

ITUEvents

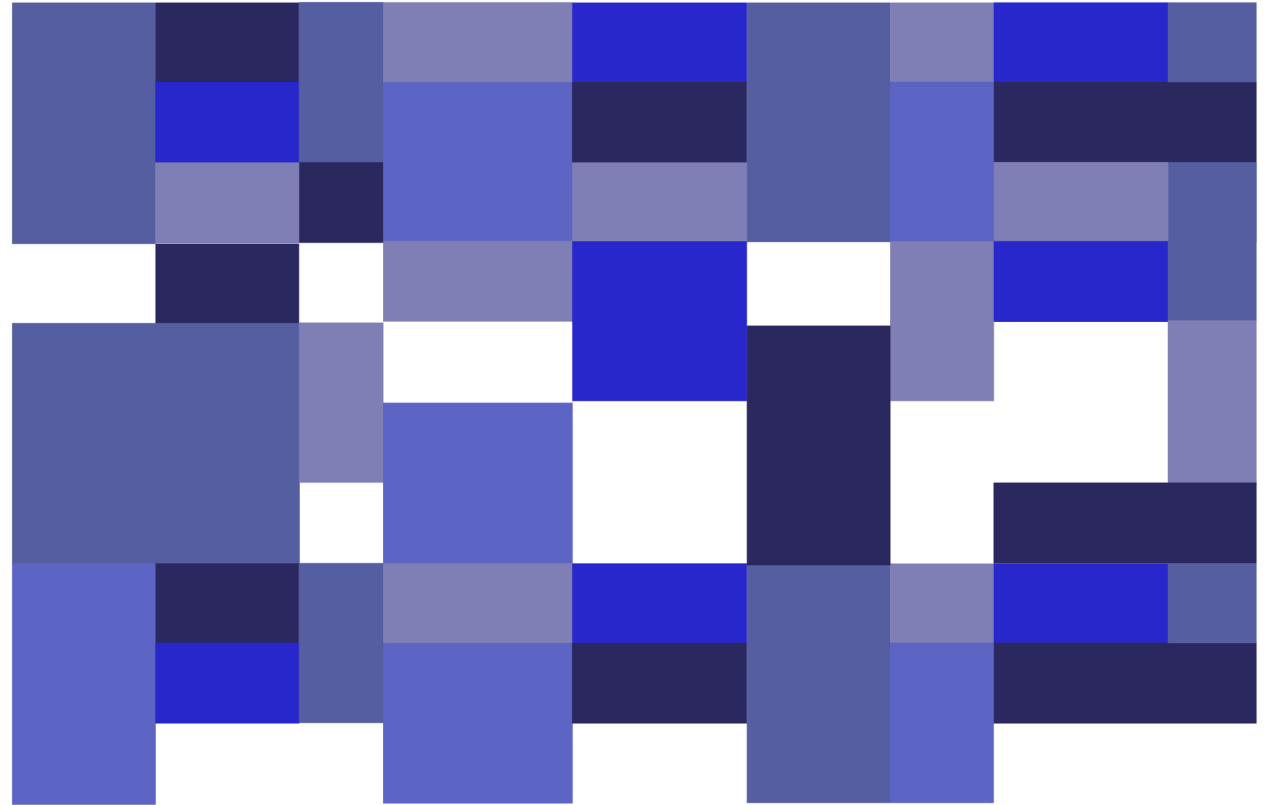
Workshop for Region 2 (RR)

National tables of frequency allocation (NTFA)

17-20 June 2024

Mexico City, Mexico

itu.int/go/ITU-R/NTFA-R2-WS-24



Organized by:



ITU RADIO REGULATIONS

Joaquin RESTREPO

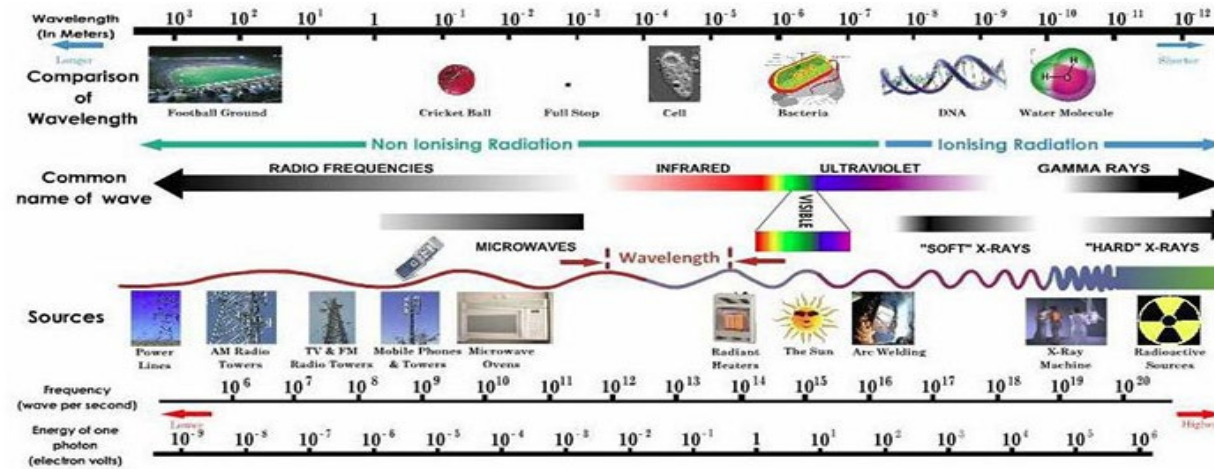
Capacity Building Coordinator,
Study Groups Department, SGD
Radiocommunication Bureau, BR

International Telecommunications Union, ITU

RADIOELECTRIC SPECTRUM

- **RR 1.3: Telecommunication:** Any transmission, emission or reception of signs, signals, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems.
- **RR 1.5: Radio waves (or hertzian waves):** Electromagnetic waves of frequencies arbitrarily lower than 3000 GHz, propagated in space without artificial guide. (usually refers as: “radio”)

- **RR. 1.6 Radiocon**



RADIOELECTRIC vs. ELECTROMAGNETIC SPECTRUM

- **Radioelectric Spectrum** is the lower part of Electromagnetic Spectrum, used for Telecommunications
- Expression: “**Spectrum**” refers by default to Radioelectric Spectrum
- Communications systems that DO NOT use Spectrum (in red) may be regulated (National/International); but their regulatory framework is different than Spectrum Regulations

	Frequencies < 3.000 GHz?	Free Propagation?	Radioelectric Spectrum?
Infra-red Wireless link	NO	YES	NO
Cable TV (Coaxial)	YES	NO	NO
Optical Fiber	NO	NO	NO
Broadcasting TV	YES	YES	YES

