

ITU Regulatory Procedures for Small Satellites



KiboCUBE (UNOOSA)

Xiuqi Wang

**Head of Data Treatment Section
ITU-Radiocommunication Bureau**

11 September 2023

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**Brief Intro to ITU, Legal Framework, Frequency Allocation,
Spectrum Regulations, Regulatory Procedures,
SSHB, BR software, BRIFIC, Online services ...**

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An aerial photograph of the International Telecommunication Union (ITU) building in Geneva, Switzerland. The building is a large, modern structure with a grid-like facade of windows. In the foreground, there is a multi-lane road with several cars and a bus. The area is surrounded by green trees and a clear sky. The text "Brief Introduction of ITU" is overlaid in the center of the image.

Brief Introduction of ITU

**ITU is a specialized agency
of the United Nations
for information and
communication technologies
(ICTs)**



History of International Telecommunication Union (ITU)

155 years old: founded as the International Telegraph Union on 17 May 1865 by 20 nations

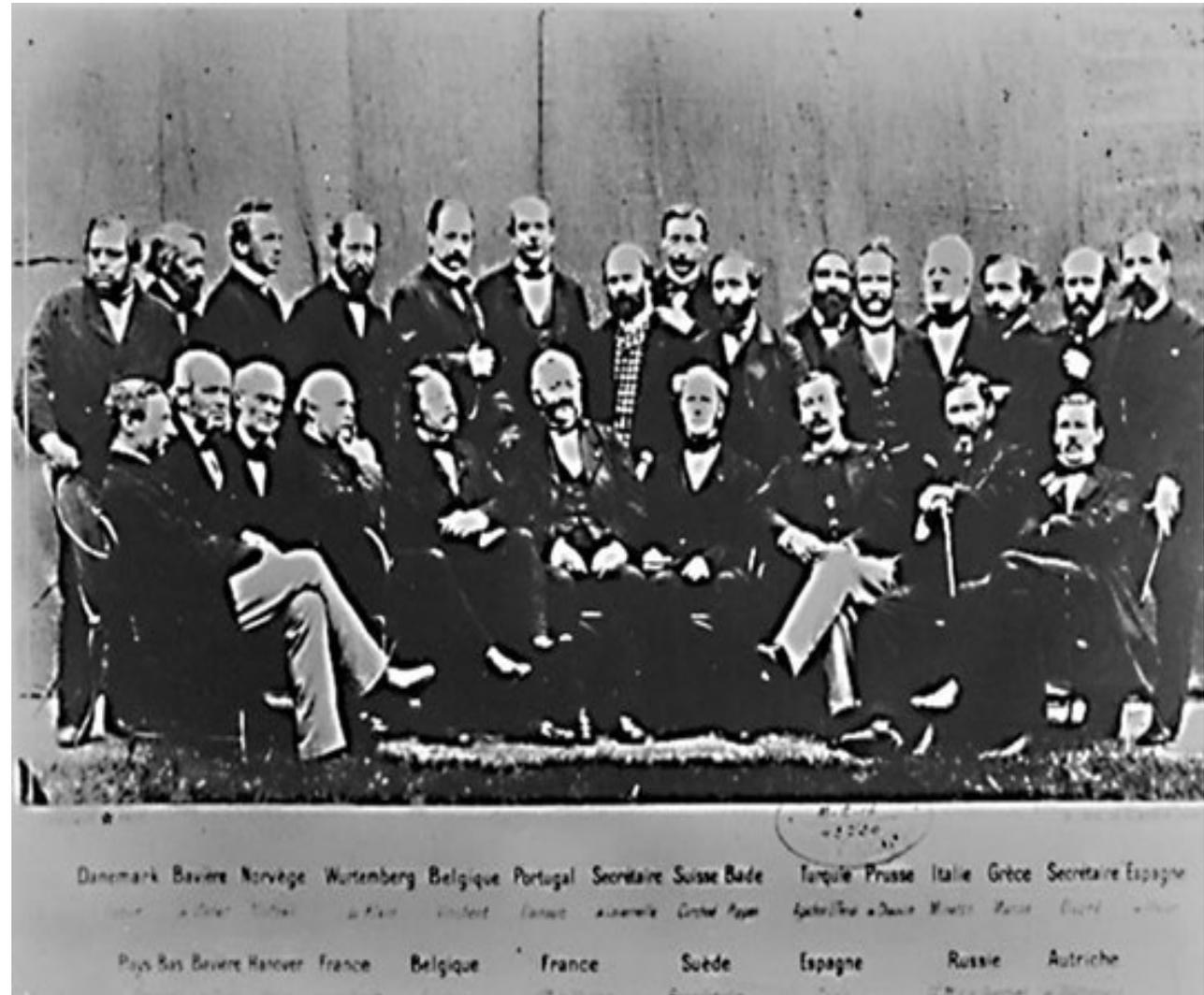
- Common rules to standardize equipment to facilitate international interconnection,
- Adopted uniform operating instructions which would apply to all countries,
- Common international tariff and accounting rules.

Merged with the International Radiotelegraph Union in 1932

New ITU name came into effect on 1 Jan 1934

International Radiotelegraph Convention (1st Radio Regulations) established in 1906

Became UN agency in 1947





ITU membership

193

MEMBER
STATES



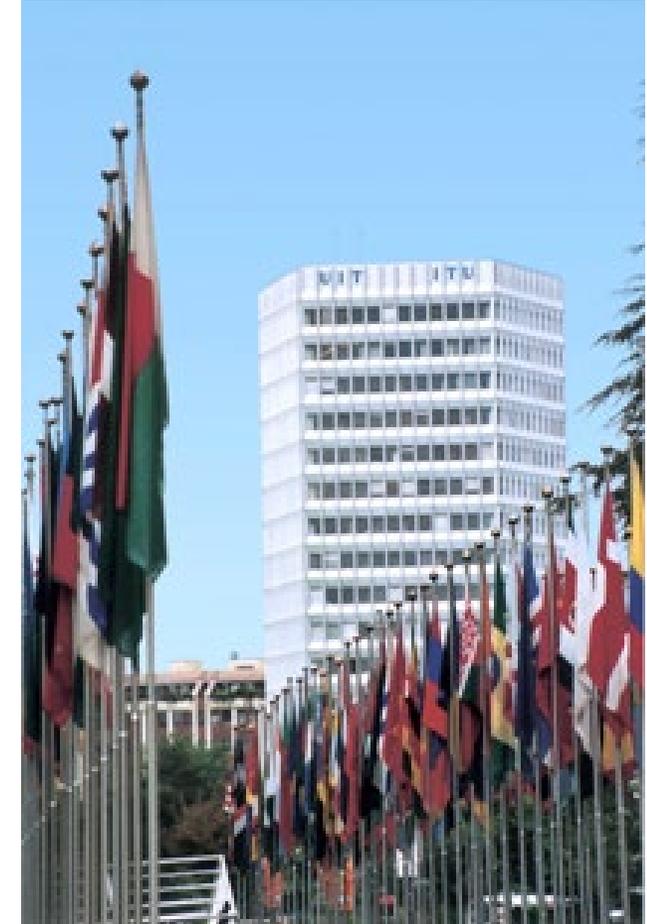
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INDUSTRY &
INTERNATIONAL
ORGANIZATIONS

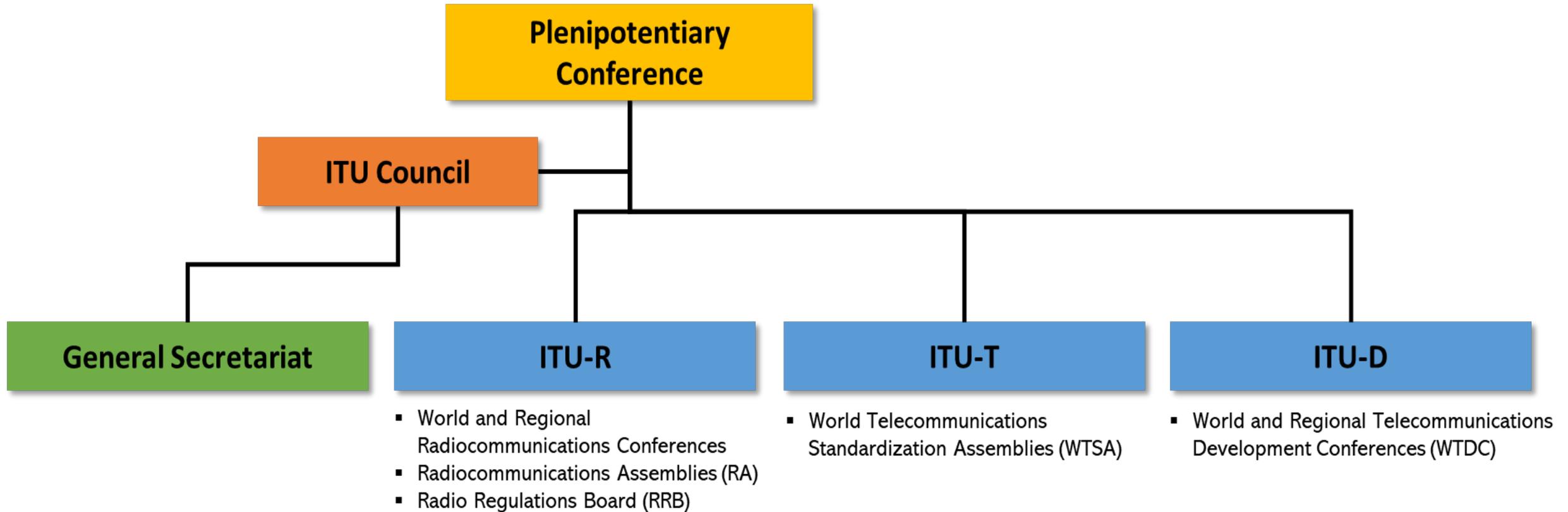


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ACADEMIA
MEMBERS



ITU structure



Radiocommunication Sector (ITU-R)



- is to ensure **interference free** through the **implementation and the efficient and timely update of the:**

- Radio Regulations and
- Regional Agreements.

