatial technologies in DMH

The daily weather forecast and early warning provided by the DMH is based on the meteorological satellite data from Japan. Currently there is no capacity in using earth observation satellite data. However, considering the key role of DMH in Multi-hazard Risk Assessment, developing the capacity in remote sensing is a critical factor.

With such capacity, the DMH will be also able to provide improved drought warnings based on the free drought monitoring products available from NOAA and other satellites. The satellite receiving station installed (MTSAT and SATAID) at Naypyitaw since December, 2010 by donated JICA. Therefore, the Himawari -8 updated every 10 minutes observations on 14 December, 2015. DMH also use other web based sale images like NOAA, FY, JAXA Global Rainfall Watch and Sentinel ASIA (JAXA), AIT (GIC). Since DDM is the focal Department of The Office for Outer Space Affairs and UN SPIDER, DDM is taking as the Authorized Department. Therefore, in future, the satellite pictures as well as RS images should be shared to DMH via DDM. To do this, DMH Early warning will be improved.

Recommendations

Finally, generating space-based information products requires specialized skills. To be successfully used in Myanmar, it requires strong institutional support through appropriate disaster management strategy, clear data sharing arrangements, and a great willingness to cooperate with DMH.

In DMH, there is urgent need to support for satellite imagery and its technologies by the Office for Outer Space Affairs and from its branches. DMH should be able to strengthen its capacity provide near real time forecasting of cyclone and relevant disaster early warnings space technology will play a major role in achieving such capability, although it needs to expand the usage of space based technology.

Usage of Space Technology and Satellite Images in Hydrological Division

Space technology has emerged as the most powerful tool for decision making in flood disaster management and happens to be a critical source of information, on flood inundation, and damage assessment. Satellite images provide vital information required by the decision makers at different phases in flood disaster cycle such as preparedness (pre-flood), relief and rescue operations (during flood) and mitigation measures (post flood). Earth Observation Satellites missions like IRS, Radarsat, ENVISAT, ERS, Landsat, MODIS and SPOT provide data in a variety of spatial, spectral and temporal resolutions very useful for mapping and monitoring flood events in near real-time and operational mode.

Hydrological division is generating space based flood mapping from local to national scale to implement the roles of preparedness and management on disaster. The extent of flood inundation is extracted from the satellite data and flood maps at various scales i.e. state, district and detailed levels are prepared for the flood affected area and disseminated to the stakeholders, decision makers and line departments.

Advanced science and technology, particularly space technology applications, enabled for flood forecasting, however gap in the capacity of advanced technique in flood forecasting including in flood monitoring systems, limited data and inadequate institutional and capacity development need to fill.

Peru

[Original: English]
[14 January 2020]

Peru recognizes the importance for humanity of outer space as a means for the development of nations and for contributing to the achievement of the Sustainable Development Goals of 2030 Agenda, the Paris Agreement and the Sendai Framework. In that regard, we share the common interest of States in responsibly increasing the exploration and use of outer space for peaceful purposes, by virtue of the present and future benefits that can be generated.

In that regard, we believe it important to provide below a summary of national space activities:

General Issues

Peru shares humanity's common interest in increasing the exploration and use of outer space for peaceful purposes and considers international cooperation to be the key to guaranteeing access to that means for all. Peru also considers it necessary to strengthen the existing international legal framework on this subject.

Peru has been working in a multisectoral manner, involving all national actors related to space issues in the design and development of a National Space Policy. In that regard, efforts are being made to seek ways of increasing knowledge of issues relating to international space law, the guidelines established by the United Nations on that subject as well as the international trends and priorities relating to the regulation of space activities, which may serve as a guide in the development of the aforementioned National Space Policy.

Participation of Peru in international organizations

Peru is a founding State member of the Asia-Pacific Space Cooperation Organization (APSCO) and this year has assumed the first vice-presidency of the organization, consequently, one of its objectives is to deepen international cooperation in training, the execution of projects and the development of public policies for the peaceful use of outer space.