SPECTRUM AS NATURAL RESOURCE

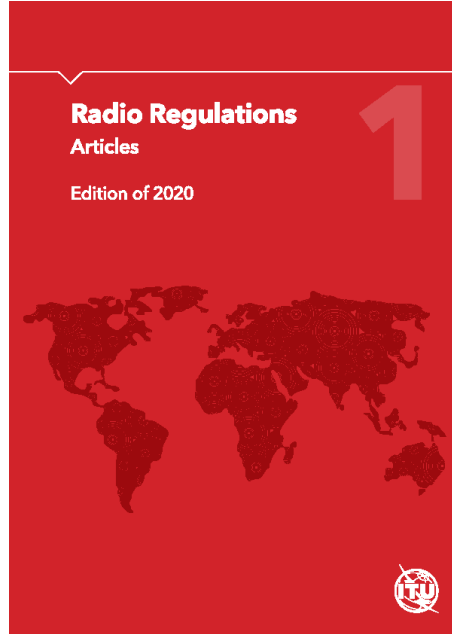
- - Natural Resource: phenomena of nature
- - Non-replicable: cannot be reproduced (as agriculture)
- Scarce: quantity of information (Mbps per MHz) that can be transmitted is limited
- Need to be "shared" by stations using same frequency
- Spectrum Management and Regulation aim to guarantee and efficient and rational use of Spectrum, both and national and international levels
- **Main goal:** prevent and control Interferences: maximize sharing while minimize prejudicing

SPECTRUM AS NATURAL RESOURCE

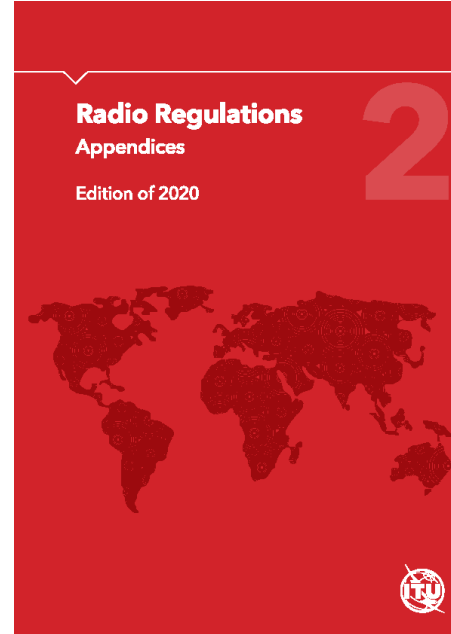
- *Principles in the Preamble to the Radio Regulations:*
- *“No. 0.3 In using frequency bands for radio services, Members shall bear in mind that radio frequencies and the geostationary-satellite orbit are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of these Regulations, so that countries or groups of countries may have equitable access to both, taking into account the special needs of the developing countries and the geographical situation of particular countries (No. 196 of the Constitution).”*
- *“No. 0.4 All stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Members or of recognized operating agencies, or of other duly authorized operating agencies which carry on a radio service, and which operate in accordance with the provisions of these Regulations (No. 197 of the Constitution).”*

ITU RADIO REGULATIONS, RR

- Spectrum cannot be limited to a given territory; international coordination is necessary
- ITU Radio Regulations (RR) is an International Treaty, elaborated and revised by administrations and membership, during World Radio Conferences (WRC); RR has a binding nature for ITU Member states.
- ITU acts as depositary of RR
- Last version: RR-20 (as revised during WRC-19)
- RR can be downloaded, free of charge, for the general public, in the 6 UN Languages, at: <https://www.itu.int/pub/R-REG-RR-2020>



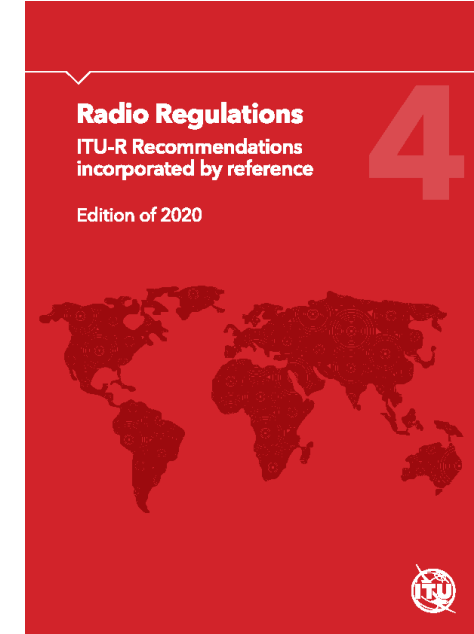
VOLUME 1:
Articles
(59)



VOLUME 2:
Appendices
(23)*



VOLUME 3:
Resolutions (182)*
and
Recommendations (25)*



VOLUME 4:
ITU-R Recommendations
incorporated by reference
(40)*

* Non-consecutive numbering, some with number and letters

RADIO REGULATIONS: VOLUME 3 and 4

RR Resolutions	ITU-R Resolutions
from World Radio Conferences	from Radio Assemblies
Radio Regulations Volume 3 (last version: 2016)	Book of ITU-R Resolutions (last version: 2016)
RESOLUTION Number (WRC-year)	RESOLUTION ITU-R Number-Version (year)
RESOLUTION 763 (WRC-15): Stations on board sub-orbital vehicles RESOLUTION 7 (REV. WRC-03): Development of national radio-frequency management	RESOLUTION ITU-R 69 (2015): Development and deployment of international public telecommunications via satellite in developing countries RESOLUTION ITU R 11-5 (2015): Further development of the Spectrum Management System for Developing Countries
https://www.itu.int/pub/R-REG-RR-2016	https://www.itu.int/pub/R-VADM-RES/en
RR Recommendations	ITU-R Recommendations
from World Radio Conferences	from Study Groups
Radio Regulations Volume 3 (last version: 2016)	ITU-R Study Groups
RECOMMENDATION Number (WRC-year)	RECOMENDATION ITU-R Serie Number-Version (month/year)
RECOMMENDATION 724 (WRC-07): Use by civil aviation of frequency allocations on a primary basis to the fixed-satellite service RECOMMENDATION 34 (REV.WRC-12): Principles for the allocation of frequency bands	RECOMMENDATION ITU-R SM.2103-0 (09/2017): Global harmonization of short-range devices categories RECOMMENDATION ITU-R SM.1723-2 (09/2011): Mobile spectrum monitoring unit
https://www.itu.int/pub/R-REG-RR-2016	https://www.itu.int/pub/R-REC

Examples:

16.2 *The international monitoring system in accordance with Resolution ITU-R 23 and the most recent version of Recommendation ITU-R SM.1139.....*

1.14 *Coordinated Universal Time (UTC): Time scale, based on the second (SI), as described in Resolution 655 (WRC-15).*

5.548 *In designing systems for the inter-satellite service in the band 32.3-33 GHz, bearing in mind the safety aspects of the radionavigation service (see Recommendation 707).*

ITU-R Recommendations Incorporation

List and the end of Vol. 4



Cross-reference list of the regulatory provisions, including footnotes and Resolutions, incorporating ITU-R Recommendations by reference

