

ITU World Radiocommunication Conference 2027 (WRC-27)

Agenda Items Overview

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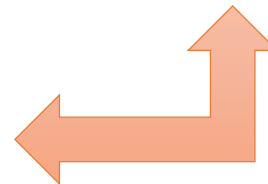
This presentation covers only the WRC-27 agenda items addressing space services.

Radio Regulations

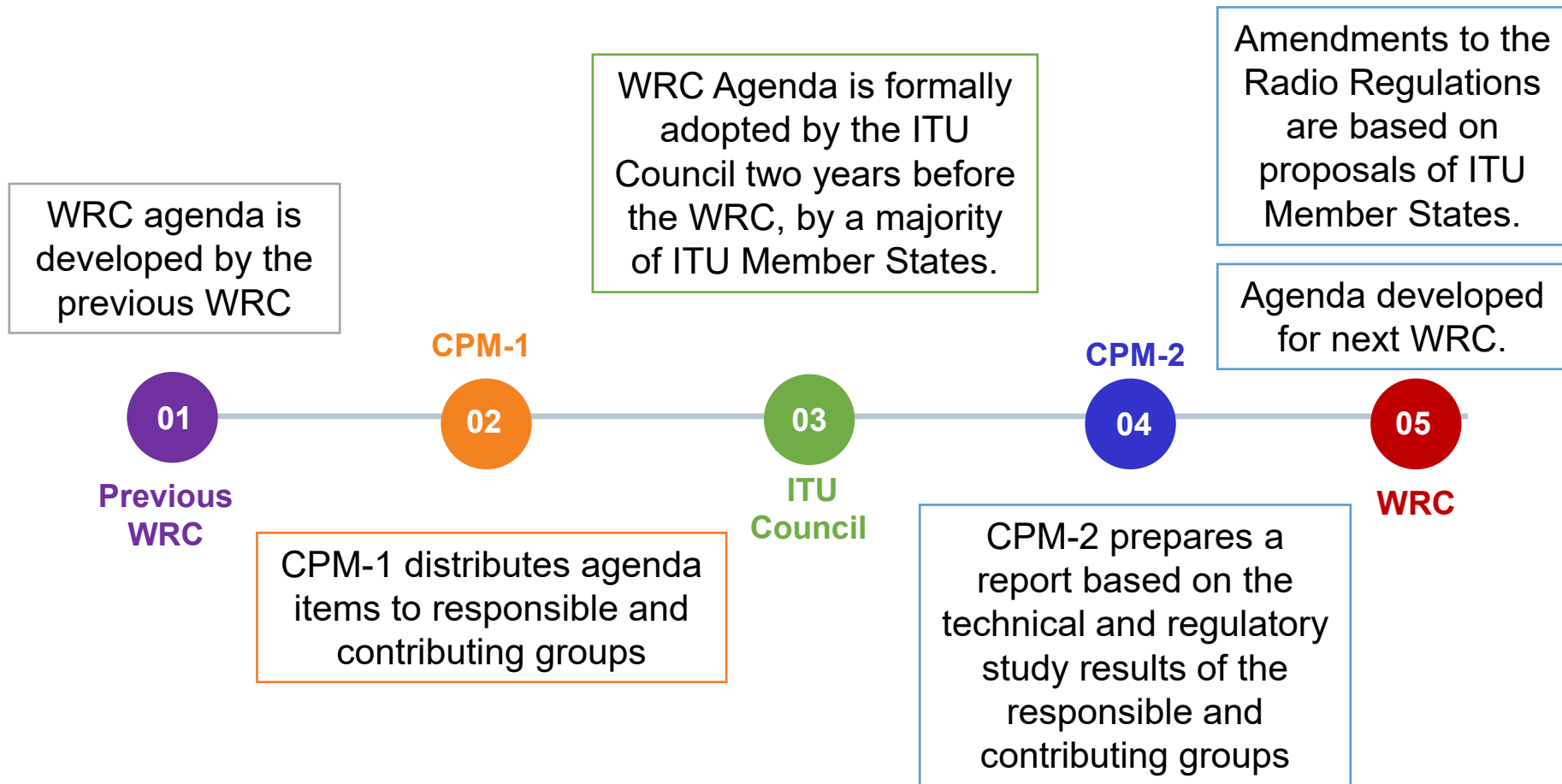
- ❖ **Intergovernmental Treaty** governing the use of radio frequency spectrum and satellite orbit resources
- ❖ Defines the rights and obligations of Member States in respect of the use of these resources
- ❖ Procedures for recording of a frequency assignment in the Master Register (MIFR) for international recognition and protection

