

ITUEvents

# ITU World Radiocommunication Seminar 2018

3-7 December 2018  
Geneva, Switzerland

[www.itu.int/go/ITU-R/WRS-18](http://www.itu.int/go/ITU-R/WRS-18)



**Harmful interference and  
infringements concerning  
terrestrial services**

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BR/TSD**

**ITU HQ Geneva,  
3 December, 2018**

# Use of the radio frequency spectrum

- Radio frequency spectrum  
8.3 kHz - 3 000 GHz
- Limited natural resource
- All countries have equal rights
- Some 40 radio services
- Various measures in CS and RR to prevent harmful interference

**8.3-110 kHz**

Allocation to services		
Region 1	Region 2	Region 3
Below 8.3	(Not allocated) 5.53 5.54	
8.3-9	METEOROLOGICAL AIDS 5.54A 5.54B 5.54C	
9-11.3	METEOROLOGICAL AIDS 5.54A RADIONAVIGATION	
11.3-14	RADIONAVIGATION	
14-19.95	FIXED MARITIME MOBILE 5.57 5.55 5.56	
19.95-20.05	STANDARD FREQUENCY AND TIME SIGNAL (20 kHz)	
20.05-70	FIXED MARITIME MOBILE 5.57 5.56 5.58	
70-72 RADIONAVIGATION 5.60	70-90 FIXED MARITIME MOBILE 5.57 MARITIME RADIO- NAVIGATION 5.60 Radiolocation	70-72 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59
72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60 5.56		72-84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60
84-86 RADIONAVIGATION 5.60		84-86 RADIONAVIGATION 5.60 Fixed Maritime mobile 5.57 5.59
86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.56	5.61	86-90 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.60
90-110	RADIONAVIGATION 5.62 Fixed 5.64	

# Definitions

## Permissible interference

Observed or predicted interference which complies with interference and sharing criteria

## Accepted interference

Interference at a higher level than permissible interference

## Harmful interference

Interference to radionavigation or safety services or seriously affect other services

# Measures against interference (CS)



## Role of the ITU

To allocate frequency bands, register assignments ... in order to avoid harmful interference (CS 11)

To coordinate efforts to eliminate harmful interference ...(CS 12)

## Role of ITU Members

To apply the CS, CV and RR in stations operated by them or authorized by them and which are capable of causing harmful interference (CS 37, 38, 197 and 198)

# Measures against interference (RR)



## Two main concepts

Frequency block allocations intended for use by defined services (Table of Frequency Allocations)