In the framework of APSCO, Peru has been working on a project entitled "The Validation Field Campaign of Radiometric Calibration of Satellite Sensors", in which institutions from Turkey, Iran, Pakistan, Thailand and China are participating; and as part of the activities of that project, a field campaign was conducted in Peru in October 2019. The purpose of the work in this project is to identify a calibration site in Peru for the validation of the data from the Peruvian satellite PeruSAT-1.

Peru is also a member of the Group on Earth Observations (GEO), supporting through this organization the use of data obtained through Earth observation satellites; in particular, through the increasing use at national level of the images from the PeruSAT-1 satellite launched in September 2016. This work is reinforced by Peru's role as a member of the Board of Directors of the American Chapter of GEO (AmeriGEO).

Coordinated activities with the United Nations, and other foreign institutions

In April 2019, the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) programme carried out a technical advisory mission in Peru. During it, 20 institutions were visited, with the aim of collecting information that would make it possible to identify institutional strengths and weaknesses in the access to and subsequent use of information derived from satellite applications to contribute to various activities carried out in all phases of the disaster management cycle.

Peru has been actively working with various entities to facilitate stratospheric balloon flights. At present, Google's Project Loon balloons have flown over Peruvian airspace to conduct feasibility studies on internet connectivity to rural and remote areas, and balloons from France's Centre National d'Études Spatiales (CNES) for scientific purposes, for the study of climate change. In this way, Peru reaffirms its commitment to humanity's goal of maximizing the use of air and space for technological and scientific purposes for the benefit of people.

Local activities

The Peruvian Space Agency develops activities in the field of Space Sciences, through projects to measure high energy and space weather, observation of near-earth objects and astronomy studies; in the field of Space Technology Development, through the development activities of probe rockets and payloads; in the field of Space Technology Applications, through geomatics projects and the provision of satellite images of PerúSAT-1, and in the field of Space Education and Training through the

organization of training courses and dissemination events on the use of satellite images aimed at socioeconomic development.

In November 2019, the Peruvian Space Agency – CONIDA held the III International Workshop "PerúSAT-1: Lessons Learned", an event that brought together 73 national institutions and 8 foreign delegations, and whose aim was to disseminate the advances in the use of satellite images by public institutions and academia.

On 13 and 14 November 2019, the Peruvian Air Force held the first International Symposium on Defence and Security, entitled "The Aerospace Power and its Contribution to National Development". This event dealt with very important topics such as the strategic use of space and the use of aerospace means in the protection of the environment. The aforementioned event showed how space technology is used in favour of national development, environmental protection and disaster risk management, among other uses.

The Geophysical Institute of Peru (IGP) carried out during 2019 different projects related to the study of the high atmosphere, which include the implementation of a meteorological radar detection system called SIMONE dedicated to the measurement of low thermosphere winds.

A multi-static radar system operating in the HF band was also implemented. It has different transmission and reception stations, and its data is used to estimate plasma densities in the lower part of the ionosphere. We should also mention that the project for the Development of Instrumentation for Nanosatellites and Ionospheric Measurements was concluded with funding from Innóvate Perú, which meant an important step for the development of space instrumentation that contributes to scientific research in the country. The aim of the project was to develop, design and build a transmitter system for nanosatellites and satellite earth receiving stations that are useful for carrying out research of the upper atmosphere.

It is worth mentioning that the IGP, in the development of its geospatial study activities, has the Jicamarca Radio Observatory, one of the main scientific facilities at the international level dedicated to the observation and study of the ionosphere and upper layers of the atmosphere. Likewise, it is the competent organism for the realization of activities oriented to scientific research, education and training, monitoring of geophysical phenomena, provision of services, technological development and realization of studies and projects, in the diverse areas of geophysics, in order to contribute with the management of risks of disasters at national level.

Russian Federation[2]

[Original: Russian]
[27 October 2019]

Проект ежегодного доклада об итогах космической деятельности России за 2019 г.

