

Radio Regulations

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Radio Regulations (RR)

- 1. RR: Organization and Main concepts**
- 2. International Table of Frequency Allocations (ITFA)**
- 3. Master International Frequency Register, MIFR, and BR IFIC**
- 4. RR and National Spectrum Management**

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RADIO REGULATIONS, RR

Spectrum cannot be limited to a given territory, international coordination is necessary: role of **ITU Radio Regulations (RR)**, an International Treaty, revised during World Radio Conferences (WRC) by Administrations and Membership.

RR has a binding nature for ITU Member states. ITU acts as its depositary

Last version: RR-12 (as revised during WRC-12)

VOLUME 1: Articles (59)

VOLUME 2: Appendices (22)

VOLUME 3: Resolutions (151) and
Recommendations (24)

VOLUME 4: ITU-R Recommendations
incorporated by reference (39)

MAPS: Set of Maps for App. 27





RADIO REGULATIONS: KEY DEFINITIONS

RR, No. 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, No. 1.5 Radio waves or hertzian waves: Electromagnetic waves of frequencies arbitrarily lower than 3000 GHz, propagated in space without artificial guide

RR, No. 1.19 Radiocommunication service: A service involving the transmission, emission and/or reception of radio waves for specific telecommunication purposes
(In RR, unless otherwise stated, any radiocommunication service relates to terrestrial)

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

RR defines 41 radio services and 53 radio stations and systems

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.*

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 term: “Interference” is commonly used to refer to “harmful interference”

RR: FREQUENCY MANAGEMENT (Sect. II)

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, No. 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.

* This Table is usually called: International Table of Frequency Allocations ITFA, in reference to its national counterpart: National Table of Frequency Allocations, NTFA



RR: FREQUENCY MANAGEMENT

Allocations are granted to Radiocommunications **Services**
Assignments are granted to Radiocommunications **Stations**

RR is technologically neutral: frequency bands are allocated to radiocommunication services, not to specific applications and/or technologies.

In general RR does not deal with Assignments*, as these fall within the sovereignty and autonomy of Administrations.

However, national Station Assignments shall be consistent with its NTFA and also the **RR (No. 4.4)** e.g.: assignment of a TV Station, only into a band allocated to Broadcasting Services.

* Due to their inherent international coverage nature, some services in some bands need that their allotment be also accompanied by an international assignment of their associated stations (so called: Planned Bands, contained on **RR Vol. 2: Appendices**)

NOTE: Most of dictionaries describe the expressions “**Allocation**” and “**Assignment**” as being **synonymous**; in the context of Spectrum Management and Regulation they have **different meanings**.

CATEGORY OF SERVICES

Category of Services (basis) might be in a:

- a) **PRIMARY** basis (capital letters*, **RR No. 5.25**); e.g.: FIXED
- b) **Secondary** basis (normal letters*, **RR No. 5.26**); e.g.: Fixed

RR, No. 5.28 Stations of a secondary service:

RR, No. 5.29 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;

RR, No.30 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;

RR, No. 5.31 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

(1st in time, 1st in right)

* In Arabic and Chinese versions, allocations in a primary basis are indicated by bold characters, e.g.:

- | | | |
|--------------|---------------------|--------------|
| • PRIMARY: | متنقلة بحرية | 无线电定位 |
| • Secondary: | متنقلة بحرية | 无线电定位 |

The Radio Regulations are supplemented by its Rules of Procedure (RoP), clarifying the application of particular rules or establishing the necessary practical procedures that may not be stipulated in current regulations.

RoP stem from an extensive review and revision of the Rules of Procedure of the Board of the Radio Regulations, taking into account the decisions of the WRC.

RoP are revised at every RRB meeting



Example RR & RoP binding ties

In appliance of provision 1.23 (RR)

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.

it shall be followed the associated procedure (RoP)

1.23

1 Number **1.23** states that the functions of the space operation service (space tracking, space telemetry, space telecommand) will normally be provided within the service in which the space station is operating. The question thus arises as to the appropriateness of considering frequency assignment notices with classes of stations performing these functions, to be in conformity with the Table of Frequency Allocations when the Table does not contain an allocation to the space operation service.