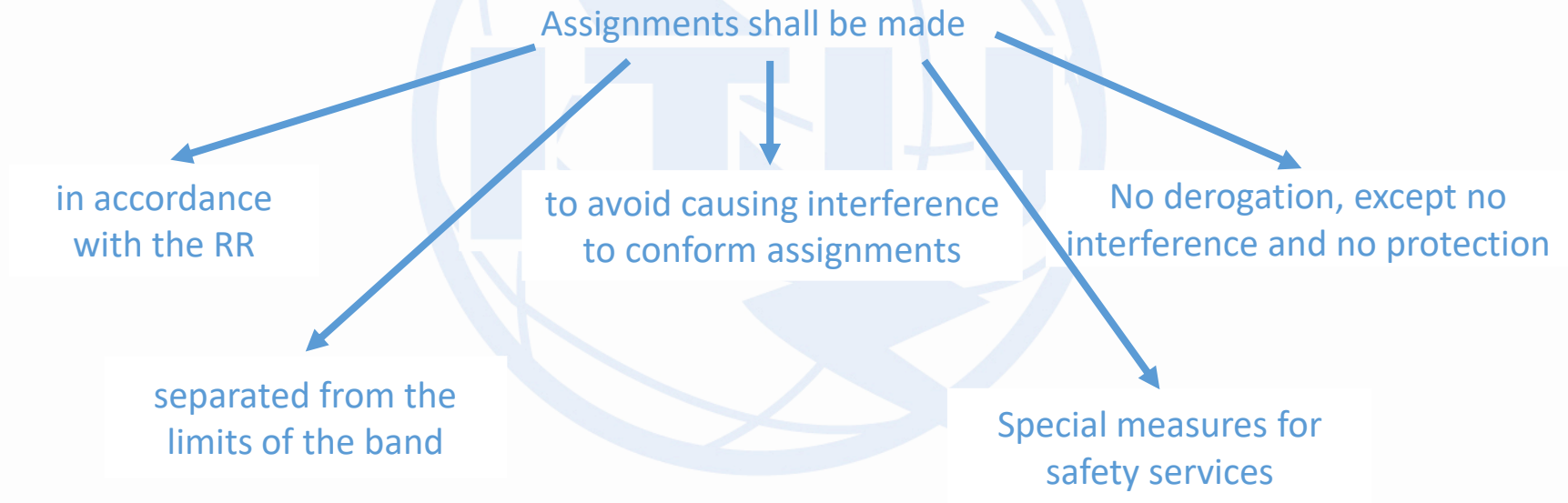
Supplemented by plans

Voluntary or obligatory regulatory procedures (Rules for assignments, international recognition, notification, etc. )

# Measures against interference (RR)



## General rules for assignments (Art. 4)



# Measures against interference (RR)



## Frequency allocations Table (Art. 5)

- Common frequency allocations to mutually compatible services
- Secondary service shall not cause harmful interference to primary services
- Secondary service shall not claim protection from primary services
- But can claim protection from the same or other secondary services

RR5-54

CHAPTER II – Frequencies

410-460 MHz		
Allocation to services		
Region 1	Region 2	Region 3
410-420	FIXED MOBILE except aeronautical mobile SPACE RESEARCH (space-to-space) 5.268	
420-430	FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271	
430-432 AMATEUR RADIOLOCATION 5.271 5.274 5.275 5.276 5.277	430-432 RADIOLOCATION Amateur 5.271 5.276 5.278 5.279	
432-438 AMATEUR RADIOLOCATION Earth exploration-satellite (active) 5.279A 5.138 5.271 5.276 5.277 5.280 5.281 5.282	432-438 RADIOLOCATION Amateur Earth exploration-satellite (active) 5.279A 5.271 5.276 5.278 5.279 5.281 5.282	
438-440 AMATEUR RADIOLOCATION 5.271 5.274 5.275 5.276 5.277 5.283	438-440 RADIOLOCATION Amateur 5.271 5.276 5.278 5.279	
440-450	FIXED MOBILE except aeronautical mobile Radiolocation 5.269 5.270 5.271 5.284 5.285 5.286	
450-455	FIXED MOBILE 5.286AA 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E	
455-456 FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B 5.286C 5.286E	455-456 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.209 5.286A 5.286B 5.286C	455-456 FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B 5.286C 5.286E
456-459	FIXED MOBILE 5.286AA 5.271 5.287 5.288	
459-460 FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.209 5.286A 5.286B 5.286C	459-460 FIXED MOBILE 5.286AA  5.209 5.271 5.286A 5.286B 5.286C 5.286E

# Measures against interference (RR)



## Status of assignments (Art. 8)



- Rights and obligations
- International recognition
- Assignments notified under No. 4.4
- Application of No. 8.5



# Measures against interference (RR)

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## Notification and recording of assignments (Art. 11)

Any assignment shall be notified :

- if capable of causing harmful interference
  - if used for international radiocommunication
  - if subject to the coordination procedure
  - to obtain international recognition
  - if an administration wishes to register a non-conforming assignment, for information
-

# Measures against interference (RR)

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## Interference from Radio Stations (Art. 15)

- Unnecessary transmissions
  - Transmitting stations limited to necessary power
  - Minimum radiation in unnecessary directions
  - No interference on distress and safety frequencies
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# Measures against interference (RR)

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## Licences (Art. 18)

No transmitting station may be established or operated ... without a licence issued ...in conformity with the RR by or on behalf of the government of the country to which the station in question is subject (18.1)

# Measures against interference (RR)

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## Broadcasting service (Art. 23)

Broadcasting stations using frequencies below 5 060 kHz (except 3 900-4 000 kHz) or above 41 MHz shall not employ power exceeding that necessary to maintain ... national service of good quality within the frontiers of the country concerned (23.3)

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# Procedure in a case of harmful interference



**Harmful  
interference  
complaint**

**Acknowledgement  
of receipt**

**BR**

Appendix 10 Report  
(identification and location  
of the source, frequency  
measured, date, time, class  
of emission, bandwidth,  
measured field strength or  
power flux-density, etc.)