В 2019 г. Россия реализует космическую деятельность по всему спектру её направлений, определенных в Законе Российской Федерации от 20 августа 1993 г. № 5663-1 (в редакции от 15 апреля 2019 г.) «О космической деятельности», в соответствии с целями и задачами, установленными в документах стратегического планирования в данной области в обеспечение исследования, освоения и использования космического пространства для обеспечения национальной безопасности, социально-экономического развития страны и

[2] A summary of the full report is available in all the official languages of the United Nations and may be found in document A/AC.105/1211/Add.2.

получения новых научных знаний, развития взаимовыгодного международного сотрудничества в сфере использования космического пространства в мирных целях.

В целях обеспечения государственных интересов Российской Федерации в области космической деятельности, закрепленных в Основах государственной политики Российской Федерации в области космической деятельности на период до 2030 года и дальнейшую перспективу, в рамках реализации Государственной программы «Космическая деятельность России на 2013–2020 годы» в 2019 г. решаются следующие задачи:

обеспечение гарантированного доступа России в космос со своей территории;

использование космических средств в интересах развития социально-экономической сферы;

создание информационных полей, обеспечивающих на всей территории страны непрерывную связь, телерадиовещание, навигацию, оперативное получение данных наблюдения Земли и атмосферы из космоса;

получение научных данных о космосе, Земле и других небесных телах для развития фундаментальной науки;

достижение и поддержание лидирующих позиций на наиболее значимых научных направлениях, в том числе в исследовании Луны, Марса, других тел Солнечной системы;

обеспечение возможности полноценного участия в проектах международного сообщества по исследованию, освоению и использованию космического пространства;

наращивание и использование конкурентных возможностей и преимуществ России в сфере космической деятельности;

становление и развитие коммерческого сектора отечественной космической деятельности.

На постоянной основе ведется работа по поддержанию и наращиванию отечественной орбитальной группировки космических аппаратов (КА) социально-экономического, научного, двойного и оборонного назначения.

Россия располагает необходимой номенклатурой средств выведения, которые обеспечивают запуск полезных грузов массой от нескольких сотен килограммов до 23 тонн на околоземные орбиты различных наклонений.

Российской Федерацией за 2019 г. (по состоянию на 11 сентября 2019 г.) осуществлены 14 пусков ракет-носителей (РН) с целью вывода на орбиты 49 космических аппаратов (КА) различного целевого назначения, из них 19 отечественных КА и 30 зарубежных КА, в том числе:

- по Федеральной космической программе – 7 КА («Союз МС-12», «Союз МС-14», «Прогресс МС-11», «Прогресс МС-12», «Ямал-601», «Метеор-М» №2-2, «Спектр-РГ»);
- по Федеральной целевой программе ГЛОНАСС – 1 КА («Глонасс-М» №758);
- внебюджетных – 4 КА («Союз МС-13», «Сократ», «АмурСат», «ВДНХ-80»);
- по коммерческой программе запусков – 30 КА (зарубежные).

Пуски РН осуществлялись с космодромов Байконур, Плесецк и «Восточный».

Кроме того, с космодрома Гвианского космического центра был произведен пуск двух ракет-носителей «Союз-СТ-Б» с разгонным блоком «Фрегат-М»

российского производства, которые вывели на расчетные орбиты 10 КА перспективных зарубежных негеостационарных спутниковых систем связи и передачи данных OneWeb и O3b (6 КА OneWeb и 4 КА O3b).

Продолжаются работы по созданию перспективных средств выведения серии «Ангара» и РН «Союз-5», а также по созданию и улучшению эксплуатационных характеристик пилотируемого космического корабля нового поколения «Федерация».

Практически завершен первый этап строительства обеспечивающей инфраструктуры космодрома «Восточный». В рамках создания второй очереди по основным объектам (стартовый комплекс и унифицированный технический комплекс космического ракетного комплекса «Амур») выполнены проектно-изыскательские работы, завершается прохождение государственной экспертизы проектно-сметной документации.

Головной подрядной организацией (производственно-строительное объединение «Казань») начаты строительно-монтажные работы на месте стартового комплекса, который будет построен на первом этапе создания второй очереди космодрома.

