ITUEvents

Session 4

ITU in service of space

28 June 2023
Geneva, Switzerland

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Consideration of proposals for the development of rules and regulations for the use of radio frequency spectrum and satellite orbits that meet the requirements of the satellite industry

Session 4: Consideration of proposals for the development of rules and regulations for the use of radio frequency spectrum and satellite orbits that meet the requirements of the satellite industry

Moderator **Victor Strelets,**

Chairman SG4 ITU-R «Satellite services»

WP 4A

Jack Wengryniuk, Chairman ITU-R Working Party 4A

«Efficient orbit/spectrum utilization for the fixed-satellite service (FSS) and broadcasting-satellite service (BSS)»

WP 4B

David Weinreich, Chairman ITU-R Working Party 4B

«Systems, air interfaces, performance and availability objectives for the fixed-satellite service (FSS), broadcasting-satellite service (BSS) and mobile-satellite service (MSS), including IP-based applications and satellite news gathering (SNG)»

WP 4C

Nobuyuki Kawai, Chairman ITU-R Working Party 4C

«Efficient orbit/spectrum utilization for the mobile-satellite service (MSS) and the radiodetermination-satellite service (RDSS)»

Analysis and decomposition of the current situation

Currently there is already a visible trend where satellite technologies are significantly ahead of the development of regulations on the use of the radio-frequency spectrum and satellite orbits. Under these conditions, ITU faces challenges to find new approaches to improve international regulation on the use of the radio-frequency spectrum and satellite orbits.

The main reasons that underlie the discrepancy between the pace of development of legal norms and the accelerated development of satellite technologies:

- organizational
- procedural
- technical

Statistics of ITU Conferences in the field of radiocommunication

Periods	Conducted and planned conferences (WARC, WRC, RRC)	Number of conferences
1990 - 2000	1992 1993 1995 1997	4
2000 - 2010		5
2010 - 2020		3
2020 - 2030	2027	2

In the period 1980 - 1990, 17 (seventeen conferences) were held

Periodicity of revision of provisions RR

The frequency of updating the ITU Radio Regulations containing the rules and regulations for the use of the radio frequency spectrum and satellite orbits is approximately 4 years (the period between World Radiocommunication Conferences (WRCs)).

The next WRC will be held from November 20 to December 15, 2023 in Dubai (UAE). The agenda for WRC-23 was adopted in 2019.

Technology is advancing so rapidly that some operators have begun to introduce new satellite technologies using GSO and non-GSO satellites without waiting for the decision of the Conference to regulate such use. National administrations in some cases grant authorization for such use in the absence of internationally agreed rules.

Possible ways to remove this barrier to accelerate the revision of regulations:

1. **Reducing the time between Conferences and holding Conferences on specific urgent issues;**
2. **Simplifying the preparatory cycle and documentation in preparation for the WRC, considering the need to maintain the CPM in the current format…**

Regulatory barriers in the implementation of satellite projects

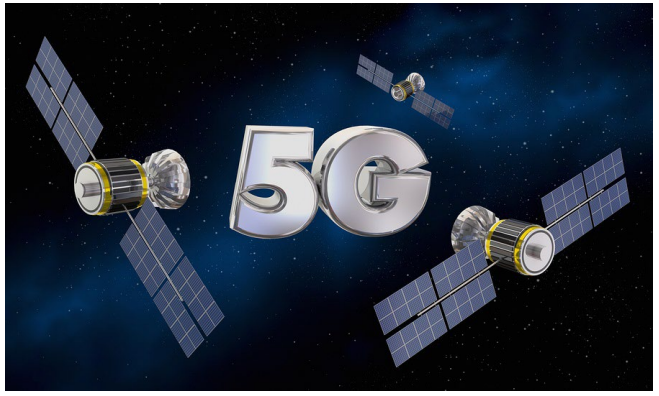
Some commercial plans from existing satellite direct-to-device (D2D) deployments may not be allowed under international rules. This use of spectrum likely breaks ITU regulations. It's also controversial among other satellite operators, who fear interference. Cross-border coordination may also present a risk. The issue needed to be tackled at a global level due to the cross-border nature of satellite services.

Existing satellite D2D operators are operating under provision No. 4.4 of Article 4 of the Radio Regulations, which allows spectrum usage on a non-interference basis.