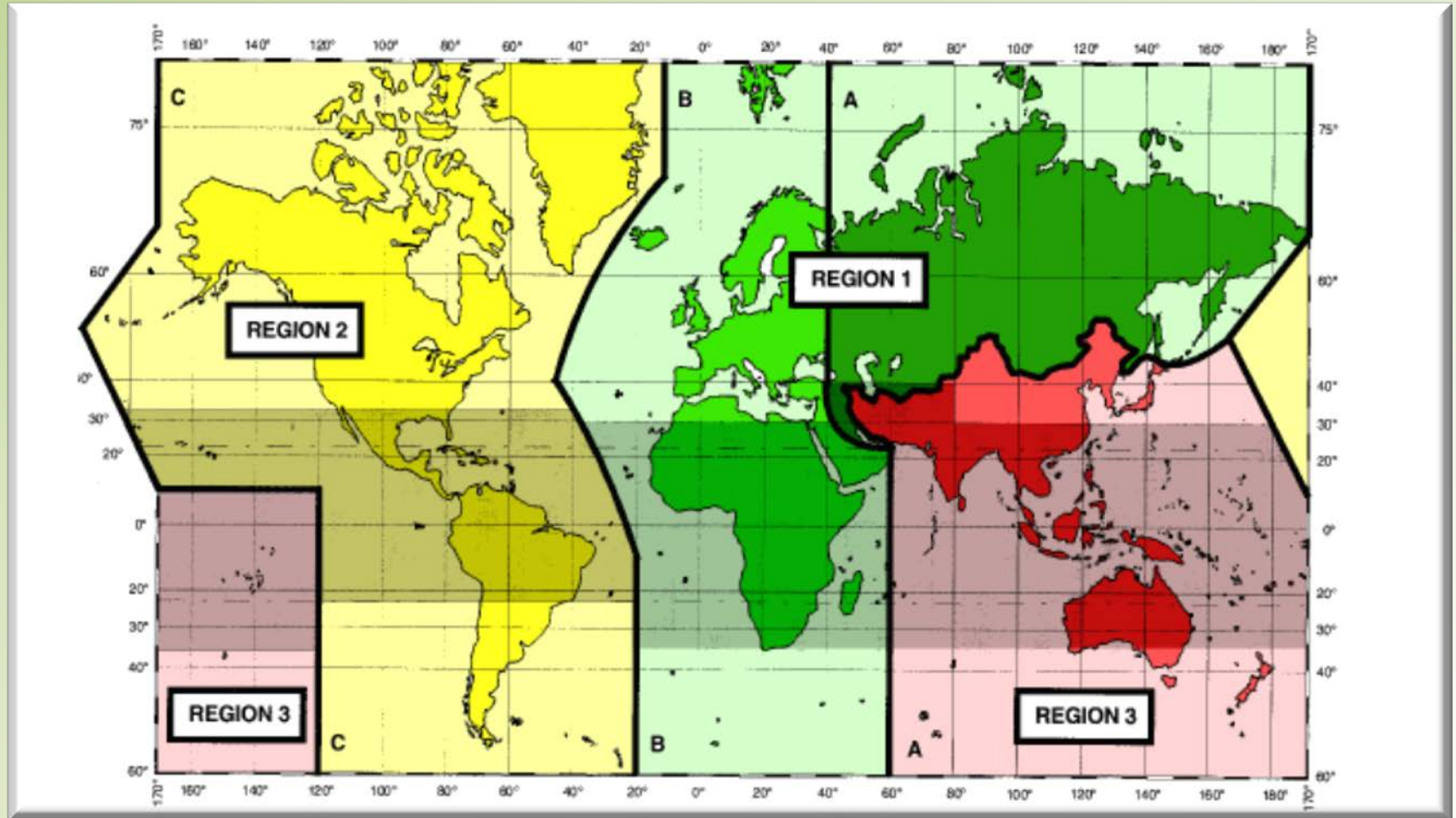




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RR REGIONS



Example: except from RR, Art. 5:

Allocation to services			
Region 1	Region 2	Region 3	
495-505	MARITIME MOBILE		← Harmonized
505-526.5	505-510	505-526.5	
MARITIME MOBILE 5.79	MARITIME MOBILE 5.79	MARITIME MOBILE 5.79	
5.79A 5.84	510-525 Regional Band Split	5.79A 5.84	
AERONAUTICAL	MARITIME MOBILE 5.79A	AERONAUTICAL	← PRIMARY
RADIONAVIGATION	5.84	RADIONAVIGATION	
	AERONAUTICAL	Aeronautical mobile	← Secondary
	RADIONAVIGATION	Land mobile	
Footnote (below)	Shared: CO-PRIMARY	Shared: PRIMARY and Secondary	

Services in a same basis are listed in alphabetical order (French); it does not indicate any relative priority (RR, No. 5.48)
 Footnotes below apply to several services or all allocation; footnotes at right apply to that particular service only
(RR No 5.50 & 5.5.1)

National Table of Frequency Allocations (NTFA) shall be in consistent with RR, (but not necessary equal to).