В 2019 г. продолжены работы по поддержанию и развитию орбитальной группировки спутников связи, вещания и ретрансляции, которая включает КА связи и вещания серии «Экспресс» и «Ямал», «Луч-5» многофункциональной космической системы ретрансляции «Луч» и «Гонец-М» многофункциональной системы персональной спутниковой связи и передачи данных «Гонец-Д1М».

Космические аппараты серий «Экспресс» и «Ямал» обеспечивают предоставление услуг фиксированной спутниковой связи, телерадиовещания, широкополосного доступа в Интернет, организации ведомственных и корпоративных сетей связи, подвижную президентскую и правительственную связь.

В 2019 г. запущен изготовленный французской компанией Thales Alenia Space КА «Ямал-601» – коммерческий телекоммуникационный спутник большой размерности на геостационарной орбите, принадлежащий российскому спутниковому оператору «Газпром космические системы».

Многофункциональная система персональной спутниковой связи «Гонец-Д1М» обеспечивает в глобальной зоне передачу данных о состоянии и местоположении различных объектов (в том числе, подвижных и опасных грузов), экологический и промышленный мониторинг, связь в чрезвычайных ситуациях и при стихийных бедствиях.

Многофункциональная космическая система ретрансляции «Луч» создает возможности в реальном масштабе времени управлять полетом низкоорбитальных КА и передавать с них целевую информацию независимо от их расположения на орбите, осуществлять прием телеметрической информации с РН и разгонных блоков (РБ).

В ближайшем будущем планируется развитие данных систем, а также развертывание коммерческих орбитальных группировок КА типа «Полярная звезда».

Развиваются космические технологии мониторинга, обнаружения, прогноза и контроля опасных явлений (ураганы, штормы, тайфуны, наводнения, ледовые образования и т.д.) по данным КА типа «Метеор-М», «Электро-Л», «Канопус-В», «Ресурс-П». Значительное развитие получило направление по обнаружению и контролю лесных пожаров по данным КА типа «Канопус-В», «Метеор-М» и «Ресурс-П».

Продолжены работы по формированию главного информационного центра ДЗЗ и его инфраструктуры. Созданы новые станции приёма, обработки и архивации данных, организована система сбора данных по территории Евразии.

Госкорпорацией «Роскосмос» реализуется проект «Цифровая Земля» по созданию единого бесшовного сплошного покрытия данными ДЗЗ территории Российской Федерации и других стран. Проект «Цифровая Земля» должен позволить уже к 2021 г. предоставить российским потребителям возможность свободного доступа к данным ДЗЗ и к сервисам, создаваемым на их основе.

В 2019 г. основные характеристики системы глобальной навигационной спутниковой системы ГЛОНАСС поддерживались на конкурентоспособном уровне. Точность определения координат обеспечена на уровне 2,7 метра, интегральная доступность навигационного сигнала составляет 99,8 % на территории России и 98,9 % глобально. Орбитальная группировка ГЛОНАСС включает (по состоянию на 11 сентября 2019 г.) 27 КА, из которых 20 КА «Глонасс-М» и 1 КА «Глонасс-К» используются по целевому назначению, три КА «Глонасс-М» временно выведены на техобслуживание, два КА «Глонасс-М» находятся в орбитальном резерве, один КА «Глонасс-К» проходит летные испытания. В 2019 г. запущен и введен в штатную эксплуатацию один навигационный спутник «Глонасс-М».

В интересах гражданских потребителей введена в эксплуатацию система контроля подтверждения характеристик радионавигационного поля системы ГЛОНАСС первой очереди.

Выполняются в полном объеме международные обязательства Российской Федерации по транспортно-техническому обеспечению и эксплуатации МКС, а также программа реализации научно-прикладных исследований и экспериментов на 2019 г. на российском сегменте МКС. По программе 2019 г. осуществляются запуски трёх автоматических грузовых кораблей серии «Прогресс МС» и четырёх пилотируемых кораблей серии «Союз МС» (из них один запуск – в беспилотном (грузовозвращающем) варианте), с помощью которых планируется доставка на МКС трёх российских космонавтов, четырёх астронавтов НАСА, одного астронавта ЕКА, одного астронавта Объединенных Арабских Эмиратов, а также научной аппаратуры, топлива и другие грузов.