World Radiocommunication Conference (WRC)

- ❖ Held every 3-4 years
- ❖ Brings together all stakeholders in a process aimed at developing and making decisions by consensus
- ❖ **Revises and updates** the Radio Regulations



WRC Cycle



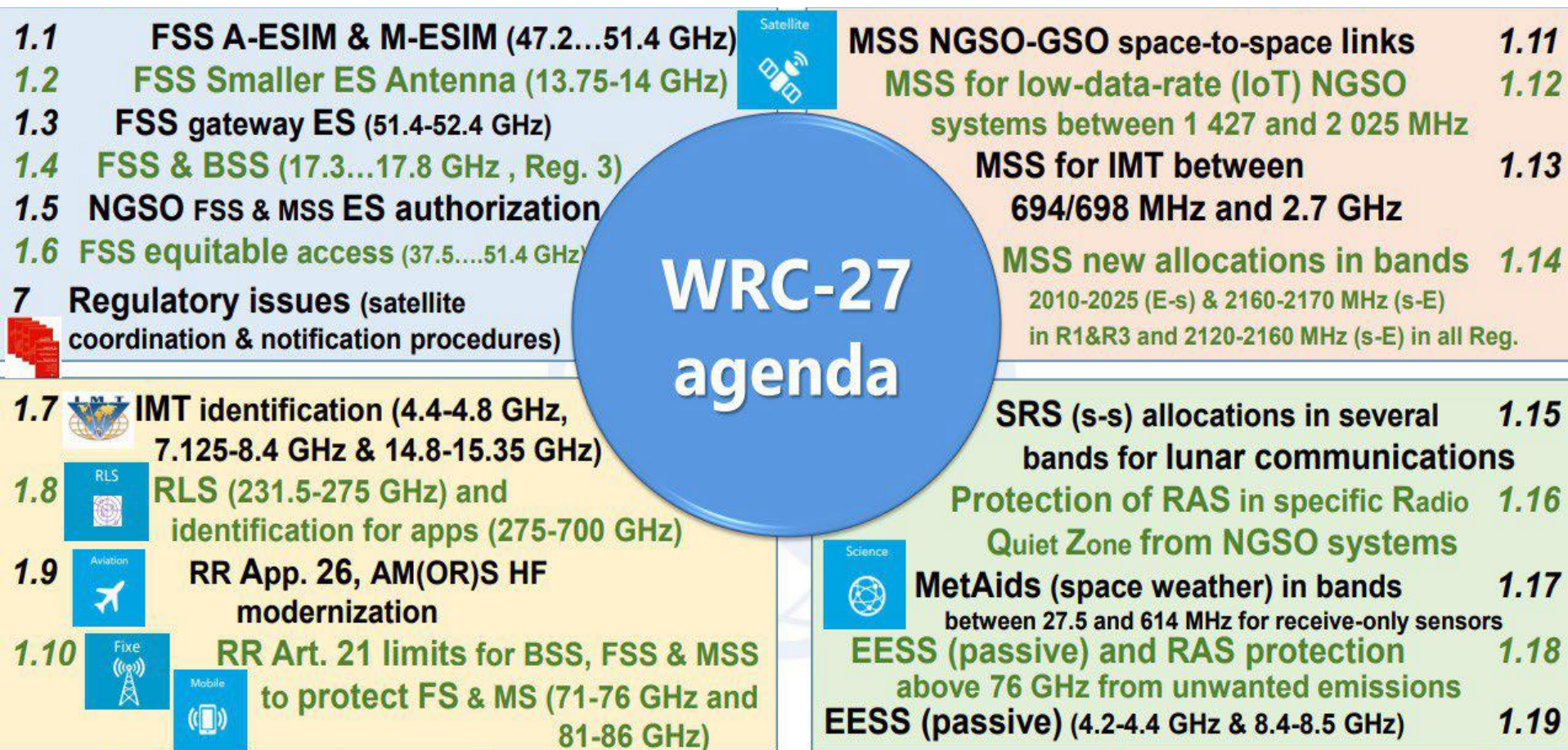
CPM: Conference Preparatory Meeting

(Responsible and contributing) groups: refer to ITU-R Study Groups/Working Parties

Any ambiguity, error, or difficulty ?