Compulsory (by incorporation):

- Linked by the expression: “*shall*”
- version explicitly indicated;
- No automatic update*;
- Solely applies to the pertinent item, otherwise, is voluntary

Voluntary: X

- Linked by the expression: “*should*” or any other text than “*shall*”
- version is NOT indicated;
- Automatic update (“*most recent version of*”)
- Apply to all Recommendations not explicitly cited on the list and item
- **TIP:** NO version = Reference; “-version” : incorporation

Recommendation ITU-R	Title of the Recommendation	RR provisions and footnotes with ITU-R Recommendations contained in RR Volume 4
TF.460-6	Standard-frequency and time-signal emissions	No. 1.14 (via Resolution 655 (WRC-15))
M.476-5	Direct-printing telegraph equipment in the maritime mobile service	Nos. 19.83, 19.96A, 51.41
M.489-2	Technical characteristics of VHF radiotelephone equipment operating in the maritime mobile service in channels spaced by 25 kHz	Nos. 51.77, 52.231, Appendix 18 (<i>General notes e</i>)
M.492-6	Operational procedures for the use of direct-printing telegraph equipment in the maritime mobile service	No. 56.2
P.525-2	Calculation of free-space attenuation	No. 5.444B (via Resolution 748 (Rev.WRC-15))

ITU-R Recommendations Incorporation: Examples

Voluntary:

16.6 Administrative of the international monitoring system should be in accordance with the most recent version of Recommendation ITU-R SM.1139.

21.2.2 Information on this subject is given in the most recent version of Recommendation ITU-R SF.765

Incorporated:

19.102 3) The types of maritime mobile service identities shall be as described in Annex 1 of Recommendation ITU-R M.585-7.

Be careful!:

19.108A The maritime identification..... Furthermore, as indicated in the most recent version of Recommendation ITU-R M.585, some maritime....

M.585-7 (Annex 1)	Assignment and use of identities in the maritime mobile service	Nos. 19.99, 19.102, 19.111
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25.6 2) Administrations shall verify Guidance for standards of competence may be found in the most recent version of Recommendation ITU-R M.1544.

ITU-R Recommendations Incorporation

Recommendation P.525

Approved in 2016-11

Managed by R00-SG03

Main			
Number	Title	Status	Questions
P.525-3 (11/2016)	Calculation of free-space attenuation Note - A previous version of this Recommendation is incorporated by reference in the Radio Regulations.	In force (Main)	N/A
Previous versions			
Number	Title	Status	Questions
P.525-2 (08/94)	Calculation of free-space attenuation Note - This version of the Recommendation is incorporated by reference in the Radio Regulations.	Superseded	N/A

Updating of ITU-R Recs on Vol 4 shall be decided by WRCs (**no** automatic update!)

* **WRC-19 a.i. 2:** *to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution 28 (Rev.WRC-15), and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution 27 (Rev.WRC-12)*

RADIO REGULATIONS: VOLUME 1

- **CHAPTER I** – Terminology and technical characteristics
- **CHAPTER II** – Frequencies
- **CHAPTER III** – Coordination, notification and recording of frequency assignments and Plan modifications
- **CHAPTER IV** – Interferences
- **CHAPTER V** – Administrative provisions
- **CHAPTER VI** – Provisions for services and stations
- **CHAPTER VII** – Distress and safety communications
- **CHAPTER VIII** – Aeronautical services
- **CHAPTER IX** – Maritime services
- **CHAPTER X** – Provisions for entry into force of the Radio Regulations

RR: KEY DEFINITIONS

- RR, No. 1.19 Radiocommunication service:** A service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes.
- RR, No. 1.61 Station:** One or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service, or the radio astronomy service

Terrestrial Services (<u>NO</u> satellite links)	
Fixed	
Broadcasting	
Mobile	Land mobile
	Aeronautical mobile
	Maritime mobile
Radiodetermination	Radionavigation
	Radiolocation

but also

Amateur
Standar Frequenct and Time
Meteorological Aids
.
.

and more

Space Services (satellite links)	
Fixed-satellite	
Broadcasting-satellite	
Mobile-satellite	Land mobile-satellite
	Aeronautical mobile-satellite
	Maritime mobile-satellite
Radiodetermination-satellite	Radionavigation-satellite
	Radiolocation-satellite

but also

Amateur-satellite
Radio Astronomy
Space Research
.
.

and more

41 different types of **Services** (RR 1.20 to 1.60)

53 different types of **Stations** (RR 1.65 to 1.115)

RR: Radioelectric Services

1.116 public correspondence: *Any telecommunication which the offices and stations must, by reason of their being at the disposal of the public, accept for transmission (CS). [CS 1004]*

1.7 terrestrial radiocommunication: Any radiocommunication other than space radiocommunication or radio astronomy.

1.8 space radiocommunication: Any radiocommunication involving the use of one or more space stations or the use of one or more reflecting satellites or other objects in space.

1.20 fixed service: A radiocommunication service between specified fixed points

1.38 broadcasting service: A radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, television transmissions or other types of transmission (CS). [CS 1010]

RR: Radio Stations and Systems

1.61 station: One or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service, or the radio astronomy service.

1.64 space station: A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the Earth's atmosphere.

1.62 terrestrial station: A station effecting terrestrial radiocommunication.
In these Regulations, unless otherwise stated, any station is a terrestrial station

1.63 earth station: A station located either on the Earth's surface or within the major portion of the Earth's atmosphere and intended for communication:

- with one or more space stations; or
- with one or more stations of the same kind by means of one or more reflecting satellites or other objects in space.

1.69 land station: A station in the mobile service not intended to be used while in motion.

RR	English	Français	Español	tip
1.62	Terrestrial Station	Station de Terre	Estación Terrenal	not Space
1.63	Earth Station	Station Terrienne	Estación Terrena	link Earth <-> Space
1.69	Land Station	Station Terrestre	Estación Terrestre	not Maritime nor Aeronautical

RR: ALLOCATIONS vs. ASSIGNMENTS

RR, No. 1.16 allocation (of a frequency band): Entry in the [Table of Frequency Allocations*](#) of a given frequency band for the purpose of its use by one or more terrestrial or space radiocommunication [services](#) or the radio astronomy service under specified conditions. This term shall also be applied to the frequency band concerned.

RR, No. 1.17 allotment (of a radio frequency or radio frequency channel): Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more administrations for a terrestrial or space radiocommunication service in one or more identified countries or geographical areas and under specified conditions.

RR 1.18 assignment (of a radio frequency or radio frequency channel): Authorization given by [an administration](#) for a radio [station](#) to use a radio frequency or radio frequency channel under specified conditions.