Main considerations:

1. Less services than Art. 5
2. Different basis than Art. 5
3. More services than in Art. 5
4. Different services than Art. 5



RR, Art. 5 Footnotes

1. Less services than RR, Art. 5 List:

Country 1
FIXED
Radionavigation

RR
FIXED BROADCASTING
Mobile Radionavigation

Country 2
BROADCASTING Mobile

ITFA Bands Slides not necessary match to NTFA ones (and its RR footnotes)

Countries 1 & 2 could have into their NTFA less services than the list on the ITFA on **RR Art. 5** (preserving their basis). Some countries do not make Footnote, but it is desirable for Innal. Spectrum Management matters.

2. Different basis than RR, Art. 5 List (*Different Category of Services*, **RR No. 5.32 & 5.33**):

Country 1
FIXED
Broadcasting Radionavigation

RR
FIXED BROADCASTING
Mobile Radionavigation

Country 2
MOBILE BROADCASTING

Countries 1 & 2 shall indicate their different basis allocations through respective footnotes, by the expressions: “*In country(ies)...the allocation of the Band(s)... is(are) on a secondary(primary) basis*”. International coordination matters, shall consider the full ITFA and involved footnotes; e.g.:

RR, 5.78 Different category of service: in Cuba, the United States of America and Mexico, the allocation of the band 415-435 kHz to the aeronautical radionavigation service is on a primary basis; (Band: 415-472 kHz)

Art. 5 Footnotes

3. More services than RR Art. 5 List (Additional allocations, RR No. 5.34 to 5.37):

Country 1	RR	Country 2
FIXED	FIXED	BROADCASTING
SPACE RESEARCH	BROADCASTING	
Radionavigation	Mobile	Mobile
	Radionavigation	Amateur

Country 1 & 2 shall indicate their additional allocations through respective footnotes, by the expressions: “*In country(ies).. the Band(s)...is(are) also allocated to...*”, and signaling the basis. International coordination matters, shall consider the full Art. 5 List and involved footnotes; e.g.:

RR, 5.74 Additional Allocation: in Region 1, the frequency band 285.3-285.7 kHz is also allocated to the maritime radionavigation service (other than radiobeacons) on a primary basis

4. Different services than RR, Art. 5 List (Alternative allocations, RR No. 5.38 to 5.41):

Country 1	RR	Country 2
	FIXED	BROADCASTING
SPACE RESEARCH	BROADCASTING	
Radionavigation	Mobile	
	Radionavigation	Amateur

Country 1 & 2 shall indicate their alternative allocations through respective footnotes, by the expression: “*In country(ies).. the Band(s).. is(are) allocated to...*”, and signaling the basis. International coordination matters shall consider the full Art. 5 List and involved footnotes; e.g.:

RR, 5.68 Alternative allocation: in Angola, Congo (Rep. of the), the Dem. Rep. of the Congo and South Africa, the band 160-200 kHz is allocated to the fixed service on a primary basis. (WRC-12)

Bands Harmonization

NOT HARMONIZED ALLOCATION:

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

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 (Rev.WRC-07)

RADIO REGULATIONS

Other concepts: although not explicitly defined, on the RR when dealing with band allocations (Art. 5), the use of the expressions (in footnotes): “*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
- ✓ **RR, No. 5.516B:** Bands identified for use by high-density applications in the fixed-satellite service
- ✓ **RR, Nos. 5.286AA, 5.313.A, 5.317A, 5.3: 84A, 5.388, 5.430A. 5432A, 5.432B, 5.433A:** 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*”.



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Any Station shall : a) not interfere other stations; a) be protected against interferences. Items a) & b) on the conditions stipulated on its license.

This protection/duties means a public “recognition”, acquired by its license, and preserved by its register on Spectrum use databases (nationally, and internationally when required)

RR, Art 18: Licenses: 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

Central provision of the RR: enables recognition of spectrum uses and their protection against harmful interference, at national and international level.

Stations protection cannot be “in abstract”: they shall be duly registered, with all 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

MIFR provisions (RR Art. 8)

RR, No.8.1.: International rights and obligations of administrations in respect to frequency assignments shall be derived from the recording of those in the Master International Frequency Register (Master Register) or from their conformity, where appropriate, with a plan *

RR, No. 8.3. : Frequency assignments recorded in the Master Register with a favourable finding have the right to international recognition

RR, No. 8.4 : A frequency assignment shall be known as a non-conforming assignment when it is not in accordance with the Table of Frequency Allocations or the other provisions of these Regulations.