Investigation  
Monitoring campaign  
Cooperation with the Administration  
concerned (Monitoring stations or  
Operators)  
Information about the actions taken

If necessary, inform the BR  
If bilateral action failed,  
request BR assistance  
International monitoring  
Radio Regulations Board

## Report of harmful interference

(See Article 15, Section VI)

*Particulars concerning the station causing the interference:*

*a* Name, call sign or other means of identification .....

*b* Frequency measured .....

Date: .....

Time (UTC): .....

*c* Class of emission<sup>1</sup> .....

*d* Bandwidth (indicate whether measured or estimated) .....

*e* Measured field strength or power flux-density<sup>2</sup> .....

Date: .....

Time (UTC): .....

*f* Observed polarization .....

*g* Class of station and nature of service .....

*h* Location/position/area/bearing (QTE<sup>3</sup>) (WRC-07) .....

*i* Location of the facility which made the above measurements .....

*Particulars concerning the transmitting station interfered with:*

*j* Name, call sign or other means of identification .....

*k* Frequency assigned .....

*l* Frequency measured .....

Date: .....

Time (UTC): .....

*m* Class of emission<sup>4</sup> .....

*n* Bandwidth (indicate whether measured or estimated, or indicate the necessary bandwidth notified to the Radiocommunication Bureau) .....

*o* Location/position/area .....

*p* Location of the facility which made the above measurements .....

*Particulars furnished by the receiving station experiencing the interference:*

*q* Name of station .....

*r* Location/position/area .....

*s* Dates and times (UTC) of occurrence of harmful interference .....

*t* Bearings (QTE<sup>5</sup>) or other particulars (WRC-07) .....

*u* Nature of interference .....

*v* Field strength or power flux-density of the wanted emission at the receiving station experiencing the interference<sup>6</sup> .....

Date: .....

Time (UTC): .....

*w* Polarization of the receiving antenna or observed polarization .....

*x* Action requested .....

NOTE – For convenience and brevity, telegraphic reports shall be in the format above, using the letters in the order listed in lieu of the explanatory titles, but only those letters for which information is provided should be used. However, sufficient information shall be provided to the administration receiving the report, so that an appropriate investigation can be conducted.

<sup>1</sup> The class of emission shall contain the basic characteristics listed in Appendix 1. If any characteristic cannot be determined, indicate the unknown symbol with a dash. However, if a station is not able to identify unambiguously whether the modulation is frequency or phase modulation, indicate frequency modulation (F).

<sup>2</sup> When measurements are not available, signal strengths according to the QSA scale should be provided.

<sup>3</sup> See the most recent version of Recommendation ITU-R M.1172. (WRC-07)

<sup>4</sup> See footnote 1.

<sup>5</sup> See footnote 3.

# Infringements of the CS, CV or RR

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- Appendix 9 Report to its administration
  - Inform the administration responsible of the station causing the infringement
  - Ascertain the facts and necessary actions
  - If the infringement persist, inform the BR
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**Report of an irregularity or infringement**

(See Article 15, Section V)

*Particulars concerning the station infringing the Radio Regulations:*

- 1 Name<sup>1</sup> if known (in BLOCK letters) .....
- 2 Call sign or other identification (in BLOCK letters) .....
- 3 Nationality, if known .....
- 4 Frequency used (kHz, MHz, GHz or THz) .....
- 5 Class of emission<sup>2</sup> .....
- 6 Class of station and nature of service, if known .....
- 7 Location<sup>3, 4, 5</sup> .....