Frequency distribution to	French	English	Spanish	Arabic	Chinese	Russian
Services	Attribution (attribuer)	Allocation (to allocate)	Atribución (atribuir)	توزيع (يوزع)	划分	распределение (распределять)
Areas or countries	Allotissement (allotir)	Allotment (to allot)	Adjudicación (adjudicar)	تعيين (يعين)	分配	выделение (выделять)
Stations	Assignation (assigner)	Assignment (to assign)	Asignación (asignar)	تخصيص (يخصص)	指配	присвоение (присваивать)

Allocations are granted to Radiocommunications **Services**

Assignments are granted to Radiocommunications **Stations**

NOTE: Most of dictionaries display the expressions "**Allocation**" and "**Assignment**" as being [synonymous](#); in the context of [Spectrum Management and Regulation](#) **they are different**.

RR: Allocations vs. Assignments

Art. 4.4: *Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.*

RR: Terrestrial vs Space Services

	TERRESTRIAL	vs	SPACE
KEY PLAYERS	ITU, NRA		ITU, COPUOS, NRA et al
RESOURCE	FREQUENCIES		FREQUENCIES + ORBITS
ALLOCATION	RADIO REGULATIONS then NFAT		RADIO REGULATIONS (Uplink, Downlink, Sat-Sat) then NFAT
ALLOTMENT*	NATIONAL RULES (Uplink, Downlik) (voluntary: ITU-R Rec)		RADIO REGULATIONS** (Uplink, Downlink, Sat-Sat) then NATIONAL RULES
ASSIGNMENT*	NATIONAL RULES (Uplink, Downlik)		
LICENSING			NATIONAL RULES COPUOS

* Excluding Vol 2 (Appendices)

** International Recognition of a Satellite Network doesn't conduct to any national "landing right" that is a autonomous and sovereign right of every administration

RR: OTHER CONCEPTS

- **Other concepts:** although not explicitly defined, on the RR when dealing with band allocations (Art. 5), the use into footnotes of expressions: “*identified*” and “*designated*” express the interest/intention of some administrations on a future use of that band for a specific application; that in benefit of a mid- and long-term harmonization of the use of that band. Examples*:
- **RR, Nos. 5.138, 5.150,....:** Bands designated for industrial, scientific and medical (ISM) applications.
- **RR, No. 5.552A.... :** Bands designated for use by high Altitude Platform Stations (HAPS)
- **RR, No. 5.516B.....:** bands identified* for use by High-Density applications in the fixed-satellite service (*also named: High Throughput Satellites, HTS*)
- **RR, Nos. 5.286AA, 5.313.A,....:** Bands identified* for International Mobile Telecommunications (IMT)
- *: Footnotes stated that: “*This identification does not preclude the use of this band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations*”.

RR: ALLOCATION PRINCIPLES

- RR is technically neutral*, hence, it
 1. Does **allocate** frequency **bands** to radiocommunication **services**
 2. Does **not** allocate to specific **applications**
 3. Does **not** allocate to particular **technologies**
 4. Does **not** define user **profiles** (**official, commercial, private, etc.**)

• e.g.: allocation can be made to: "mobile" (service; by default: terrestrial, land)

- not specifically to :

a) cellular networks (application)

b) GSM, LTE, Wimax, etc. (technology)

* *Administrations might go further (applications, technologies, profile, etc.) while being consistent with the RR*

RR: Table of Frequency Allocations

5.25 a) services in “**CAPITAL CASE**” (example: FIXED) are “primary” category (primary basis)

5.26 b) services in “Normal cases” (example: Mobile) are “secondary” category (secondary basis)

5.48 3) services are listed by category then in alphabetical order according to the French language. The order of listing does not indicate relative priority within each category.

5.50 5) The footnote references which appear in the Table below the allocated service or services apply to more than one of the allocated services, or to the whole of the allocation concerned.

5.51 6) The footnote references which appear to the right of the name of a service are applicable only to that particular service.

RR: CATEGORIES OF SERVICES

- 5.25 a) services in "CAPITAL CASE" (example: FIXED) are "PRIMARY" category (primary basis)
- 5.26 b) services in "Normal cases" (example: Mobile) are "Secondary" category (secondary basis)
- 5.48 3) services are listed by **category** then in **alphabetical order (French language)**. The order of listing does not indicate relative priority within each category.

• Stations of secondary service: Non-Interference/Non-Protection (N/NP) vs PRIMARY service

• a) shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date

• b) cannot claim protection from harmful interference from stations of a primary service to which frequencies are already assigned or may be assigned at a later date

• c) can claim protection, however, from harmful interference from stations of the same or other secondary service(s) to which frequencies may be assigned at a later date**

• (**first in time, first in right)

متنقلة بحرية

无线电定位

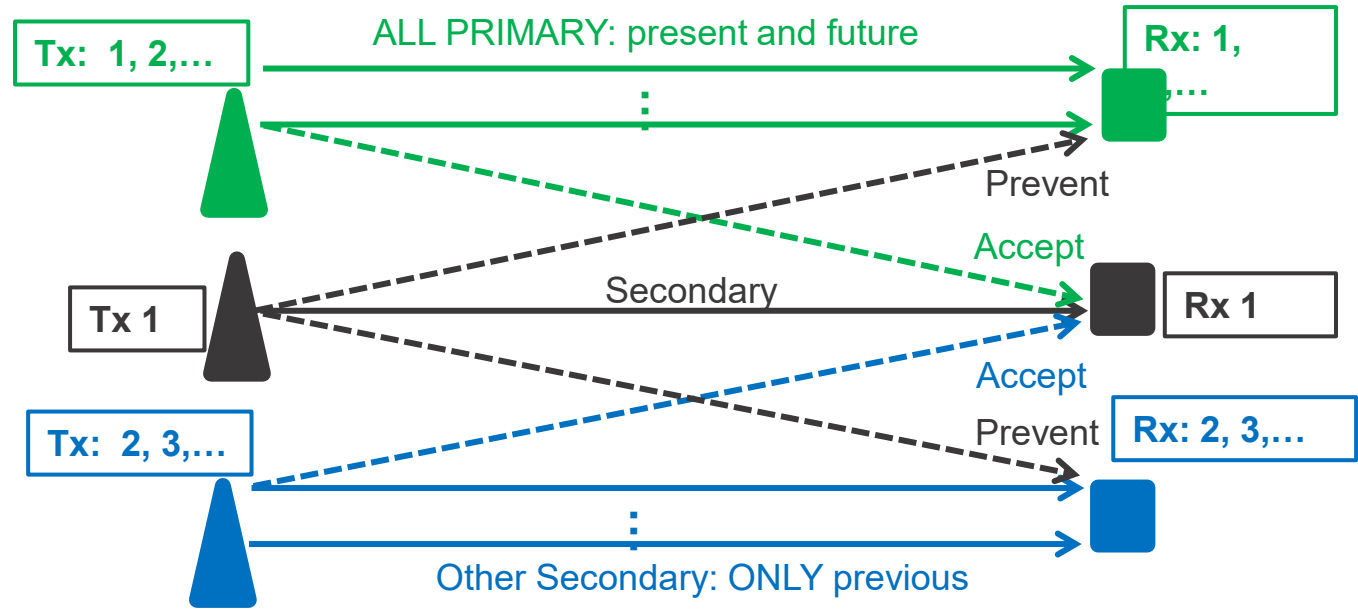
متنقلة بحرية

无线电定位

• Arabic & Chinese versions, PRIMARY → bold characters:

• PRIMARY:

RADIO REGULATIONS: CATEGORIES OF SERVICES



NI/NP: No interference to / No Protection from

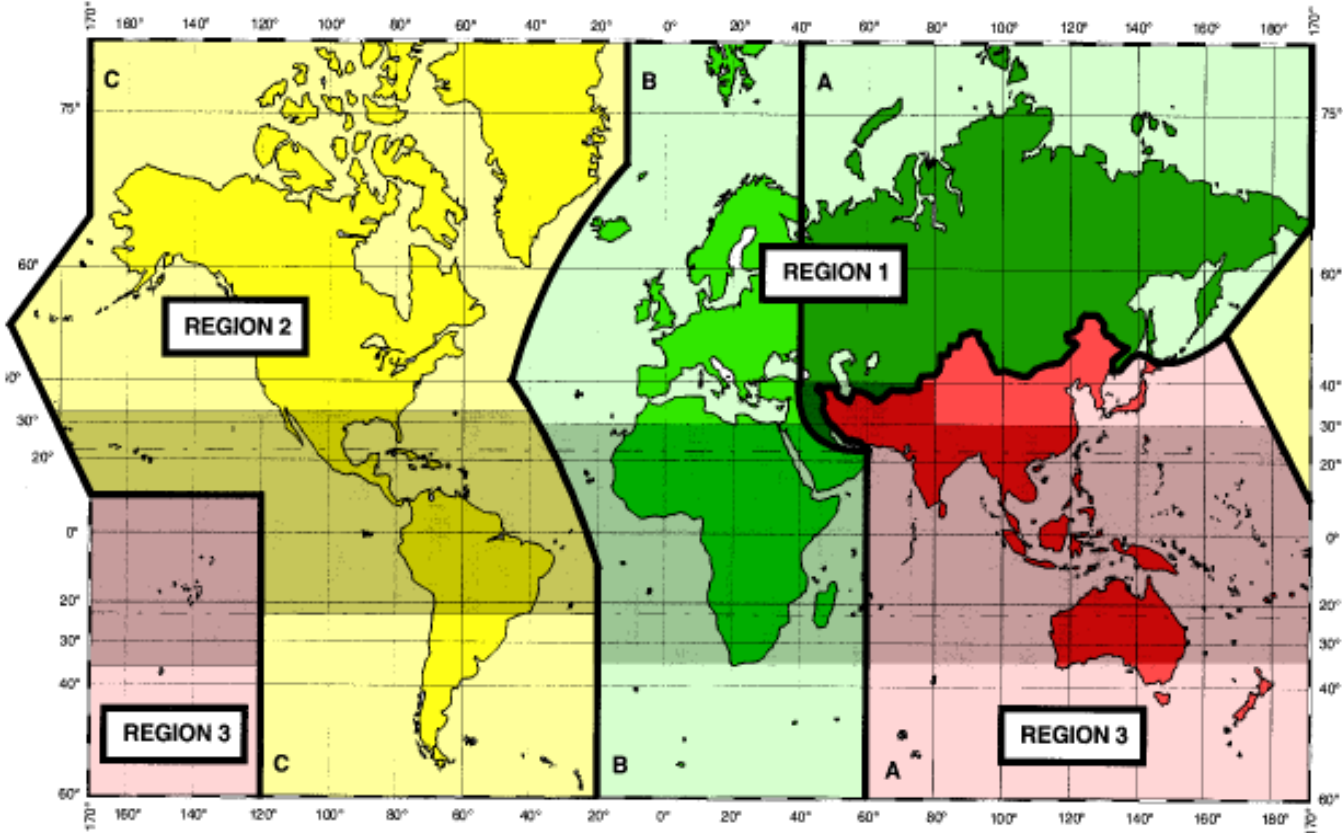
Frequency Bands

Band number	Symbols	Frequency range (lower limit exclusive, upper limit inclusive)	Corresponding metric subdivision
4	VLF	3 to 30 kHz	Myriametric waves
5	LF	30 to 300 kHz	Kilometric waves
6	MF	300 to 3 000 kHz	Hectometric waves
7	HF	3 to 30 MHz	Decametric waves
8	VHF	30 to 300 MHz	Metric waves
9	UHF	300 to 3 000 MHz	Decimetric waves
10	SHF	3 to 30 GHz	Centimetric waves
11	EHF	30 to 300 GHz	Millimetric waves
12		300 to 3 000 GHz	Decimillimetric waves

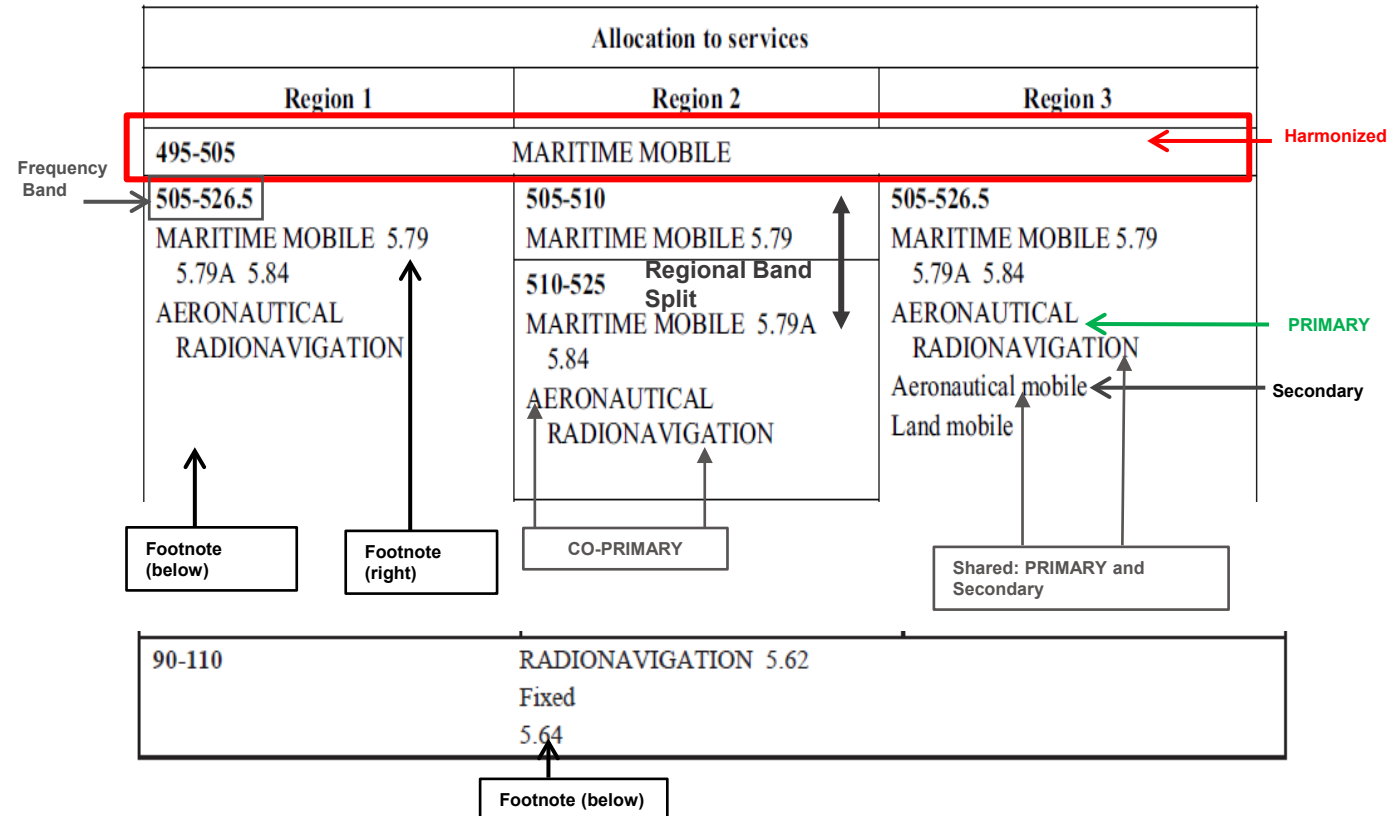
NOTE 1: "Band N" (N = band number) extends from 0.3×10^N Hz to 3×10^N Hz.