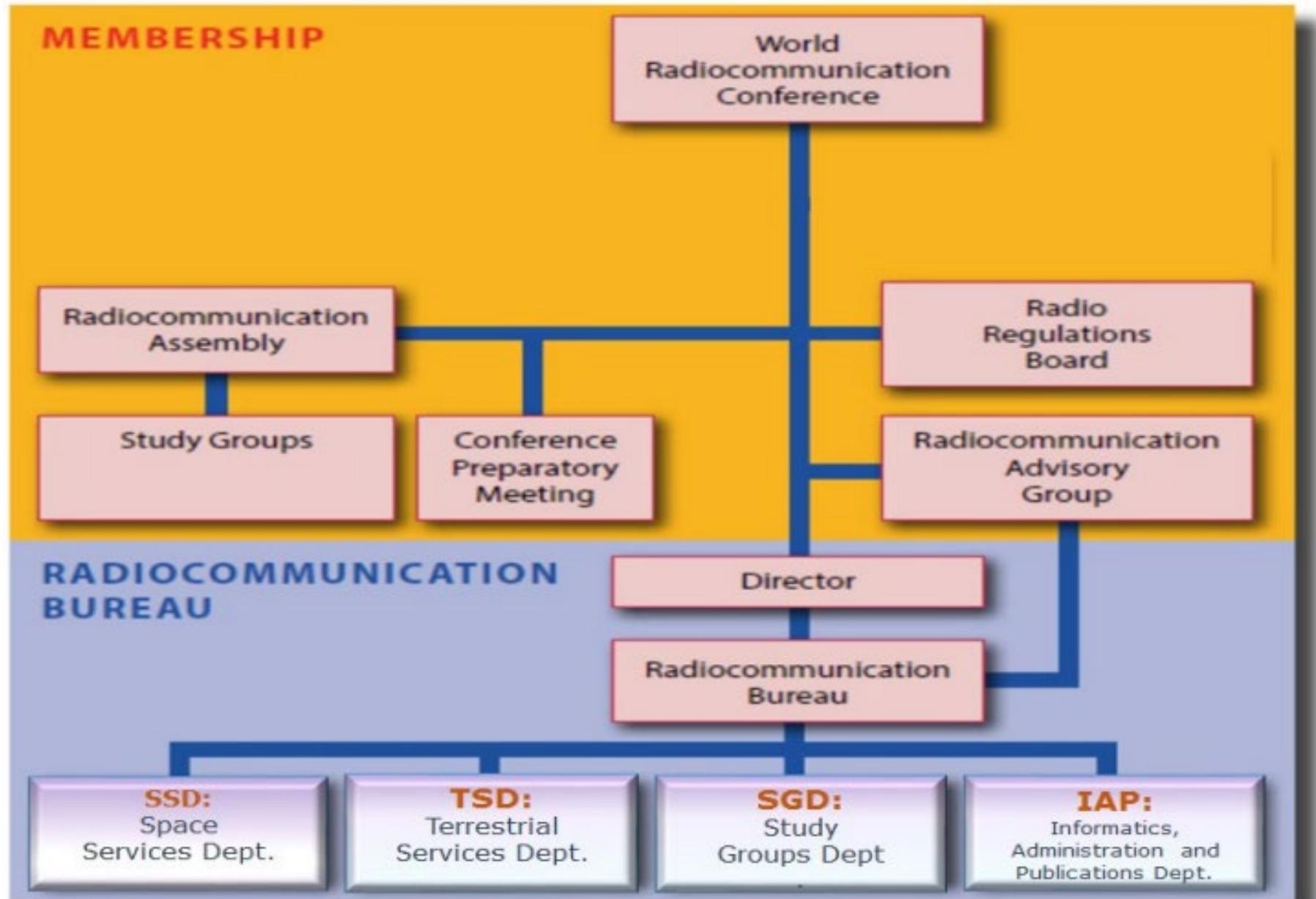
Objective

- Developing and updating international regulations on the use of spectrum and associated orbits
- Applying these regulations and managing the MIFR
- Developing and adopting standards and best practices on the use of orbit/spectrum resources
- Disseminating information on these regulations, standards and best practices

Role/Duties

Radio standardization also establishes '*Recommendations*' intended to assure the necessary performance and quality in operating radiocommunication systems, and seeks ways and means to conserve spectrum and ensure flexibility for future expansion and new technological developments.

ITU-R and BR Structure



World Radiocommunication Conferences

ITU
RADIO-
COMMUNICATION
SECTOR

update the **Radio Regulations**, the international treaty governing the use of the radio-frequency spectrum and satellite orbits

and

ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services

Mobile



Satellite



Maritime



Emergency



Aviation



Broadcasting



Science



World Radiocommunication Conferences (WRC)

- Considering the evolving spectrum requirements of all Radiocommunication services, the advances in technology, and the need for protection of existing services.

WRC reviews the requirements



- Modify the RR and consider any radiocommunication matter of worldwide character
- Develop instructions to the RRB and the BR
- Determine issues considered by RA and SGs as part of the preparatory work for WRC future
- Set agenda of next WRC, and subsequent draft.

WRC has the authority, among others, to



- Develop and maintain, by consensus, a sustainable ecosystem for radiocommunications and avoid disruptions.

On a consensus basis



Create regulatory certainty for a multi-trillion dollars activity which plays an increasingly important role in the development of our societies

Creating certainty requires consensus in order to achieve stable results on a sustainable use of orbit/spectrum resources

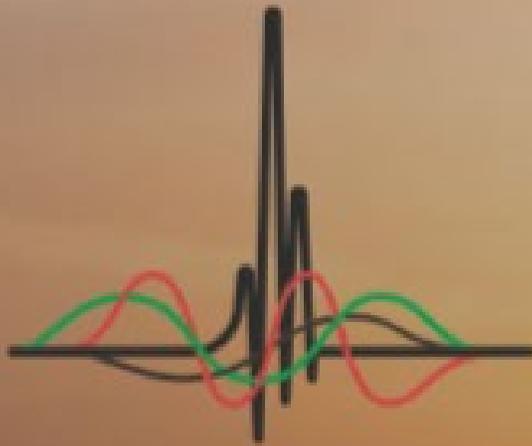


49th Conferences since 1906



ITU World Radiocommunication Conference 2019,
Sharm el-Sheikh, Egypt, 28 October to 22 November 2019

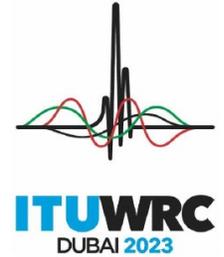
50th Conferences since 1906



ITUWRC
DUBAI2023

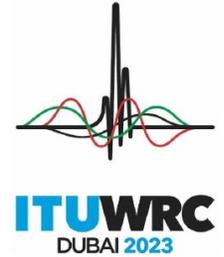
20 November - 15 December 2023
Dubai, United Arab Emirates

Some WRC-23 Agenda Items relevant to Space Services



Agenda Item No.	Description	Brief
1.15	to harmonize the use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service globally, in accordance with Resolution 172 (WRC-19);	ESIM for GSO in AP30B band
1.16	to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 17.7-18.6 GHz and 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) by non-GSO FSS earth stations in motion, while ensuring due protection of existing services in those frequency bands, in accordance with Resolution 173 (WRC-19);	ESIM for Non-GSO
1.17	to determine and carry out, on the basis of the ITU R studies in accordance with Resolution 773 (WRC-19), the appropriate regulatory actions for the provision of inter-satellite links in specific frequency bands, or portions thereof, by adding an inter-satellite service allocation where appropriate;	inter-satellite links
1.18	to consider studies relating to spectrum needs and potential new allocations to the mobile-satellite service for future development of narrowband mobile-satellite systems, in accordance with Resolution 248 (WRC-19);	New allocation for MSS
1.19	to consider a new primary allocation to the fixed-satellite service in the space-to-Earth direction in the frequency band 17.3-17.7 GHz in Region 2, while protecting existing primary services in the band, in accordance with Resolution 174 (WRC-19);	Upgrade of FSS allocation for Region 2