Успешно продолжается выполнение научных экспериментов в космосе с использованием российских приборов на борту зарубежных КА. Примерами глубокой кооперации с зарубежными партнёрами является реализация российских научных проектов:

- «РадиоАстрон» на базе отечественного КА «Спектр-Р» с привлечением более 30 иностранных наземных радиотелескопов;
- астрофизическая обсерватория ультрафиолетового диапазона «Спектр-УФ», в создании научной аппаратуры которой участвуют организации Испании;
- российско-германский проект «Спектр-Рентген-Гамма» («Спектр-РГ»).

13 июля 2019 г. состоялся успешный запуск космической астрофизической обсерватории «Спектр-РГ». В настоящее время обсерватория продолжает полет в окрестность точки Лагранжа L2 системы «Солнце – Земля».

Космический аппарат «Спектр-РГ» создан с участием Германии в рамках Федеральной космической программы России по заказу Российской академии наук. Обсерватория оснащена двумя уникальными рентгеновскими зеркальными телескопами: ART-XC (ИКИ РАН, Россия) и eROSITA (MPE, Германия), работающими по принципу рентгеновской оптики косого падения. Телескопы установлены на космической платформе «Навигатор» (НПО Лавочкина, Россия), адаптированной под задачи проекта.

Первые научные данные с телескопа ART-XC получены 24 июля 2019 г.

Наиболее масштабным стал российско-европейский проект изучения Марса «ЭкзоМарс». Идёт подготовка реализации второго этапа –

«ЭкзоМарс-2020», в рамках которого планируется проведение программы исследований Марса как с использованием возможностей дистанционного зондирования, так и с борта европейского марсохода и российской посадочной платформы.

Продолжаются работы по проектам исследования Луны автоматическими космическими аппаратами «Луна-Глоб», «Луна-Ресурс-1» (орбитальным и посадочным аппаратами). Реализация данных проектов позволит провести комплексные исследования реголита и условий на поверхности Луны около её южного полюса, изучение экзосферы Луны контактными методами, комплексные контактные исследования на поверхности Луны, включая бурение на глубину 1–2 м и анализ образцов реголита.

С целью повышения эффективности обеспечения длительных пилотируемых полетов в космосе на орбите с повышенной радиационной нагрузкой продолжается подготовка проекта запуска космического аппарата-биоспутника «Бион-М» № 2. Запуск космического аппарата запланирован на 2023 год.

В рамках решения задачи развития коммерческого сектора отечественной космической деятельности продолжены работы, обеспечивающие развитие навигационных сервисов и навигационного оборудования, подвижной спутниковой связи, ДЗЗ и бизнесов на основе данных ДЗЗ, проводятся мероприятия в обеспечение создания компаний по перспективным направлениям развития бизнеса и продуктовым линейкам, создания экспортера в сфере пусковых услуг и оператора по оказанию услуг на РС МКС. Реализуются процессы организационно-структурного и функционально-технологического формирования первой в России коммерческой компании “S7 SPACE”, нацеленной на предоставление полного цикла услуг по запускам космических аппаратов в обеспечение растущих потребностей мирового рынка пусковых услуг путем экономически эффективного использования ресурсов космодрома «Морской старт» и сокращения сроков реализации проектов.

Разработаны новые подходы к планированию и проведению целевых работ на МКС, которыми предусмотрено расширение состава участников, реализующих научные эксперименты и исследования на пилотируемых космических комплексах.

Российская Федерация уделяет большое внимание вопросам снижения засоренности околоземного космического пространства. С 2016 г. осуществляется эксплуатация сети оптико-электронных средств Автоматизированной системы предупреждения об опасных ситуациях в околоземном космическом пространстве (АСПОС ОКП), которая обеспечивает выявление опасных ситуаций в ОКП, сближения с потенциально опасными космическими объектами, прогнозирование сходов с орбит, падений космических объектов и риска с определением времени и возможного района падения. С 1 января 2019 г. введена в действие новая редакция национального стандарта Российской Федерации ГОСТ Р 52925 «Изделия космической техники. Общие требования к космическим средствам по ограничению техногенного засорения околоземного космического пространства».