NOTE 2: Prefix: k = kilo (10^3), M = mega (10^6), G = giga (10^9).

RR: WORLD REGIONS



RR: TABLE OF FREQUENCY ALLOCATIONS (Art. 5)



RR: COUNTRY(ies) FOOTNOTES

(Examples*)

<p>137-137.025</p>	<p>SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208</p>	<p>FIXED MOBILE</p>	<p><u>Different Category of Service:</u> Same Services but Different Categories</p>
<p>137-137.025</p>	<p>SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208</p>	<p>+ BROADCASTING</p>	<p><u>Additional Allocation:</u> Same Services + More Services</p>
<p>137-137.025</p>	<p>SPACE OPERATION (space-to-Earth) METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208</p>	<p>FIXED MOBILE BROADCASTING</p>	<p><u>ALTERNATIVE Allocation:</u> Replaces the allocations indicated in the Table</p>

* No actual footnotes, for illustrative purpose only

Countries Footnotes format

Footnote shall indicate:

- Area or countries
- Frequency range (could be all or a part of concerned band)
- Type of allocation change (different category; additional; alternative)
- Services to modify
- Restriction?

Case 1: no restriction

5.88 Additional allocation: in China, the band 526.5-535 kHz is also allocated to the aeronautical radionavigation service on a secondary basis.

Case 2: with restriction

5.190 Additional allocation: in Monaco, the band 87.5-88 MHz is also allocated to the land mobile service on a primary basis, subject to agreement obtained under No. 9.21.*

Footnotes Restriction

Sub-Section IIA – Requirement and request for coordination

9.6 Before an administration notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. 9.27:

.....

9.21 p) for any station of a service for which the requirement to seek the agreement of other administrations is included in a footnote to the Table of Frequency Allocations referring to this provision.

Bands Harmonization

- NOT HARMONIZED ALLOCATION:

1. **Different Services by Region:** not global scale for terminals; harder border coordination (Regions edges)
2. **Several Primary Services:** countries might adopt different primary services, harder border coordination intra RR Region
3. **Primary and Secondary Services:** countries might allocate services on a different basis onto his territory; international coordination becomes more complex
4. **National Footnotes:** national exemptions, with all the above inconvenient

Bands Harmonization

- Harmonized utilization of spectrum by different nations is an essential need to support international roaming, to facilitate interconnection and to provide more economical radiocommunication services,
- Frequency bands can be utilized at same point, in same time, almost once while there could be more than one demand for utilization,
- Uncoordinated electromagnetic radiation of individual and independent spectrum users increase interferences matters
- **Global Harmonization:** Ultimate goal (as possible); RR Recommendation 34: *recommends that future world radiocommunication conferences:*
 - 2. Should, wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits) taking into account safety, technical, operational, economic and other relevant factors;
 - 3. Should, wherever possible, keep the number of footnotes in Article 5 to a minimum when allocating frequency bands through footnotes, in line with the Resolution 26

ITU-R Rules of Procedure

- The Rules of Procedure complement the Radio Regulations (RR) by providing clarification of the application of particular Regulations or establishing the necessary practical procedures that may not be provided for in the current Regulatory Provisions.
- RoP are revised at RRB meetings
- RoP are free of charge and are available at:
- <https://www.itu.int/pub/R-REG-ROP/en>



RR : Rules of Procedure, RoP

The Rules of Procedure (RoP) complement the Radio Regulations (RR) by providing clarification of the application of particular Regulations or establishing the necessary practical procedures that may not be provided for in the current Regulatory Provisions.

Example:

- **In appliace of provision 4.5 (RR)**

4.5 The frequency assigned to a station of a given service shall be separated from the limits of the band allocated to this service in such a way that, taking account of the frequency band assigned to a station, no harmful interference is caused to services to which frequency bands immediately adjoining are allocated.

- **it st**

4.5

1 The application of this provision involves the case of an adjacent band not allocated to the service concerned as well as the case of an adjacent band allocated to the service concerned with a different category of allocation.

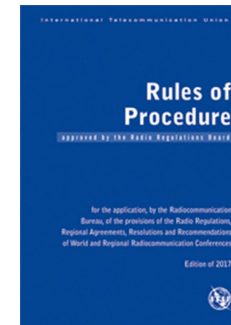
1.1 A frequency assignment, of which the assigned frequency band overlaps a band not allocated to the service concerned, shall receive an unfavourable regulatory finding under No. 11.31.

1.2 A frequency assignment, of which the assigned frequency band overlaps a band allocated with a lower category of service will be considered as having the lower category of service and, when recorded, will bear a symbol to this effect. (See Symbols R and S in Table 13B, Column 13B2, of the Preface to the IFL.)