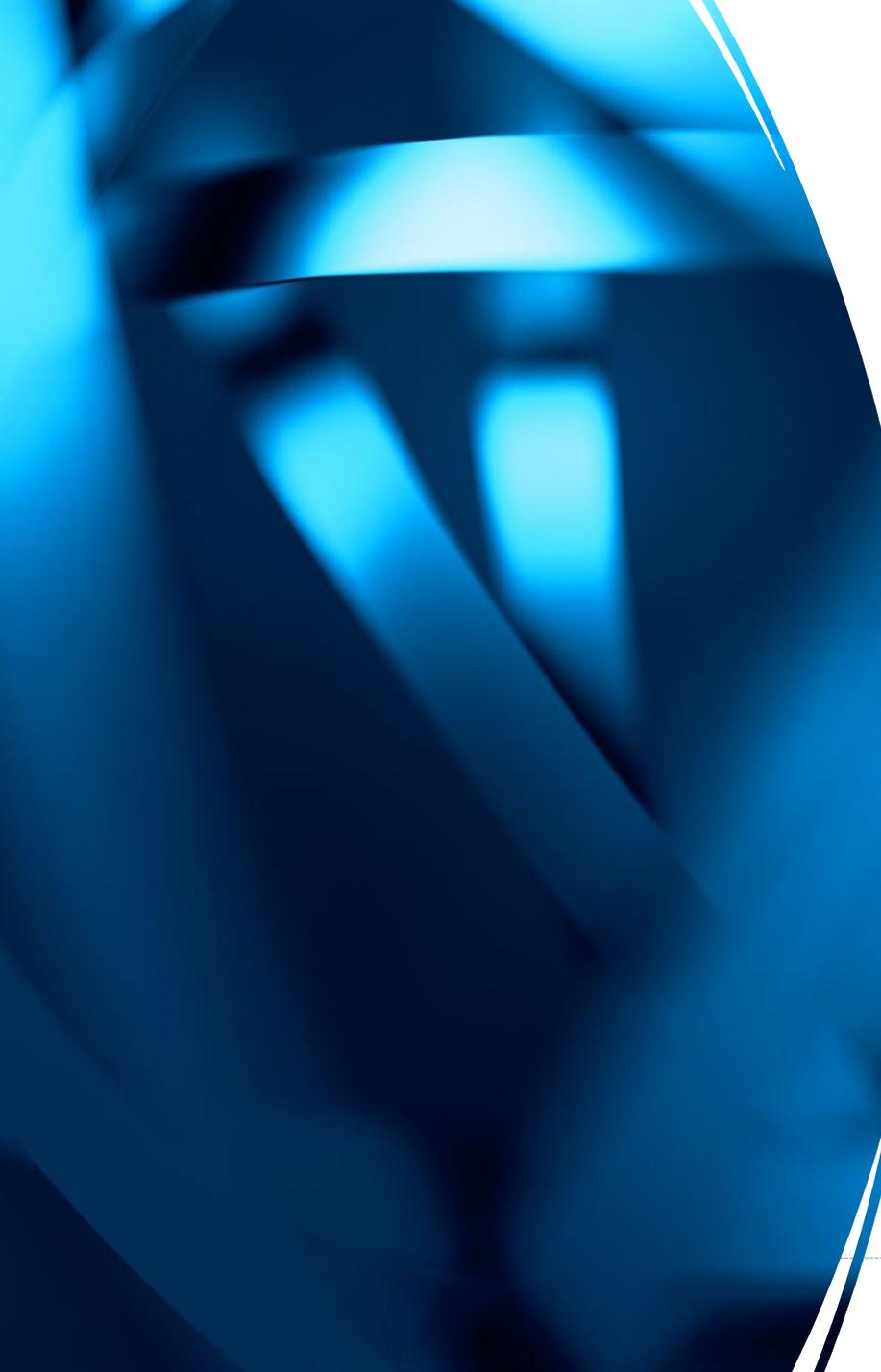
Some WRC-23 Agenda Items relevant to Space Services



Agenda Item No.		Description
7		to consider possible changes, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, on advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution 86 (Rev.WRC-07) , in order to facilitate the rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;
	A	Tolerances for certain orbital characteristics of non-GSO space stations in the FSS, BSS or MSS
	B	Non-GSO bringing into use post-milestone procedure
	C	Protection of geostationary satellite networks in the mobile-satellite service operating in the 7/8 GHz and 20/30 GHz bands from emissions of non-geostationary satellite systems operating in the same frequency bands and identical directions
	D	Issues for which consensus was achieved in ITU-R (See below)
	D1	Modifications to Appendix 1 to Annex 4 of RR Appendix 30B
	D2	New RR Appendix 4 parameters for Recommendation ITU-R S.1503 updates
	D3	BR reminders for BIU and BBIU
	E	RR Appendix 30B improved procedures for new Member States
	F	Excluding uplink service area in RR Appendix 30A for Regions 1 and 3 and RR Appendix 30B
	G	Revisions to Resolution 770 (WRC-19) to allow its implementation
	H	Enhanced protection of RR Appendices 30/30A in Regions 1 and 3 and RR Appendix 30B
	I	Special agreements under RR Appendix 30B
	J	Modifications to Resolution 76 (Rev.WRC-15)
	K	Modification to Resolution 553 (Rev.WRC-15) to remove certain restrictions that prevent administrations from taking effective advantage of the Resolution

An aerial photograph of a city street intersection. The street is wide with multiple lanes, marked with white and blue lines. There are several cars and a bus on the road. The buildings are modern, with large glass windows and facades. There are many trees with green and yellow leaves, suggesting an autumn setting. The sky is clear and blue.

Legal Framework and Background of Radio Regulations



Legal Framework (ITU Treaties)

The Constitution:

- **Basic instrument of the International Telecommunication Union** with the object of facilitating peaceful relations, international cooperation among peoples and economic and social development by means of efficient telecommunication services

The Convention:

- **Complements the Constitution**

The Administrative Regulations:

- **Radio Regulations (RR)**
- **International Telecommunication Regulations (ITRs)**

Both treaties complement the Constitution and the Convention

Legal framework – ITU Constitution

Article 1 – Purposes of the Union

- Effect **allocation of bands** of the radio-frequency spectrum, the allotment of radio frequencies and the **registration** of radio-frequency assignments and, for space services, of **any associated orbital position** in the geostationary-satellite orbit or of **any associated characteristics of satellites in other orbits**, in order to **avoid harmful interference** between radio stations of different countries
- coordinate efforts to **eliminate harmful interference** between radio stations of different countries and to improve the use made of the radio-frequency spectrum for radiocommunication services and of the geostationary-satellite and other satellite orbits
-

Article 44 – Use of the Radio-Frequency Spectrum and of the Geostationary-Satellite and other Satellite Orbits

- Orbit/spectrum resources are **limited natural resources**
- Must be used **rationally, efficiently and economically**
- Have **equitable access** to those orbits and frequencies
-

Article 45 – Harmful Interference

- **Not to cause harmful interference**
- Both Member States and operating agencies (see also Article 6)
-

Radio Regulations



- **Intergovernmental Treaty** governing the use of spectrum/orbit resources by administrations
- Define the **rights** and **obligations** of Member States in respect of the use of these resources
- **Recording of a frequency assignment** in the Master Register (**MIFR**) provides **international recognition and protection** – Art 8
- Updated every \approx **4 years** by a WRC
 - The most recent was held in Sharm El Sheikh, Egypt in 2019
 - Next WRC – Dubai, United Arab Emirates
 - 20 November to 15 December 2023



<http://www.itu.int/pub/R-REG-RR/>

Complemented by Rules of Procedure adopted by the Radio Regulations Board

Radio Regulations



Some relevant Articles

- Article **1** Definitions
- Article **5** Table of Frequency Allocations
- Article **9** and **11** Procedures for the advance publication (API), coordination (CR/C) and notification
- Article **21/22** Power limits
- Article **25** Amateur and Amateur-satellite service
- Article **29A** Radio services related to Earth observation

Some relevant Appendices

- Appendix **1** Classification of emissions
- Appendix **4** Data required for satellite filings
- Appendix **5** Data required for satellite filings
- Appendix **30** BSS plan
- Appendix **30A** BSS plan (feeder link)
- Appendix **30B** FSS plan