- ❖ The Radio Regulations are the result of lengthy negotiations, concluded through compromises among interested parties. As a result, the text of legal provisions may be obscure or ambiguous, and errors may occur.
 - ❖ The Radio Regulations Board (**RRB**) adopts **Rules of Procedure** to address such cases.
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- ❖ Difficulties encountered in implementation of the Radio Regulations could be reported to WRC through the Director's report.
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- ❖ Member States can bring issues (not included in the WRC agenda items) to the Conference for a decision, but issues related to changes/amendments to the Radio Regulations shall be strictly avoided.

List of WRC-27 Agenda items *



* WRC's standing agenda items and sub-items are not included in the above picture.

Categories of WRC Agenda Items

Category I: Additional spectrum

Possible new frequency band allocation to a specific service, while ensuring protection and sharing with incumbent active services and passive services in nearby and adjacent frequency bands.

Category II: Extension of the use of an allocated frequency band

The allocation to the service in the frequency band already exists; the introduction of new applications, revisions to the conditions of use, or changes in the manner of use are under consideration, necessitating updates to the applicable technical, regulatory and operational provisions.

Category III: Regulatory issues

Introducing new or updating existing regulatory and operational provisions governing access to spectrum and orbit resources to address implementation challenges, taking into account advances in technology and the emergence of new radio applications and systems operating in the same or adjacent/nearby frequency bands.

Category I : Additional spectrum

Agenda Item	Frequency bands under consideration	Service	Remarks
1.4	17.3-17.7 GHz	FSS (space-to-Earth) in R3	GSO, non-GSO
	17.3-17.8 GHz	BSS (space-to-Earth) in R3	
1.12	1427-1432 MHz	MSS (space-to-Earth)	low-data-rate non-GSO MSS systems, IoT
	1645.5-1646.5 MHz	MSS (space-to-Earth) (Earth-to-space)	
	1880-1920 MHz	MSS (space-to-Earth) (Earth-to-space)	
	2010-2025 MHz	MSS (space-to-Earth) (Earth-to-space)	
1.13	694/698 MHz to 2.7 GHz (give priority to bands allocated to MS, identified for IMT)	MSS	direct connection between space stations and IMT user equipment
1.14	2010-2025 MHz	MSS (Earth-to-space) in R1&R3	Bands overlapped with IMT
	2160-2170 MHz	MSS (space-to-Earth) in R1&R3	
	2120-2160 MHz	MSS (space-to-Earth) in all Regions	
1.19	4200-4400 MHz	EESS (passive)	Measurements of Sea Surface Temperature (SST)
	8400-8500 MHz		

Category II: Extension of the use of an allocated frequency band

Agenda Item	Frequency bands under consideration	Existing Allocation	Changes
1.1	47.2-50.2 GHz (Earth-to-space) 50.4-51.4 GHz (Earth-to-space)	FSS	Allow A-ESIMs & M-ESIMs communicating with GSO & non-GSO satellite networks/systems
1.2	13.75-14 GHz (Earth-to-space)	FSS	Use earth stations with smaller antenna sizes
1.3	51.4-52.4 GHz (Earth-to-space)	FSS	Enable gateway earth stations transmitting to non-GSO satellites
1.11	1518-1544 MHz 1545-1559 MHz 1610-1645.5 MHz 1646.5-1660 MHz 1670-1675 MHz 2483.5-2500 MHz	MSS	Add space-to-space transmissions (non-GSO space stations with non-GSO systems or GSO networks).

Category III: Regulatory issues (1)

Agenda Item	Issues to resolve
1.5	Unauthorized operations of non-GSO orbit earth stations
1.6	Equitable access in 37.5-42.5 GHz (space-to-Earth), 42.5-43.5 GHz (Earth-to-space), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) frequency bands (Q/V bands)
1.10	Develop regulatory measures, including pfd and e.i.r.p. limits , for the FSS, MSS and BSS in 71–76 GHz and 81–86 GHz frequency bands, to protect terrestrial FS and MS (no provisions in the current Radio Regulations)
1.16	Protect radio astronomy (RAS) and specific Radio Quiet Zones from aggregate interference caused by non-GSO systems
1.18	Protect EESS passive and RAS in certain bands above 76 GHz from unwanted emissions of active services