2 To resolve cases of harmful interference between services in adjacent bands it was decided that, irrespective of the phenomena at the origin of the interference (out-of-band emission, intermodulation products, etc.), the administration responsible for the emission overlapping a non-allocated band shall use appropriate means to eliminate the interference.



re (RoP)



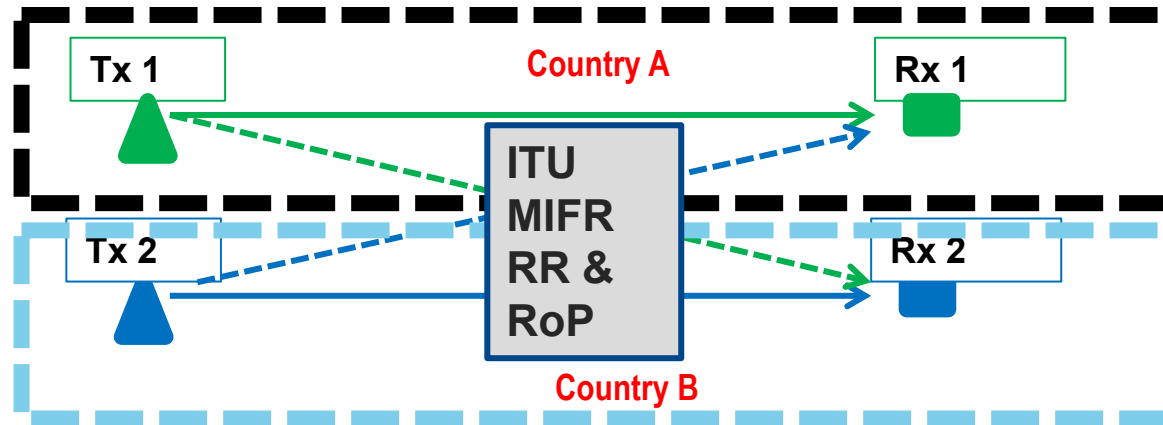
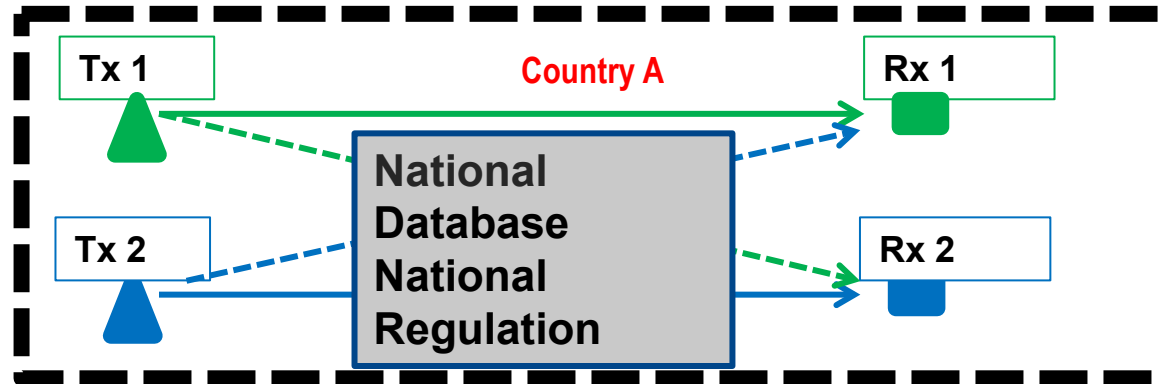
LICENSES

- **RR, Art 18: Licenses**
- **RR, No. 18.1:** No transmitting station may be established or operated by a private person or by any enterprise without a licence issued in an appropriate form and in conformity with the provisions of **these Regulations** by or on behalf of the government of the country to which the station in question is subject (however, see Nos. 18.2, 18.8 and 18.11).
- **Central provision of the RR:** enables recognition of spectrum uses and their protection against harmful interference, at national and international level.
 - The international recognition requires the entry into the MIFR.