Possible ways to remove this barrier in the implementation of satellite projects:

- Decision RA-23 or CPM27-1 to establish a Task Group 4C/5D to conduct urgent studies on compatibility and conditions for re-use of frequency bands allocated to the mobile service by non-GSO satellite systems.

Lack of requirements and standards for the infrastructure of the satellite component of the future 5G/6G ecosystem



Possible ways to remove this barrier in the implementation of satellite projects:

- Development of requirements and standards for radio interfaces of the satellite component of the 5G/6G ecosystem based on studies conducted within the framework of WP4B

Regulatory barriers in the implementation of satellite projects

The complexity of the procedures for coordination and notification with the ITU Radiocommunication Bureau of fillings for frequency assignments to satellite networks/systems forces operators to look for methods to avoid RR procedures and notify frequency assignments to satellite networks/systems in accordance with RR No. 4.4.

Possible ways to remove this barrier:

- Creation of a voluntary group of experts to develop proposals to simplify the procedures for coordination and notification of frequency assignments to satellite systems/networks, taking into account the different purposes and complexity of the systems/networks being notified.

Complicated procedures for discussing and adopting (by consensus) ITU-R Recommendations on the regulation of the use of the radiofrequency spectrum and satellite orbits by satellite networks/systems.

Possible ways to remove this barrier:

- Revision of ITU-R Resolution 1 to simplify and speed up the review and approval procedures for ITU-R documents, .

Actions taken to circumvent regulatory barriers

Notification of frequency assignments to NGSO satellite systems in accordance with No. 4.4 of the Radio Regulations (obligation not to cause interference or complain about interference)

Possible solutions:

- It is necessary to clarify the WRC that the use by administrations of the provision 4.4 of the Regulations is not the RIGHT of the administration, but an EXCEPTION FROM THE RULES, which is used on a temporary basis due to circumstances.

Notification of non-GSO multi-satellite systems is carried out by filing a large number of applications to the BR (system fragmentation) in order to meet the criteria for protecting GSO networks and stations of terrestrial services from the aggregate interference of non-GSO emissions (Articles 21 and 22 of the Radio Regulations).

Possible solutions:

- Development of a methodology for assessing total interference from satellite networks operating in overlapping frequency bands and development of the necessary software

Sustainability of radio spectrum and associated satellite orbit resources used by space services

Starlink:
- 4698 – started
- 4368 - in orbit
- 3694 - in operation.

Launch 19 brings the total OneWeb constellation to 634 satellites

By 2030, McKinsey expects to grow to 65,000 new communications satellites and 3,000 non-communication satellites (for applications such EESS). Companies are developing more than 100 new constellation

- Debris in outer space is a growing problem that could get worse as more satellites are launched.
- Risks of interference, unequal access to space and unsustainable use of low Earth orbits arise

Possible ways to manage the situation in space:
- NGSO megaconstellations should be designed to meet certain operational requirements that must eliminate obstructions to the use of spectrum and orbital resources by other satellite systems and interfere with their operation.

There is a need for stricter regulation of the use of low-orbit constellations precisely from the point of view of the danger of near-Earth space debris and the establishment of stricter rules in the ITU when submitting an filling for NGSO systems to the BR

Regulatory barriers in the implementation of satellite projects

- Complicated procedures for discussing and adopting (by consensus) ITU-R Recommendations on the regulation of the use of satellite networks/systems of the radio frequency spectrum;
- Complicated procedures for coordinating and notifying frequency assignments to satellite networks/systems in the BR;
- Difficulties encountered in the implementation of national planned allocations ((Appendices 30/30A and 30B);
- There are no coordination procedures for NGSO satellite systems operating in the same frequency band and overlapping service areas;
- Examination of applications for NGSO satellite systems is difficult due to the lack of ITU reference software for calculating interference both on the GSO network and on stations of terrestrial radio services (Recommendation S.1503);
- Unauthorized use on the national territory of terminals operating via satellites, including terminals in motion and operating via GSO/non-GSO satellites;
- There are no ITU recommendations containing national experience in licensing services of global NGSO systems;
- There are no studies and recommendations on regulating the use of satellite communications "satellite to cell", "satellite IoT" and others.

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Thank you for your attention!

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