Radio Regulations - Resolutions



Concerning submissions

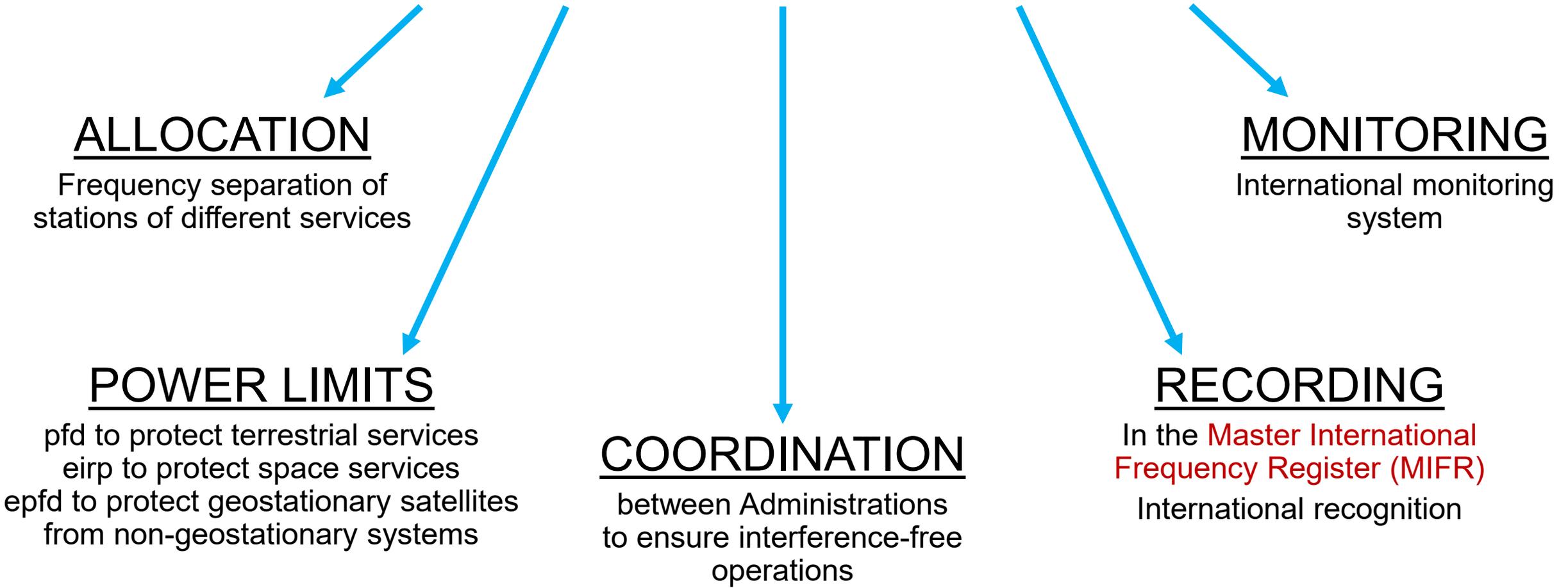
- Resolution **55** – submissions in Spacecap/Gims format and as-received
- Resolution **907** – online communications
- Resolution **908** – online submission

Others

- Resolution **4** – period of validity
- Resolution **32** – short duration mission
- Resolution **35** – milestone requirements for NGSO
- Resolution **49/552** – due diligence information
- Resolution **553** – special procedure for 21.4-22 GHz

Radio Regulations – Regulatory and technical solutions

5 Mechanisms to control interference and ensure equitable access



Article 43 special rules concerning aeronautical mobile-satellite service



- **43.1 § 1** Frequencies in any band allocated to the **aeronautical mobile (R) service** and the **aeronautical mobile-satellite (R) service** are reserved for communications relating to safety and regularity of flight between any aircraft and those aeronautical stations and aeronautical earth stations primarily concerned with flight along national or international civil air routes.
- **43.2 § 2** Frequencies in any band allocated to the **aeronautical mobile (OR) service** and the **aeronautical mobile-satellite (OR) service** are reserved for communications between any aircraft and aeronautical stations and aeronautical earth stations other than those primarily concerned with flight along national or international civil air routes.
- **43.4 § 4** Administrations shall not permit public correspondence in the frequency bands allocated exclusively to the **aeronautical mobile service** or to the **aeronautical mobile-satellite service**.

RR Article 21

Verification of PFD/EIRP limits for NGSO



GIBC SNS V9.1

PFD/EIRP Earth Station EPFD Power Control FOS Appendix 8
 Appendix 7 Appendix 30B Appendix 30 30A Tools / Options
 PFD/EIRP GSO PFD (space serv.) PFD/EIRP NGSO

PFD/EIRP limits applicable to NGSO system

Network: Start Cancel

Advanced orbit selection
 Use power Rec SF.675

Messages Filter
 Progress
 Warning
 Debug

Examination: Hard limits Antenna Maker

Message

Calculation Results

Version: 9.1.0.14 PFD/EIRP NGSO

TABLE 21-4 (Rev.WRC-19)

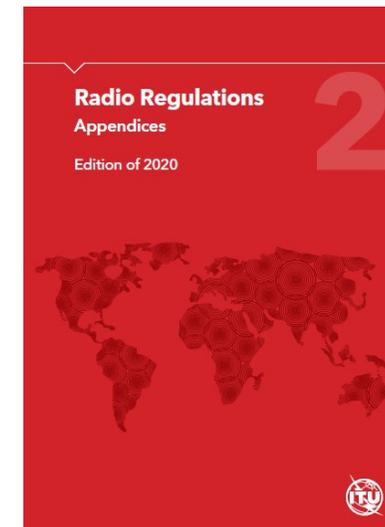
Frequency band	Service ^a	Limit in dB(W/m ²) for angles of arrival (δ) above the horizontal plane			Reference bandwidth			
		0°-5°	5°-25°	25°-90°				
1 670-1 700 MHz	Earth exploration-satellite Meteorological-satellite	-133 (value based on sharing with meteorological aids service)			1.5 MHz			
1 518-1 525 MHz (Applicable to the territory of the United States in Region 2 between the longitudes 71° W and 125° W)	Mobile-satellite (space-to-Earth)	0° ≤ δ ≤ 4°	4° < δ ≤ 20°	20° < δ ≤ 60°	4 kHz			
		-181.0	-193.0 + 20 log δ	-213.3 + 35.6 log δ		-150.0		
1 518-1 525 MHz (Applicable to all other territory of the United States in Region 2)	Mobile-satellite (space-to-Earth)	0° ≤ δ ≤ 43.4°	43.4° < δ ≤ 60°	60° < δ ≤ 90°	4 kHz			
		-155.0	-213.3 + 35.6 log δ	-150.0				
1 525-1 530 MHz ⁷ (Region 1, Region 3) 1 670-1 690 MHz ¹² 1 690-1 700 MHz (Nos. 5.381 and 5.382) 1 700-1 710 MHz 2 025-2 110 MHz 2 200-2 300 MHz	Meteorological-satellite (space-to-Earth) Space research (space-to-Earth) (space-to-space) Space operation (space-to-Earth) (space-to-space) Earth exploration-satellite (space-to-Earth) (space-to-space)	0°-5°	5°-25°	25°-90°	4 kHz			
		-154 ⁹	-154 + 0.5(δ - 5) ⁹	-144 ⁹				
		2 500-2 690 MHz 2 520-2 670 MHz 2 500-2 516.5 MHz (No. 5.404) 2 500-2 520 MHz 2 520-2 535 MHz (No. 5.403)	Fixed-satellite Broadcasting-satellite Radiodetermination-satellite Mobile-satellite Mobile-satellite (except aeronautical mobile-satellite)	-136 ¹⁰		-136 + 11/20(δ - 5) ¹⁰	-125 ¹⁰	1 MHz
		3 400-4 200 MHz	Fixed-satellite (space-to-Earth) (geostationary-satellite orbit)	-152		-152 + 0.5(δ - 5)	-142	
		3 400-4 200 MHz	Fixed-satellite (space-to-Earth) (non-geostationary-satellite orbit)	-138 - Y ^{22, 23}		-138 - Y + (12 + Y)(δ - 5)/20 ^{22, 23}	-126 ²³	1 MHz

Appendix 4 of the Radio Regulations



- Information required for register in MIFR

- For all satellite network filings, information required is specified in **RR Appendix 4**
- It covers parameters for satellite networks in non-planned bands:
 - Satellite name, responsible administration/operating agency
 - Orbital characteristics
 - Antenna beam characteristics
 - Service Areas
 - Frequency information
 - Power levels/designation of emissions
 - Associated earth or space stations
 - EIRP/PFD masks
 - Commitments
 -



- Symbols – Consult the Preface to the BRIFIC <https://www.itu.int/ITU-R/go/space-preface>

Appendix 4 of the Radio Regulations – Annex 2

Table of characteristics to be submitted for space and radio astronomy services
(Rev.WRC-12)

TABLE A
GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK OR SYSTEM,
EARTH STATION OR RADIO ASTRONOMY STATION (Rev.WRC-19)

Items in Appendix	A - GENERAL CHARACTERISTICS OF THE SATELLITE NETWORK OR SYSTEM, EARTH STATION OR RADIO ASTRONOMY STATION											Items in Appendix	Radio astronomy
		Advance publication of a geostationary-satellite network	Advance publication of a non-geostationary-satellite network or system subject to coordination under Section II of Article 9	Advance publication of a non-geostationary-satellite network or system not subject to coordination under Section II of Article 9	Notification or coordination of a space operation function under Article 2A of Appendix 30 or 30A	Notification or coordination of a non-geostationary-satellite network or system	Notification or coordination of an earth station (including notification under Appendices 30A or 30B)	Notice for a satellite network in the broadcasting-satellite service under Appendix 30 (Articles 4 and 5)	Notice for a satellite network (feeder-link) under Appendix 30A (Articles 4 and 5)	Notice for a satellite network in the fixed-satellite service under Appendix 30B (Articles 6 and 8)			
A.1	IDENTITY OF THE SATELLITE NETWORK OR SYSTEM, EARTH STATION OR RADIOASTRONOMY STATION											A.1	
A.1.a	the identity of the satellite network or system	X	X	X	X	X		X	X	X	A.1.a		
A.1.b	the beam identification In the case of Appendix 30 or 30A, required only for modification, suppression or notification of Plan assignments In the case of Appendix 30B, required only for a network derived from the Allotment Plan								+	+	+	A.1.b	
A.1.e	Identity of the earth station or radio astronomy station:											A.1.e	
A.1.e.1	the type of earth station (specific or typical)							X				A.1.e.1	
A.1.e.2	the name of the station							X				A.1.e.2	X
A.1.e.3	For a specific earth station or radio astronomy station:											A.1.e.3	
A.1.e.3.a	the country or geographical area in which the station is located, using the symbols from the Preface							X				A.1.e.3.a	X
A.1.e.3.b	the geographical coordinates of each transmitting or receiving antenna site constituting the station (latitude and longitude in degrees and minutes) For a specific earth station, seconds are to be provided if the coordination area of the earth station overlaps the territory of another administration							X				A.1.e.3.b	X
A.1.f	Administration and intergovernmental organization symbol:											A.1.f	
A.1.f.1	the symbol of the notifying administration (see the Preface)	X	X	X	X	X	X	X	X	X	X	A.1.f.1	X
A.1.f.2	if the notice is submitted by the notifying administration in association with other administrations, the symbols of each of the administrations (see the Preface)	+	+	+	+	+	+	+	+	+	+	A.1.f.2	
A.1.f.3	if the notice is submitted on behalf of an intergovernmental satellite organization, the symbol of that organization (see the Preface)	+	+	+	+	+	+	+	+	+	+	A.1.f.3	
A.1.g	indicator showing that the non-GSO satellite system is planned to be operated in accordance with Resolution 32 (WRC-19) Required for advance publication and notification			X			+					A.1.g	
A.1.g.1	Not used											A.1.g.1	
A.1.g.2	Not used											A.1.g.2	