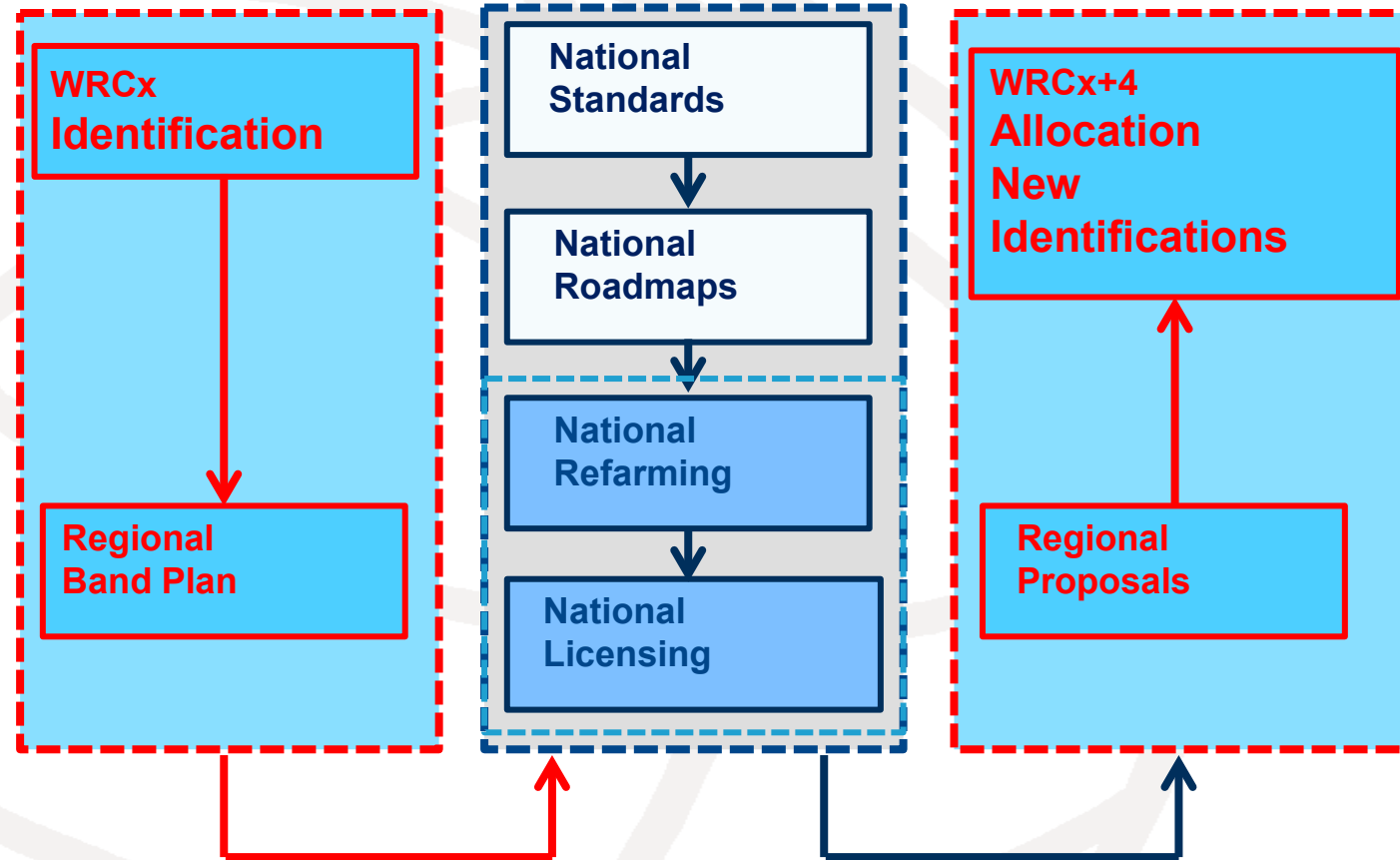
STATIONS REGISTRATION

- Stations protection cannot be “in abstract”
- Stations shall be duly registered, with their technical parameters, and other issues:
 - Nationally: National Spectrum Users Database
 - Internationally: ITU Master Innal. Frequency Register, MIFR
- Interference situations need to be objectively analyzed, and measured
 - - Nationally: Application of Spectrum National Rules
 - Internationally: Application of provisions on RR and RoP
- Regulatory actions to prevent/cease Interference situations can only be conducted if alleged affected stations are duly registered (Stations protection cannot be “in abstract”)

STATIONS COORDINATION



Spectrum Harmonization



RR and Spectrum Management Layers

	National	International
Legal Framework	National Spectrum Laws	ITU Radio Regulations, RR
1. Planing	National table of Frequency Allocations, NFAT	International Table of Frequency Allocations, ITFA (RR, Art. 5)
2. Licensing	National Spectrun Users Database	Master International Frequency Register, MIFR (RR, Art. 8)
3.a. Monitoring	National Monitoring System	International Monitoring System (RR, Art. 16)
3.b. Enforcement	National Regulators	ITU Radiocommunications Bureaux, BR
	National Courts	ITU Radio Regulations Board, RRB

Every SM Layer has both a National and International facet
 Every national Layer shall be consistent with the its International pair
ITU has not legal tools to force compliance of RRB decisions...

Thank you!

ITU – Radiocommunication Bureau

Questions to:

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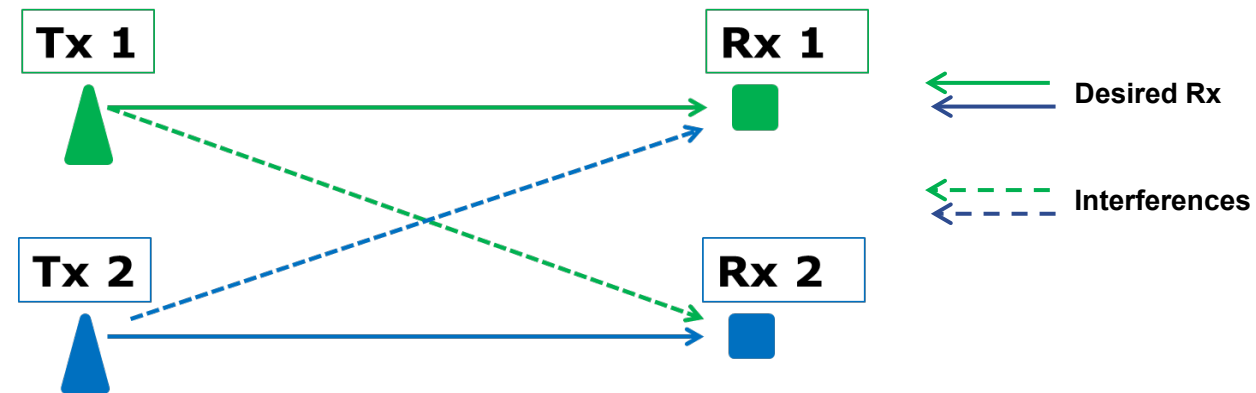
brmail@itu.int

RR: CLASSES OF INTERFERENCES

- **RR, No. 1.167 permissible interference:** Observed or **predicted** interference which **complies** with quantitative interference and sharing criteria contained in these **Regulations or in ITU-R Recommendations** or in special agreements as provided for in these Regulations.
- **RR, No. 1.168 accepted interference:** Interference at a higher level than that defined as permissible interference and which has been **agreed upon** between two or more **administrations** without prejudice to other administrations.
- **RR, No. 1.169 harmful interference:** Interference which **endangers** the functioning of a radionavigation service or of other safety services or seriously **degrades, obstructs, or repeatedly interrupts** a radiocommunication service operating in accordance with Radio Regulations (CS).
- In Spectrum Management and Regulation, the use of the expression: “Interference” refers by default to “harmful interference”

RR: INTERFERENCES

- **RR, No. 1.166 interference:** *The effect of unwanted energy due to one or a combination of emissions, radiations, or inductions upon reception in a radiocommunication system, manifested by any performance degradation, misinterpretation, or loss of information which could be extracted in the absence of such unwanted energy.*



A Rx may face many interferences sources: **intra-band** (same or other services); **adjacent bands/services**; permanent and intermittent; fixed or mobile source; **unintentional and intentional**; **current and futures**, etc.

“Unlicensed Devices”

- Expressions: “*unlicensed*”, “*license exempt*”, “*blanket licenses*” etc., refer to radio devices with transmitting capabilities (emitting radio waves) that can be operated by any person, without obtaining previously a particular authorization for it (no particular assignment/license).
- This waiving is possible because the operation of such “*unlicensed devices*” has been authorized to all public through a Generic Authorization, (also named General License, Blanket License, etc.) that includes the set of technical and operational specifications to be strictly obeyed when operating such devices, in order to guarantee their use without interfering to other services or similar devices.
- Every “*unlicensed device*” shall be pre set-up to obey its ruling specifications, enabling to operate without adjustments performed by its final user; they are commonly labeled as “*X compliant*” to indicate to buyers its alignment with concerned ruling.
- The expression “unlicensed” shall not be misinterpreted as permission to operating these devices in a free will fashion; its operation must strictly observe its ruling. Any alteration to exceed authorized pre setup parameters is an infringement of that ruling.

“Unlicensed Devices”

- They shall share frequencies in a regime of “non-interference/non-protection basis”:
 - - With stations on allocated services (primary or secondary; present or future)
 - other similar devices (all of them with equally rights, i.e., none of them having any priority)
- Unlicensed devices DON'T operate on a secondary basis (no first come –first served protection)
- Without a limit to the amount of devices operating simultaneously in a same area, a minimum bandwidth cannot be guaranteed (hence, neither QoS)
- As they are not protected and shall not interfere, they are not registered on Spectrum Users Databases: National, or International (MIFR)

Microsatellites

They are space stations, and subject to international regulations

Radiocommunication space station:

Subject to the provisions of the **ITU Radio Regulations**

Object thrown into space:

Subject to the provisions of the **Space Law Treaties of the Commission for the Peaceful Uses of Outer Space (COPUOS)**

The monitoring of these standards allows these projects, and the states involved, their harmonious operation without causing, or being affected by, risks to other existing systems.