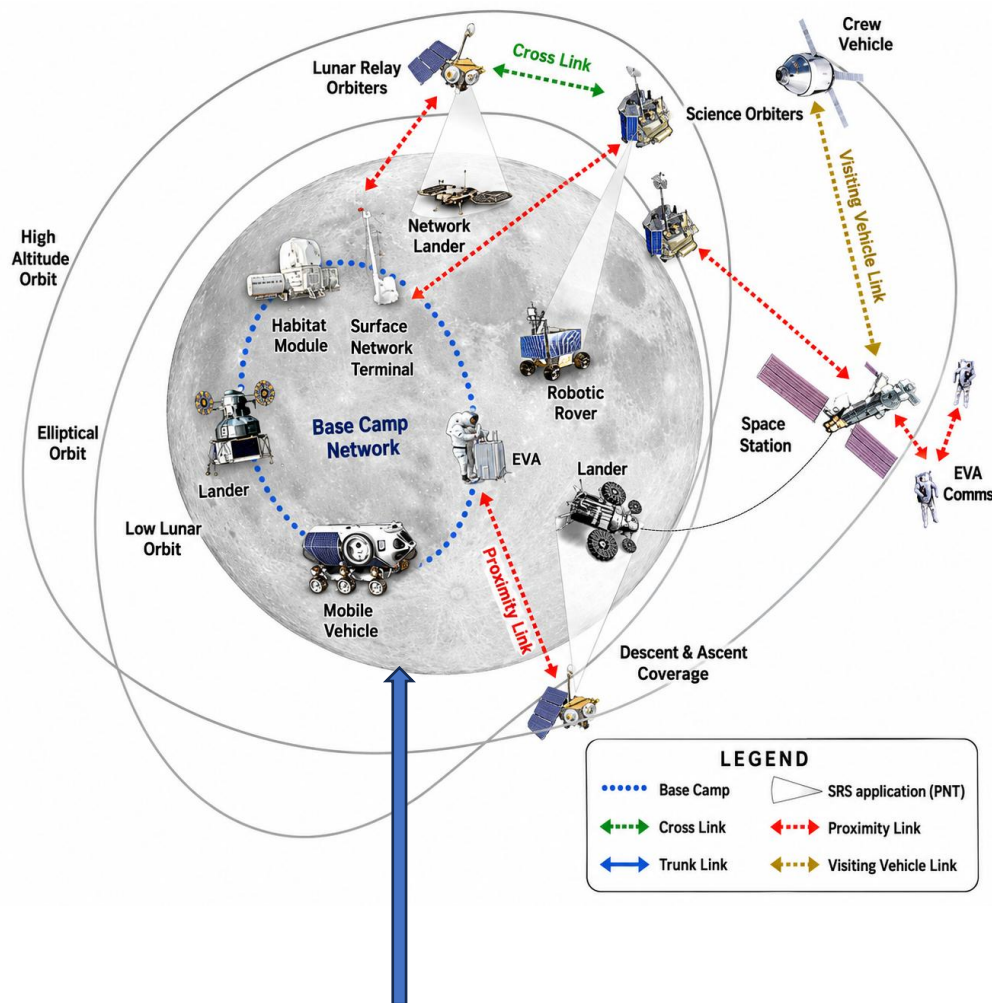
No change to the existing allocations or status of allocations

Category III: Regulatory issues (2)

Agenda Items 7

Topic A	Proposed modifications to Appendix 4 (new/modified data elements for satellite filings)
Topic B	Review the use of orbital separation (" coordination arc ") in determining when coordination is required between satellite networks
Topic C	Review and update Resolution 170 in light of operational experience and evolving satellite deployments (Appendix 30B related topic)
Topic D	Review Resolution 553 concerning regulatory procedures associated with satellite networks (BSS in 21.4-22 GHz band)
Topic E	Potential regulatory improvements related to application of RR No. 4.4 to stations of space services.

Agenda Item 1.15: Radio spectrum on the Moon and lunar orbit



The Moon ! Not the Earth !

Target:

Enable scientific lunar exploration, both robotic and human missions on and around the Moon in **SRS**.

Possible bands for modified or new SRS allocations

390-406.1 MHz, 420-430 MHz, 440-450 MHz (outside SZM);

2400-2690 MHz, 3500-3800 MHz, 5150-5570 MHz, 5570-5725 MHz, 5775-5925 MHz, 7190-7235 MHz, 8450-8500 MHz and 25.25-28.35 GHz

Study Scope

frequency-related matters for communications on the lunar surface and lunar orbit to surface links, including **SRS spectrum needs**, technical/protection criteria and lunar propagation.