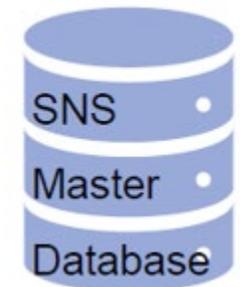
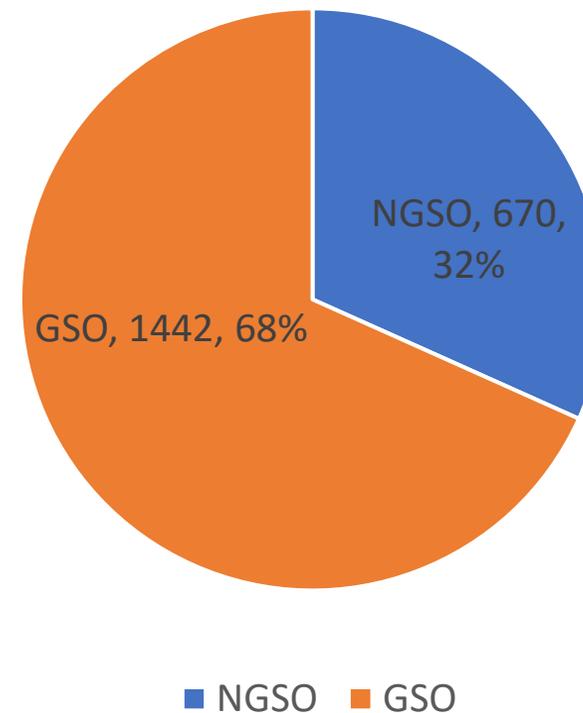
- X - Mandatory information
- + - Mandatory under the conditions specified in Column 2
- O - Optional information
- C - Mandatory if used as a basis to effect coordination with another administration



MIFR - Right to International Recognition

- *The international rights and obligations of administrations in respect of their own and other administrations' frequency assignments shall be derived from the recording of those assignments in the Master International Frequency Register (the Master Register) (RR No. 8.1)*
- *... other administrations shall take it into account when making their own assignments, in order to avoid harmful interference. ... (RR No. 8.3)*

Number of satellite networks recorded in the MIFR (as at 11.8.2023)



SNS online <https://www.itu.int/sns>
SRS_[BRIFIC number].mdb

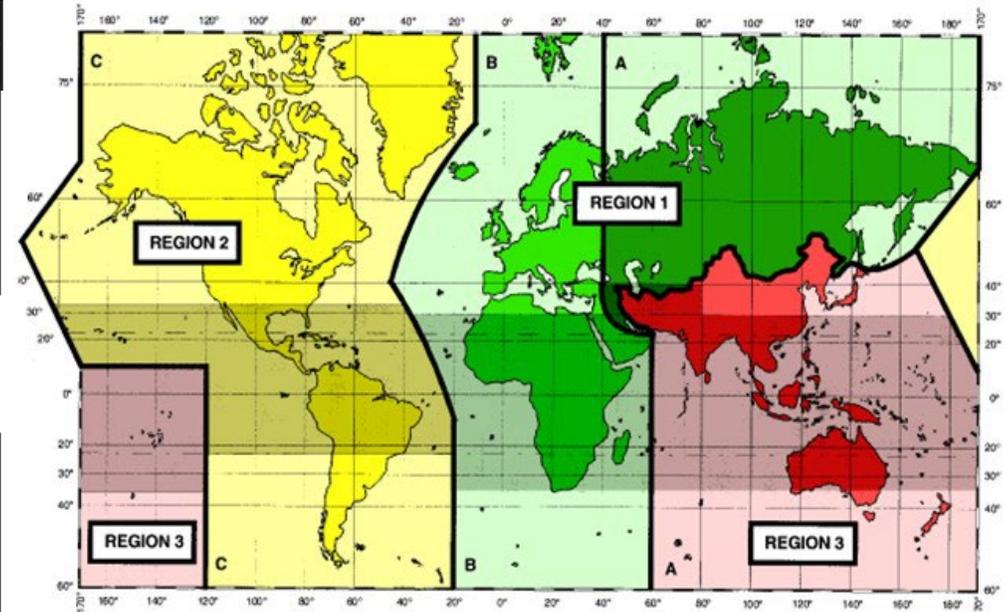
An aerial photograph of a city street intersection. The scene is dominated by modern architecture, including a large building with a grid-like facade and a taller, more traditional building in the background. The street is wide with multiple lanes, and there are several cars and a bus visible. The foreground is filled with lush green trees, and the overall atmosphere is bright and clear.

Table of Frequency Allocations

RR Article 5

Table of Frequency Allocations – RR Article 5

Allocation to services		
Region 1	Region 2	Region 3
2 025-2 110	SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392	
2 110-2 120	FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388	
2 120-2 160 FIXED MOBILE 5.388A 5.388B 5.388	2 120-2 160 FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth) 5.388	2 120-2 160 FIXED MOBILE 5.388A 5.388B 5.388
2 160-2 170 FIXED MOBILE 5.388A 5.388B 5.388	2 160-2 170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389E	2 160-2 170 FIXED MOBILE 5.388A 5.388B 5.388



It is very important also to read all footnotes shown with the allocation!

Allocations = Frequencies + Services + Regions

Space Radiocommunication Services

- Various Radiocommunication Services are defined in RR Article 1
 - Unless otherwise stated (i.e. with the word “space” or “satellite”), it is a terrestrial service

Examples:

- **1.57 amateur-satellite service:**

A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur service.

- **1.56 amateur service:** *A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.*

- **1.23 space operation service:**

A radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry and space telecommand. These functions will normally be provided within the service in which the space station is operating.

Notices for the amateur-satellite service is exempt from cost recovery fees. Administration should ensure that the use of this service complies with the definition shown above.

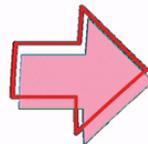
Other examples

of Relevant Radiocommunication Services - Definitions in Article 1

Earth exploration-satellite service

- **1.51** *Earth exploration-satellite service*: A radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which:
 - information relating to the characteristics of the Earth and its natural phenomena,
 - including data relating to the state of the environment, is obtained from *active sensors* or *passive sensors* on Earth satellites;
 - similar information is collected from airborne or Earth-based platforms;
 - such information may be distributed to *earth stations* within the system concerned;
 - platform interrogation may be included.This service may also include *feeder links* necessary for its operation.

Class of stations are described in the Preface



Meteorological-satellite Service

- **1.52** *meteorological-satellite service*: An earth exploration-satellite service for meteorological purposes.

TABLE 3

Class of Station

Symbol	Space Station Class of Station
E1	Space research (active sensor) space station
E2	Space research (passive sensor) space station
E3	Space station in the Earth exploration-satellite service (active sensor)
E4	Space station in the Earth exploration-satellite (passive sensor)
E5	Space station in the aeronautical mobile-satellite (R) service
E6	Space station in the aeronautical mobile-satellite (OR) service
EA	Space station in the amateur-satellite service
EB	Space station in the broadcasting-satellite service (sound broadcasting)
EC	Space station in the fixed-satellite service
ED	Space telecommand space station
EE	Space station in the standard frequency-satellite service
EF	Space station in the radiodetermination-satellite service
EG	Space station in the maritime mobile-satellite service
EH	Space research space station
EI	Space station in the mobile-satellite service
EJ	Space station in the aeronautical mobile-satellite service
EK	Space tracking space station
EM	Space station in the meteorological-satellite service

An aerial photograph of a city street intersection. In the background, there is a large, modern building with a grid-like facade of windows. To the right, a tall, white skyscraper with many windows is visible. The foreground shows a multi-lane road with traffic, including a bus, several cars, and a motorcycle. There are trees and a pedestrian crossing in the middle ground. The overall scene is a typical urban environment.