В 2019 г. продолжилась работа по совершенствованию нормативно-правовой основы осуществления космической деятельности России. В частности, Федеральным законом от 15 апреля 2019 г. № 54-ФЗ «О внесении изменений в отдельные законодательные акты Российской Федерации по вопросам лицензирования космической деятельности» внесены изменения в федеральные законы Российской Федерации от 20 августа 1993 г. № 5663-1 «О космической деятельности», от 26 декабря 2008 г. № 294-ФЗ «О защите прав юридических лиц и индивидуальных предпринимателей при осуществлении государственного контроля (надзора) и муниципального контроля», от 4 мая 2011 г. № 99-ФЗ «О лицензировании отдельных видов деятельности», от 13 июля 2015 г. № 215-ФЗ «О Государственной корпорации по космической деятельности

«Роскосмос», обеспечивающие гармонизацию указанных законодательных актов в части, касающейся лицензирования космической деятельности.

22 мая 2019 г. вступила в силу Конвенция Содружества Независимых Государств о сотрудничестве в области исследования и использования космического пространства в мирных целях.

4 апреля 2019 г. было подписано Соглашение между Правительством Российской Федерации и Правительством Республики Ангола о сотрудничестве в области исследования и использования космического пространства в мирных целях.

Российская Федерация принимала активное участие в работе основных международных форумов, касающихся деятельности по исследованию и использованию космического пространства, в мероприятиях Комитета ООН по исследованию и использованию космического пространства в мирных целях, его Научно-техническом и Юридическом подкомитетах, конференциях ООН по космосу, мероприятиях Управления ООН по вопросам космического пространства.

С 27 августа по 1 сентября 2019 г. в г. Москве был проведен Международный авиакосмический салон МАКС-2019.

Одним из наиболее важных направлений преобразований в ракетно-космической промышленности (РКП) в 2019 г. продолжает оставаться реализация мероприятий по развитию кадрового и образовательного потенциала Госкорпорации «Роскосмос» и предприятий РКП, в частности (по состоянию на 1 сентября 2019 г.):

- разработано более 60 профессиональных стандартов в области ракетной техники и космической деятельности (нарастающим итогом);
- сформированы наименования профессиональных квалификаций более чем 50% профессиональных стандартов;
- проведена профессионально-общественная аккредитация более 20 образовательных программ;
- создана и функционирует АНО «Корпоративная Академия Роскосмоса»
- ключевой образовательный центр ракетно-космической отрасли, объединяющий лучшие российские и мировые практики в области обучения и развития персонала (слушателями указанной Академии являются специалисты и руководители всех уровней Госкорпорации «Роскосмос» и предприятий отрасли, а также представители внешних заказчиков);
- Госкорпорация «Роскосмос» выступила в качестве партнера состоявшегося 22–27 августа 2019 г. 45-го Мирового чемпионата по профессиональному мастерству WorldSkills Kazan 2019, а также в качестве генерального партнера в компетенции «Инженерия космических систем» направления FutureSkills;
- в г. Королёве в период с 31 мая по 4 июня 2019 г. проведен IV корпоративный Чемпионат сквозных рабочих профессий Госкорпорации «Роскосмос» профессионального мастерства по стандартам WorldSkills «Молодые профессионалы Роскосмоса» (в мероприятиях чемпионата приняли участие более 400 сотрудников из 30 предприятий РКП и образовательных организаций);
- во всероссийском детском центре «Океан» проведена Девятая профильная смена Госкорпорации «Роскосмос» (участие приняли 180 школьников из 23 регионов России).

Реализация мероприятий по данному направлению позволит повысить эффективность и качество результатов решаемых отраслью задач и обеспечить ее устойчивое развитие и конкурентоспособность.

С полным текстом доклада вы можете ознакомиться на официальном сайте Управления Организации Объединённых Наций по вопросам космического пространства.