RR, No. 8.5: If harmful interference to the reception of any station whose assignment is in accordance with No. 11.31 is actually caused by the use of a frequency assignment which is not in conformity with No. 11.31, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference

*Not all Stations need to be notified/registered on MIFR

The BR International Frequency Information Circular (**BR IFIC**) is intended to provide information on the frequency assignments/allotments submitted by administrations to the BR for recording in the Master International Frequency Register (MIFR) and Plans.

The BR IFIC is published once every two weeks by the BR (**RR, Nos. 20.1 to 20.6 and 20.15**). The BR IFIC is issued in the 6 UN languages: Arabic, Chinese, English, French, Russian and Spanish.

Due to the large volume of data, the BR IFIC is published in two parts: Terrestrial Services and Space Services. BR IFIC web sites:

- Terrestrial: <http://www.itu.int/en/ITU-R/terrestrial/brific/Pages/default.aspx>
- Space: <http://www.itu.int/en/ITU-R/space/Pages/brificMain.aspx>



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RR and Spectrum Management (SM)

Spectrum management is a combination of administrative and technical activities for efficient utilization of spectrum by users without causing harmful interference in their service area.

Main 3 layers:

1. **Planning:** Defining the use of different bands: Allocations to services
2. **Licensing:** Authorizing of emissions, and technical conditions: Assignments to Stations (Licences)
3. **Monitoring & Enforcement:** Verifying the use of spectrum in conformity with licensing conditions; preventive and corrective measures.