Regulatory procedures (Non-Plan)

Regulatory Procedures of Articles 9 and 11

- **Not subject to coordination**

- **Submit** advance Publication Information (API)
- **Commenting** and **resolution of difficulties** procedure
- Submit **Notification** for recording
- **Bring into use** frequency assignments in a satellite in a respective orbit

- **Subject to coordination**

- **Submit** request for coordination (CR)
- **Commenting** and **coordination** procedure
- Submit **Notification** for recording
- **Bring into use** frequency assignments in a satellite in a respective orbit

How to know whether a frequency band is subject to coordination?

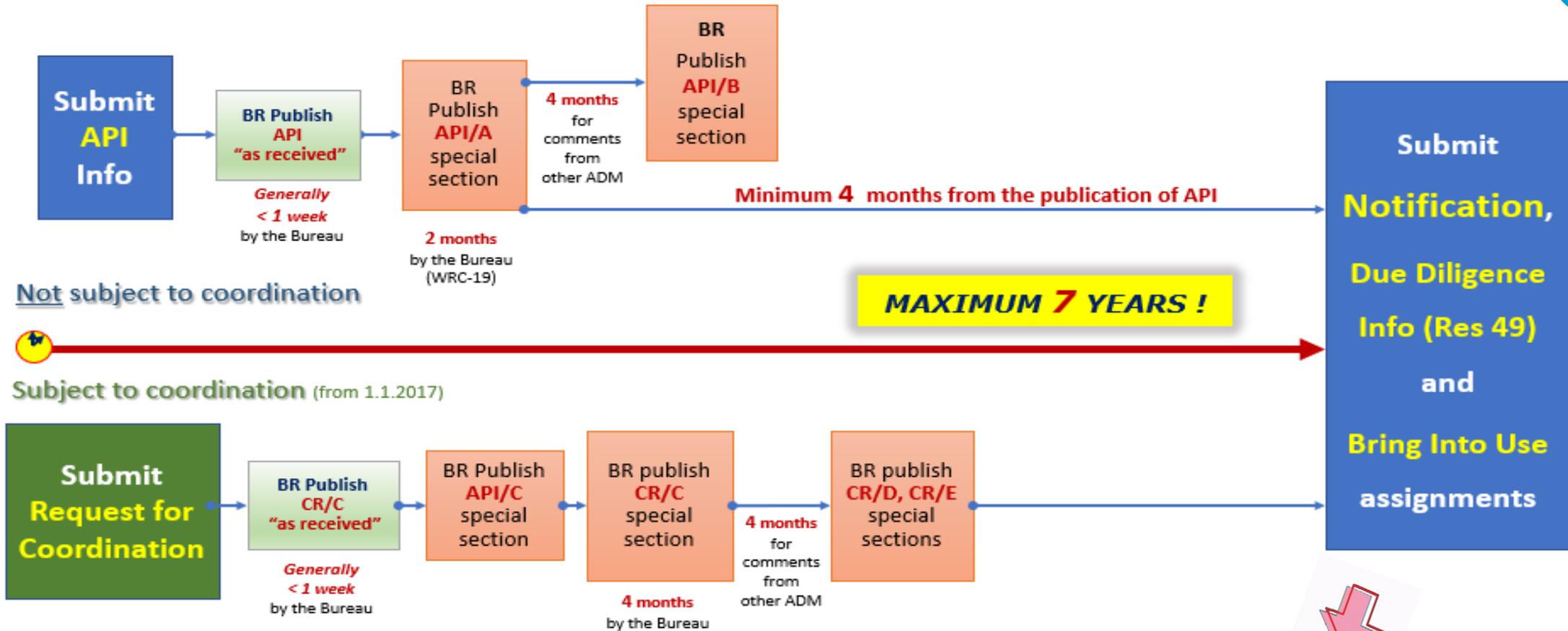
- *check the footnotes in the Table of Frequency Allocations in **Article 5***
- *Check Rules of Procedure relating to **No.9.11A***

Procedure for **not subject to coordination** are applicable to the following:

- For non-geostationary-satellite networks
 - For all the **non-geostationary-satellite networks** where the frequency bands/service are **not subject to the coordination procedure** under Section II of Article 9
 - Most small satellite projects fall under this category
- For geostationary-satellite networks
 - *Only for* the use of **inter-satellite links** of a geostationary space station **communicating with a non-geostationary space station which are not subject to the coordination procedure** under Section II of Article 9
 - Often used for geostationary data relay satellites

When we refer to “not subject to coordination”, it means the frequency assignments for the satellite networks or satellite systems are **not** subject to any of the coordination procedures spelt out in Section II of Article 9

ITU Regulatory Procedures



- Continuous use (No.13.6)
- Suspension (No.11.49)
- Extension of the period of Validity (Res 4)
-

Short Duration Mission– Res 32 (WRC-19)



- NGSO-SDM must meet the following criteria
 - Using bands not subject to coordination
 - total number of satellites ≤ 10
 - Period of validity ≤ 3 years, no possibility of extension, after which the recorded assignments shall be cancelled
 - shall have the capability to cease transmitting immediately in order to eliminate harmful interference (commitment required for Notification item A.24.a of Appendix 4)
 - Shall comply with the conditions for the use of the frequency band allocated
- Notifying administration must identify in the submission whether the non-GSO networks or systems is operating as short-duration mission (NGSO-SDM) (Appendix 4 data item A.1.g)
- For the following bands used for space operation service which are normally subject to coordination under Section II of Article 9, they are exempt from coordination procedures if submitted as NGSO-SDM under Res32 and meet all additional conditions:
 - 137.175-137.825 MHz downlink, exempt from No.9.21
 - Note that the use of the entire band 137.025-138 MHz for space operation service (space-to-Earth) is limited to NGSO-SDM under Res 32 and Res 660 (WRC-19)
 - 148-149.9 MHz uplink (must meet PFD limit to qualify for exemption)

Please read more details in **Res 32 (WRC-19)**:

<https://www.itu.int/en/ITU-R/space/support/nonGSO/RES32/Pages/default.aspx>

New!

ITU-R Small Satellite Handbook



The ITU-R Handbook on Small Satellites was developed in response to Resolution [ITU-R 68](#) on “Improving the dissemination of knowledge concerning the applicable regulatory procedures for small satellites, including nanosatellites and picosatellites”.

The Bureau published Circular Letter [4/LCCE/130](#) on 29 April 2021, inviting proposals for an ITU-R Small Satellite Handbook from both ITU-R members and non-members, with the purpose of increasing international cooperation, awareness-raising, regulatory guidance, technical assistance, and interference-free operations.

The Bureau also established a [webpage for the “Small Satellite Handbook”](#) to facilitate the submission of proposals and to provide details of the on-going work, related resolutions /reports/documents, contact information and other relevant information on the development of the ITU-R Small Satellite Handbook.

It has been approved by ITU **Study Group 4** on **7 July 2023**

- *Currently undergoing editorial reviews, expected to be released in Oct 2023*



Small Satellite Support:

<https://www.itu.int/en/ITU-R/space/Pages/supportSmallSat.aspx>



SSHB online:

www.itu.int/go/space/small-satellite-handbook

An aerial photograph of a modern university campus. The central focus is a large, multi-story building with a grid-like facade of glass and metal. To the left, there's another building with a blue-tinted glass facade. In the foreground, a busy street intersection is visible with several cars, a bus, and a motorcycle. The area is surrounded by green trees and a clear sky. The text 'BR Space Software and database' is overlaid in white on the central building.

BR Space Software and database

Information in electronics format - Res 55



Download the free BR software tools from: <https://www.itu.int/ITU-R/go/space-software/en>

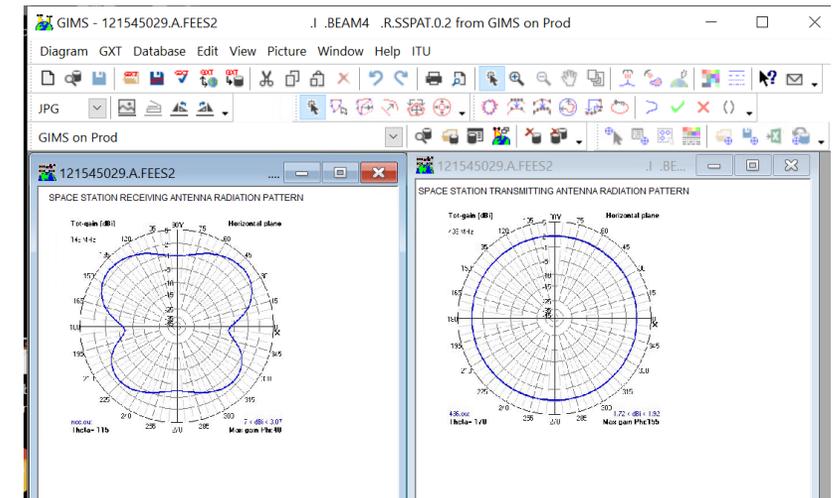
All AP4 information except graphical information

- Electronics format compatible with SpaceCap
- Use SpaceCap to capture the information
- SNS Format (currently version 9.1) mdb file
- Details in Chapter 1, Section III of the Preface to the BRIFIC