Responsible groups for WRC-27 Agenda Items

Agenda Item	Responsible Group(s)	Agenda Item	Responsible Group(s)
1.1	WP 4A	1.11	WP 4C
1.2	WP 4A	1.12	WP 4C
1.3	WP 4A	1.13	WP 4C
1.4	WP 4A	1.14	WP 4C
1.5	WP 4A	1.15	WP 7B
1.6	WP 4A	1.16	WP 7D
1.7	WP 5D	1.17	WP 7C
1.8	WP 5B	1.18	WP 7C/WP 7D
1.9	WP 5B	1.19	WP 7C
1.10	WP 5C	7	WP 4A

WP: ITU-R Working Party

Some observations (1)

- ❖ Some **frequency bands** are being considered **under multiple agenda items** (e.g., Agenda Items 1.12, 1.13, and 1.14). Therefore, the regulatory provisions and associated conditions proposed under these agenda items should be harmonised to ensure a consistent and coherent regulatory framework.
- ❖ Agenda items concerning **terrestrial services** (e.g., IMT in MS) and **space services** (e.g., MSS) may target the allocation **in same frequency bands**. In such cases, the coexistence of independently operated satellite and terrestrial systems with co-frequency operation and overlapping coverage may present sharing and compatibility challenges.
- ❖ Even when they do not fall within the same frequency bands, some agenda items are related because the frequency bands under study are **adjacent or close to each other**. For example, Agenda Item 1.19 (concerning new allocation to passive services) is related to Agenda Item 1.7 (concerning identification of frequency bands to IMT systems).

Some observations (2)

- ❖ Some agenda items may be interrelated due to similarities in their regulatory nature. For example, the discussion under **Agenda Item 1.6** (equitable access to Q/V bands) draws on some of the ideas reflected in Resolutions **170** (Rev.WRC-23) and **553** (Rev.WRC-23), whose modifications are being considered under **Agenda Item 7** (Topics C and D).
- ❖ Attention should also be given to the assumptions underlying discussions under different agenda items. For example, discussions on Q/V-band use and aggregate EPFD limits for non-GSO systems often assume a limited number of constellations and that available “limit” shares can be coordinated and allocated through consultation among a small number of operators. Conversely, equitable-access discussions raise concerns that the Q/V band could become highly congested, making coordination difficult and potentially restricting access for future entrants.

Some observations (3)

- ❖ Recent WRC agenda items increasingly focus on two trends:
 - **Greater mobility of satellite systems:** mobile terminals operating in traditional FSS, and even BSS frequency bands, and growing spectrum demand for MSS.
 - **Rapid growth of non-GSO systems:** expanding usage beyond traditional communications to broadband, security and defence, maritime and aeronautical communications, navigation, Earth observation, meteorological services and others.

These trends explain the increasing number of WRC agenda items addressing MSS and non-GSO satellite systems.

- ❖ The increasing use of **No. 4.4** (operation in derogation of the Radio Regulations) highlights the risks when the Radio Regulations fail to keep pace with technological advances and new applications. This undermines the objectives of efficient spectrum and orbit use, and the prevention of harmful interference. Effective regulatory solutions to address the WRC agenda items are therefore essential.

WRC-27 information on ITU Website

❖ ITU WRC-27 Web Page

<https://www.itu.int/wrc-27/>

❖ ITU-R Preparatory Studies for WRC-27

<https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-27-studies.aspx>

❖ ITU-R Study Groups

<https://www.itu.int/en/ITU-R/study-groups/Pages/default.aspx>

The ITU logo is a light blue circular emblem featuring a globe with latitude and longitude lines. Overlaid on the globe are three stylized, curved lines representing radio waves or signal paths.

Thank you

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Acronyms

MS	mobile service	ESIM	earth stations in motion
FSS	fixed-satellite service	A-ESIMs	earth stations in motion on aircrafts
BSS	broadcasting-satellite service	M-ESIMs	earth stations in motion on vessels
MSS	mobile-satellite service	IMT	international mobile telecommunications
EESS	Earth exploration-satellite service	IoT	Internet of Things
SRS	space research service	R1,R2,R3	ITU Region 1, Region 2 and Region 3
MetAids	meteorological aids service	pfd	power flux-density
RAS	radio astronomy service	e.i.r.p.	equivalent isotropically radiated power
SZM	shielded zone of the Moon		