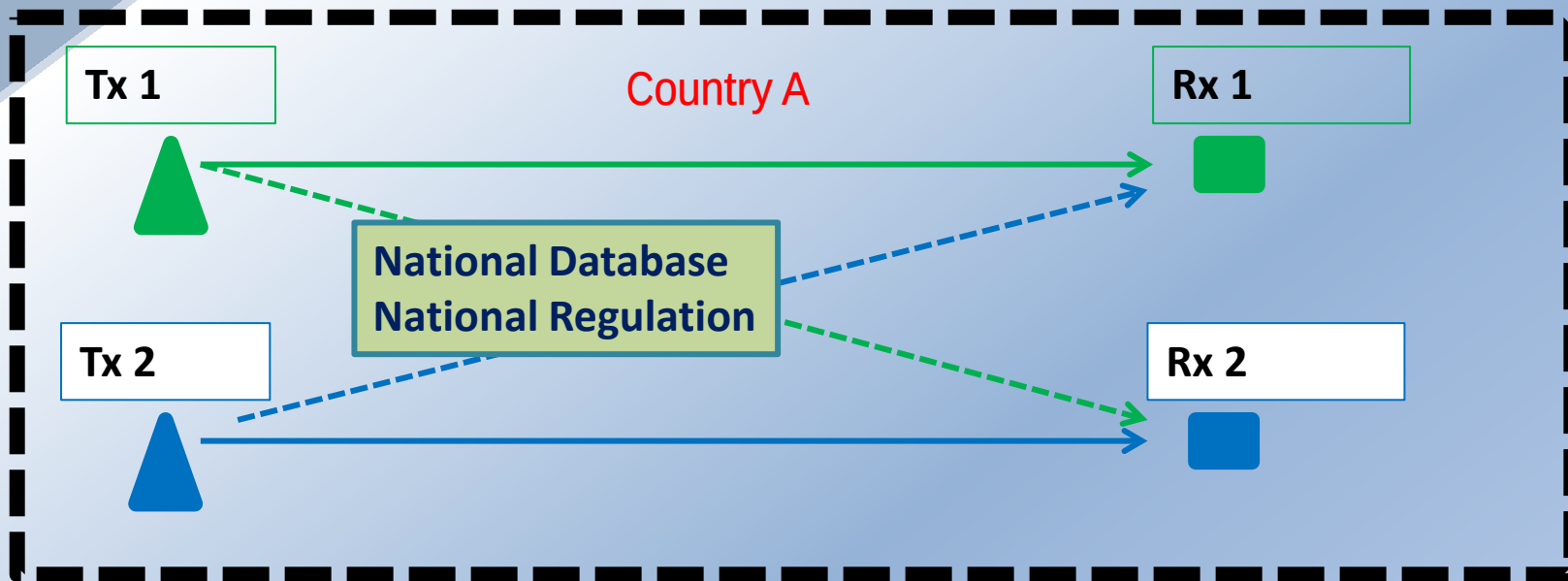
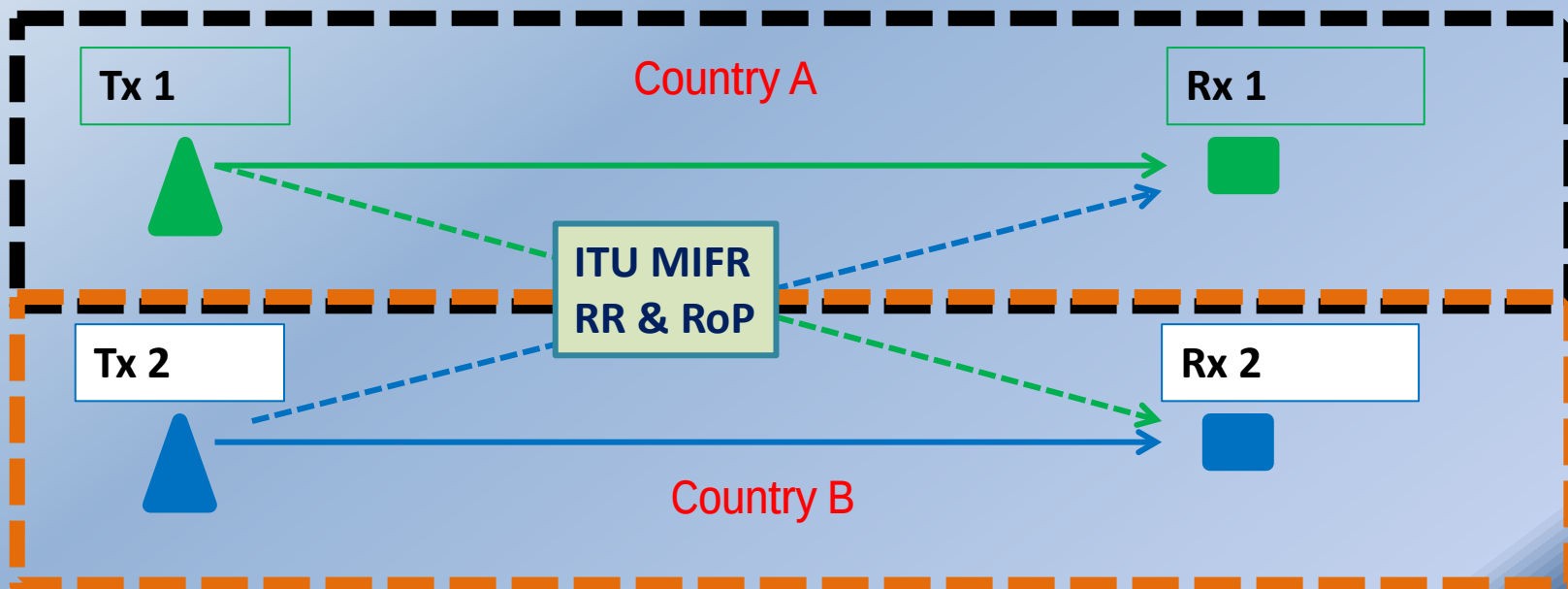
Spectrum cannot be confined to a given territory, then international matter shall be considered; furthermore, international harmonization entails many advantages for national management and spectrum users ecosystem.

RR and Spectrum Management Layers

	National	International
Legal Framework	National Spectrum Laws	ITU Radio Regulations, RR
1. Planing	National Table of Frequency Allocations, NTFA	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 Radiocommunication Bureau, 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

STATIONS COORDINATION



“Unlicensed Devices”

There is no “unlicensed operation” of any radio device/station.

To guarantee use of spectrum without interference, all services shall be previously allocated and all stations shall be assigned (obtaining a license) before entering into operation.

Expressions: “unlicensed”, “license exempt”, “blanket licenses” etc., refer to radio devices with transmitting capability (emitting radio waves) that can be operated by any person, without obtaining a particular authorization for it (particular license).

Particular licensing waiving is only possible whenever the operation of “unlicensed devices” has been previously authorized to all public through a Generic Use Authorization, GUA (also named General License, or equivalent names).

GUA always includes a set of detailed technical and operational specifications that must be strictly obeyed when operating such devices, in order to guarantee their use without causing interference to other similar devices or other services.

Manufacturers/vendors shall pre-setup devices with GUA technical specifications (*plug and play* style). Intentional alteration of these parameter is an infringement to GUA

Operation of these devices is under the principle of “no interference/no protection” to/from any allocated service (primary and/or secondary) and sharing frequencies with other similar devices, none of them having any priority



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Спасибо

謝

Merci

Thanks

Gracias



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