All graphical information

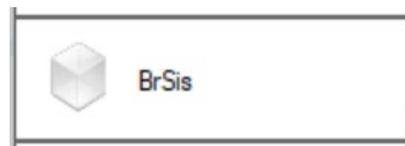
- Electronics format compatible with GIMS
- Use GIMs to capture the information
- GIMs format mdb file



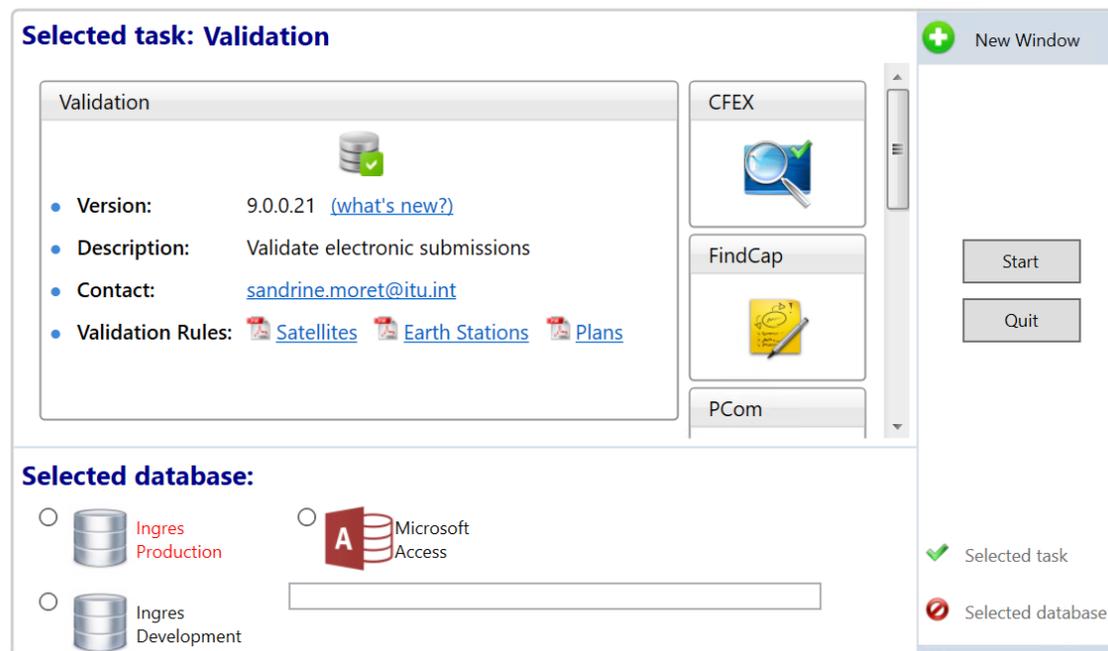
BRSIS - Validation:

Validate the filing to be sure no fatal errors

- To ensure that all mandatory information have been captured, run validation on the captured mdb files
- Cross validation should be run on both the SNS and GIMS mdb files
- In addition to checking the completeness of the files, the validation also checks for correctness of some fields
- The detailed validation rules are available with the software
- If fatal errors are identified by the software, these errors should be resolved before submitting the files to the Bureau



Space Information System (SNS v9)



The screenshot displays the software interface for the Space Information System (SNS v9). The main window is titled "Selected task: Validation". The "Validation" task is selected and shown in a large panel on the left, with a green checkmark icon. Below the task name, the following information is displayed:

- Version: 9.0.0.21 ([what's new?](#))
- Description: Validate electronic submissions
- Contact: sandrine.moret@itu.int
- Validation Rules: [Satellites](#) [Earth Stations](#) [Plans](#)

On the right side of the interface, there is a vertical list of tasks: "CFEX", "FindCap", and "PCom". The "CFEX" task is currently selected. Below the task list, there are "Start" and "Quit" buttons. At the bottom of the interface, the "Selected database:" section shows two options: "Ingres Production" (selected with a radio button) and "Ingres Development". A "Microsoft Access" option is also visible. A legend at the bottom right indicates that a green checkmark represents the "Selected task" and a red circle with a slash represents the "Selected database".

Download the free software tools from: <https://www.itu.int/ITU-R/go/space-software/en>

BRSIS - SpaceQry

The space query and extract system



A query tool that works on database of the SNS format

Available for free download at:

<https://www.itu.int/en/ITU-R/software/Pages/spaceqry.aspx>



Space Information System (SNS v9.1)

Selected task: SpaceQry

SpaceQry

- **Version:** 9.1.0.0 ([what's new?](#))
- **Description:** Query SNS formatted databases
- **Contact:** brsas@itu.int

SRS convert

Validation

Start

Quit

Selected database:

Microsoft Access BR IFIC DVD

Browse

Selected task

Selected database

loo

Set search criteria Favorites Clear SQL

Search

Quick SQL AdHoc

Standard BR IFIC DVD Builder Overlap

Type of notice

Non-Plan

Advance Publication

Coordination

Coordination (Earth station)

BSS/FSS Plan

Plan

Pending

List

SOF Art. 2A

Notification

Due Diligence

Administrative criteria

Notice Id. Status

Admin. Network Org.

BR IFIC no. Plan id.

Results: 3,611 rows found in srs_all.mdb

ntc_id	ntc_type	prov	act_code	adm
79520001	G	9.6	M	INS
88964342	G	S9.6	M	J
90500004	G	RR1060		CHN
90500005	G	RR1060		CHN
90500006	G	RR1060		CHN
90500008	G	RR1060		CHN
90500009	G	9.6	M	CHN
90500010	G	RR1060		CHN
90500011	G	RR1060	M	CHN
90500022	G	9.6	M	AUS
90500023	G	9.6	M	AUS
90500025	G	RR1060		AUS
90500031	G	RR1060		AUS
90500034	G	RR1060	M	CHN
90500035	G	RR1060		CHN
90500036	G	RR1060		CHN

Presentation available at: <https://www.itu.int/en/ITU-R/space/WRS22space/Overview%20SpaceQry%20WRS2022.pdf>

An aerial photograph of a modern university campus. The central focus is a large, multi-story building with a grid-like facade of glass and metal. To the left, another building with a blue-tinted glass facade is visible. In the foreground, a wide, multi-lane road with white lane markings and a blue-painted section runs across the frame. Several vehicles, including a white car, a dark car, a motorcycle, and a large bus, are on the road. The area is surrounded by green trees and a clear sky. The text "Space Online Services" is overlaid in the center in a large, white, sans-serif font.

Space Online Services

Space online services



<https://www.itu.int/en/ITU-R/space>

Currently in operation

- **e-Submission**

<https://www.itu.int/en/ITU-R/space/e-submission>

- a secure paperless electronic approach for Administrations and Operators to submit all satellite network filings and comments with any attachment files.
- Restricted to designated users of member states and their operators

- **e-Communication**

<https://www.itu.int/ITU-R/go/space-communications>

- an online communication platform to allow administrations and the Bureau to send and receive administrative correspondences related to space services through an online interface.
- Restricted to designated users of member states and their operators

- **SNS online** <https://www.itu.int/sns>

- An online query system that provide full access to all data in the ITU Master International Frequency Register
- Restricted to TIES account users (ITU member organizations)

- **SNL online** <https://www.itu.int/ITU-R/go/space/snl/en>

- An online query system that provide various list of satellite networks, including a list of publication
- Available to all public

- **SIRRS**

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

- Satellite Interference Reporting and Resolution System
- Restricted to designated users of member states and their operators

<https://www.itu.int/en/ITU-R/space>

Space online services

<https://www.itu.int/en/ITU-R/space>



Under beta testing

- **Space explorer**

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

- An online query system that provide full access to all data in the ITU Master International Frequency Register
- Open to all users

- **BRIFIC online**

<https://www.itu.int/epublications/brific-space>

- a new online application to browse the BR IFIC (Space services) content and to download the relevant information (publications and databases)

Contact Addresses of Notifying Administrations (Space services)

https://www.itu.int/online/mm/scripts/org_br_admin.list

Contact addresses of notifying administrations (Space services)

From the list of all symbols and designations for Administrations, the contact addresses f

Symbol	Designation
AFG	Afghanistan
AFS	South Africa
AGL	Angola
ALB(S)	Albania
ALG(S)	Algeria
AND	Andorra
ARG(S)	Argentina
ARM	Armenia
ARS	Saudi Arabia
ARS/ARB	Saudi Arabia
ATG	Antigua and Barbuda
AUS(S)	Australia
AUT	Austria
AZE	Azerbaijan
B(S)	Brazil
BAH	Bahamas
BDI	Burundi
BEL	Belgium
BEN	Benin
BFA	Burkina Faso

Example:

Administration: South Africa

AFS	Independent Communications Authority of South Africa (ICASA) 350 Witch Hazel Avenue Private Bag X10002 Eco Point Office Park Eco Park Centurion South Africa Fax: +27 12 568 4195 +27 12 568 3291 Email: mmuchunu@icasa.org.za
-----	--

NB: Fax+Email displayed only if Owner=BR_SSD : Email:Official=true, Fax:DoNotUse=false
If "e-Communications Only" is shown, it is recommended that a correspondence is delivered to the Administration by only [e-Communications](#).