*Particulars concerning the station, the centralizing office or inspection service reporting the irregularity or infringement.*

- 8 Name (in BLOCK letters) .....
- 9 Call sign or other identification (in BLOCK letters) .....
- 10 Nationality .....
- 11 Location<sup>3, 4</sup> .....

*Particulars of the irregularity or infringement.*

- 12 Name<sup>6</sup> of the station (in BLOCK letters) in communication with the station committing the irregularity or infringement .....
- 13 Call sign or other identification (in BLOCK letters) of the station in communication with the station committing the irregularity or infringement .....

- 14 Date and time<sup>7</sup> .....
- 15 Nature of the irregularity or infringement<sup>8</sup> .....
- 16 Extracts from ship log or other information supporting the report .....

*Particulars concerning the transmitting station interfered with<sup>9</sup>:*

- 17 Name of the station (in BLOCK letters) .....
- 18 Call sign or other identification (in BLOCK letters) .....
- 19 Frequency assigned (kHz, MHz, GHz or THz) .....
- 20 Frequency measured at the time of the interference .....
- 21 Class of emission<sup>2</sup> and bandwidth (indicate whether measured or estimated, or indicate the necessary bandwidth notified to the Radiocommunication Bureau) .....
- 22 Receiving location<sup>3, 4</sup> (in BLOCK letters) where the interference was experienced .....

23 Certificate:

I certify that the foregoing report represents, to the best of my knowledge, a complete and accurate account of what took place. ....

Signatures<sup>10</sup> ..... Date: .....



# Cases of Harmful interference

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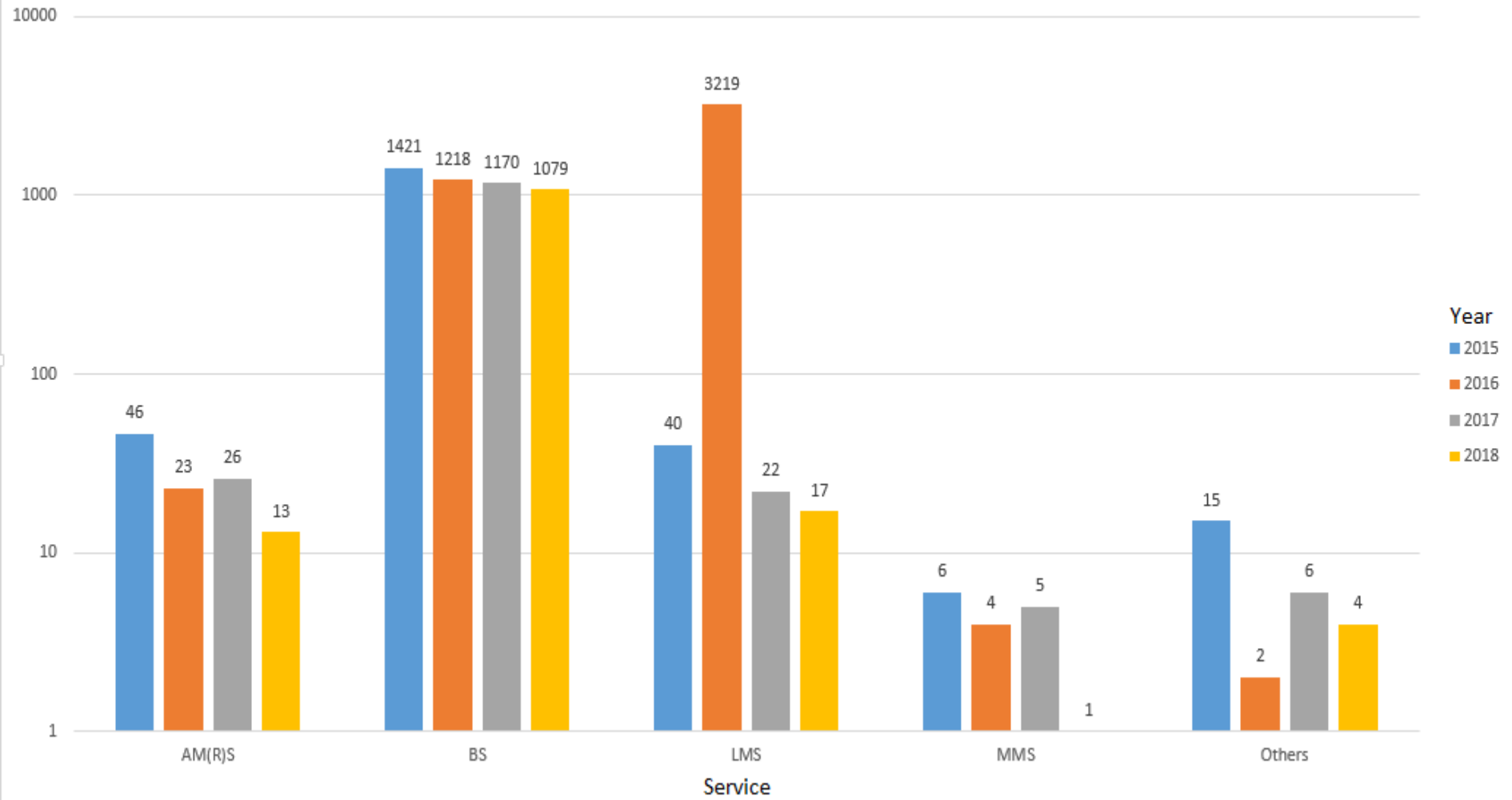
- Out of band operations
  - Operation of non-coordinated frequencies
  - Non-observance of limits of frequency tolerances or maximum permitted power levels for spurious emissions
  - Non-observance of limitation within the band allocated
  - Operating with different technical parameters
  - Unnecessary transmissions
  - Unauthorised emissions
-