Reminder to all administrations:

- Make sure that an official email address has been communicated to the Bureau
- To inform the BR whenever there is any update to the contact information
- If you wish to communicate with the Bureau solely through e-Communication, please send a request to the BR

Operating Administrations and Agencies (Tables 12A/12B of Preface)

https://www.itu.int/en/ITU-R/terrestrial/fmd/Pages/tables_12A_12B.aspx

Example:

List of all symbols and designations for administrations and geographical areas contained in Tables 12A 12B

YOU ARE HERE ITU > HOME > ITU-R > TERRESTRIAL SERVICES > FIXED AND MOBILE SERVICES DIVISION > LIST OF ALL SYMBOLS AND DESIGNATIONS FOR ADMINISTRATIONS AND GEOGRAPHICAL AREAS CONTAINED IN TABLES 12A 12B



GLAD

BACK TO ITU MAIN

Download .xlsx

List of all symbols and designations for administrations and geographical areas contained in Tables 12A 12B

Symbol	Designation
ABW	Aruba
AFG	Afghanistan
AFS	South Africa (Republic of)
AGL	Angola (Republic of)
AIA	Anguilla
ALB	Albania (Republic of)
ALG	Algeria (People's Democratic Republic of)
ALS	Alaska (State of)
AMS	Saint Paul and Amsterdam Islands
AND	Andorra (Principality of)

Addresses of the Administrations Responsible for the Stations and Operating Agencies: AFS - South Africa (Republic of)

Address(es)

A

INDEPENDENT COMMUNICATIONS
AUTHORITY OF SOUTH
AFRICA (ICASA)
PIN MILL FARM, BLOCKS A, B, C & D
PRIVATE BAG X10002
SANDTON 2146
SOUTH AFRICA

B

DEPARTMENT OF TRANSPORT,
DIVISION OF CIVIL AVIATION,
PRETORIA

Electronic Addresses

Code	Name
TELEFAX	+27 11 444 1919
TELEX	095 357793 = RADIO
EMAIL	info@icasa.org.za
PHONE	+27 11 566 3000

C

DEPARTMENT OF DEFENCE,
GENERAL HEADQUARTERS,
PRETORIA

D

GENERAL MANAGER,
SOUTH AFRICAN RAILWAYS AND HARBOURS,
JOHANNESBURG

E

DIRECTOR GENERAL,
SOUTH AFRICAN BROADCASTING
CORPORATION,
JOHANNESBURG

Operating Agencies

Code	Name
001	DEPARTMENT OF POSTS AND TELEGRAPHS
002	DEPARTMENT OF TRANSPORT, DIVISION OF CIVIL AVIATION
003	DEPARTMENT OF DEFENCE
004	SOUTH AFRICAN BROADCASTING CORPORATION
005	SOUTH AFRICAN RAILWAYS AND HARBOURS
006	PRIVATE
007	GEOLOGICAL SURVEY DEPARTMENT
008	GEOPHYSICAL RESEARCH
009	SOUTH AFRICAN POLICE
010	NAMIBIAN ADMINISTRATION
011	EMBASSY OF SWITZERLAND IN PRETORIA
012	FIRE FIGHTING
013	BOPHUTHATSWANA
014	RED CROSS ORGANIZATION
015	S.A.N.F.
016	BOTSWANA POLICE
017	DEPARTMENT OF NATIVE AFFAIRS
019	BOTSWANA ADMINISTRATION
021	SWAZILAND ADMINISTRATION
022	UNITED KINGDOM GOVERNMENT
023	ADMIRALTY, LONDON
024	OSTERREICHISCHE BOTSCHAFT
025	EMBASSY OF HUNGARY IN PRETORIA
026	DEPARTMENT OF SCIENCE AND TECHNOLOGY OF THE REPUBLIC OF SOUTH AFRICA
027	DRAGONFLY AEROSPACE

Reminder to all administrations:

- Please keep BR informed of any updates
- Send a request to BR for any new operating agencies

As-received – Resolution 55 (Rev. WRC-19)

All notices are published “as received”, **within 30 days** of receipt and made **freely available** on ITU website:
<https://www.itu.int/ITU-R/space/asreceived/Publication/AsReceived>



The screenshot shows the ITU logo and the text "e-Submission of Satellite Network Filings". Below this is a navigation bar with the following items: Home, Submissions, As-Received (highlighted), Users, Log, and Email template. Under the "As-Received" item, there are sub-items: Published and Comments.

Information "As Received"

Contains text Select administration... ▾ Advance publication info... × ▾ Orbit type filter... ▾

Export ◁ ◁ 1 2 3 ▷ ▷

NTC ID	Adm.	Network Org.	Station/Satellite Name	Long. Nom.	▼ BR Registry Date	Type of submission	Reg	Act. Code
120545268	TUR		GRIZU-263A		11.11.2020	Advance publication information		A
120545267	NOR		TYVAK-182A		10.11.2020	Advance publication information		M
120545266	POL		SWIATOWID 2		10.11.2020	Advance publication information		M
120545265	J		HSU-SAT1		10.11.2020	Advance		A

Official Publication – BR IFIC (Space services)

<https://www.itu.int/ITU-R/go/space-brific/en>

On DVD



Online (currently under beta testing)

SPECIAL SECTION / PART	PLAN PART	RESPONSIBLE ADMINISTRATION		NAME OF THE SPACE STATION	ORB. POS.	NAME OF THE ASSOCIATED EARTH STATION	IDENTIFICATION NUMBER
		ADM.	INTERG. ORG.				
AP30/E/603	B	HOL		NSS-BSS 40.5W	-40.5		112552016
AP30A/E/603	B	HOL		NSS-BSS 40.5W	-40.5		112554016
API/A/12363 MOD-1		CHN		GRID	NGSO		120545200 / 1
API/A/12403 MOD-2		CHN		CAS-7	NGSO		120545193 / 1
API/A/12616		USA		CAPELLA-2 (SEQUOIA)	NGSO		120545162
API/A/12632	I			WILDTRACKCUBE-SIMBA	NGSO		120545182
API/A/12633		CHN		DMT-SY	NGSO		120545183
API/A/12637		SNG		NUX-1	NGSO		120545192
API/A/12638		CHN		GEESAT-JL	NGSO		120545194
API/A/12639		CHN		SVOM	NGSO		120545196
API/A/12640		CHN		AID-01	NGSO		120545197
API/A/12641		CHN		BIFEST-1	NGSO		120545198

Cost recovery for satellite network filings



General

- All satellite network filings submitted by the Bureau will be issued a cost recovery fee in accordance to **Council Decision 482**
- Amateur-satellite service is exempted from cost recovery fee
- If payment is not received by the payment due date, the notice will be cancelled, but the invoice continues to be payable!
- Each modification notice is charged separately like a new notice
- **More information at**
<https://www.itu.int/en/ITU-R/space/costrecovery>

Cost recovery fees

- **Not** subject to coordination
 - Flat fee per filing
 - **API** fee: **570** CHF
 - **Notification** fee: **7030** CHF
- Subject to coordination
 - Variable fee, depending on the number of units and forms of coordination applicable to the filing
 - Coordination Request fee: from 5K to 66K CHF
 - Notification fee: from 15K to 86K CHF

Free online ITU-R Publications



**Radio Regulations
New edition 2020!**

- **ITU-R Radio Regulations 2020**
<http://www.itu.int/pub/R-REG-RR/>
- **ITU-R RoP**
<http://www.itu.int/pub/R-REG-ROP/en>
- **ITU-R Recommendations**
<http://www.itu.int/publ/R-REC/>
- **ITU-R Reports**
<https://www.itu.int/pub/R-REP/>
- **ITU-R CR CIR**
<https://www.itu.int/md/R00-CR-CIR/en>

Free online ITU-R Publications



- **Latest BR Software** <https://www.itu.int/ITU-R/go/space-software/en>
- **SNL online** - *basic reference info concerning space stations*
 - <https://www.itu.int/ITU-R/space/snl/index.html>
- **SNS online** - *TIES account required, need to be an ITU member (member state, ITU-R sector member, associate or academia)*
 - <https://www.itu.int/sns/>
- **BR Space Service Support** <https://www.itu.int/en/ITU-R/space>
- **API support** <https://www.itu.int/en/ITU-R/space/Pages/API.aspx>
 - [PDF GUIDE TO CAPTURE OF DIAGRAMS AND ATTACHMENTS FOR NON-GSO SATELLITE NETWORKS](#)
- **WRS-22 Seminar** <https://www.itu.int/wrs-22/>
 - <https://www.itu.int/wrs-22/workshops/space-workshops/>

Free online ITU-R Publications



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

- **Handbook for amateur and amateur-satellite services**

<https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-52-2014&media=electronic>

- **Handbook for earth exploration satellite service**

<https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-56-2011&media=electronic>

- **Handbook for meteorological-satellite service**

<https://www.itu.int/en/publications/ITU-R/Pages/publications.aspx?lang=en&media=electronic&parent=R-HDB-45-2017>

- **Handbook for space research service**

<https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-43-2013&media=electronic>

New!

- **Small Satellite Handbook**

www.itu.int/go/space/small-satellite-handbook

Thank you!

ITU – Radiocommunication Bureau

Questions to

brmail@itu.int

spacehelp@itu.int

xiuqi.wang@itu.int

<https://www.itu.int/en/ITU-R/space>