# Harmful interference statistics

in 2018, 38 terrestrial services cases

- Request for assistance: 18
  - For BR information: 20
  - Safety services: 12
- > 1000 Appendix 10
- AM(R)S: 13
  - BS: 1079
  - LMS: 17
  - MMS: 1
  - FS: 2
  - Amateur: 2

## Total reports received



AM(R)S: Aeronautical mobile (route) service - BS: Broadcasting service - LMS: Land mobile service - MMS: Maritime mobile service

Number of reports per month

10000

1000

100

10

1

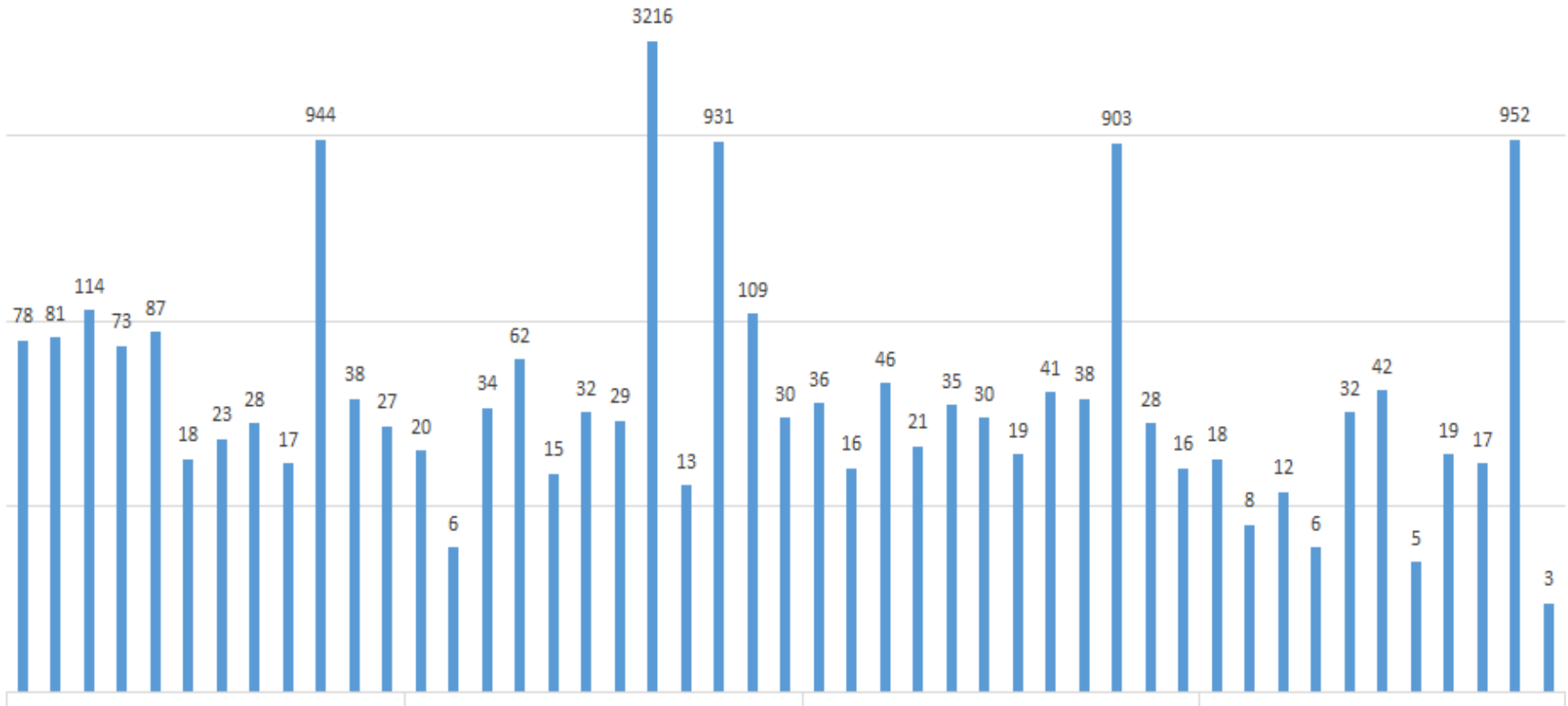
01 02 03 04 05 06 07 08 09 10 11 12 01 02 03 04 05 06 07 08 09 10 11 12 01 02 03 04 05 06 07 08 09 10 11 12 01 02 03 04 05 06 07 08 09 10 11

2015

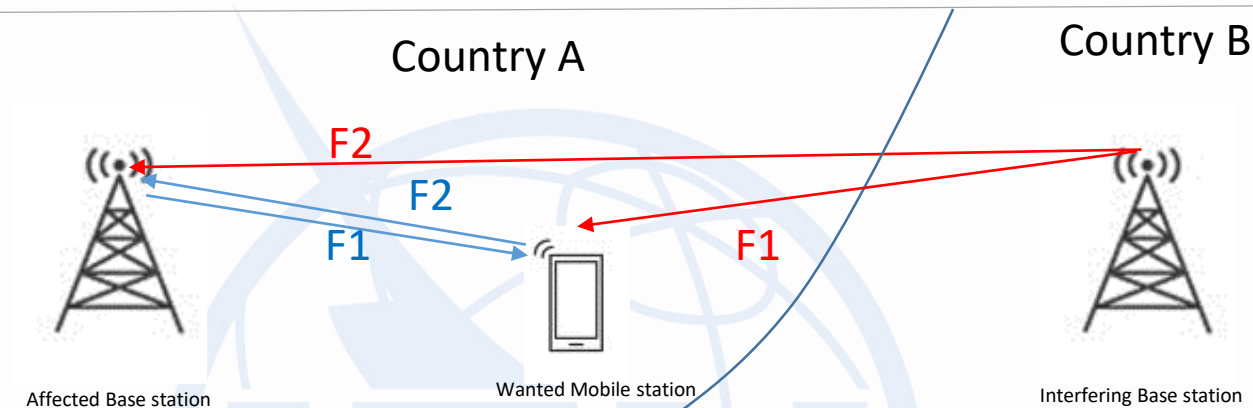
2016

2017

2018



# No coordination (e.g. Mobile stations interfered by mobile stations of a neighbouring country)

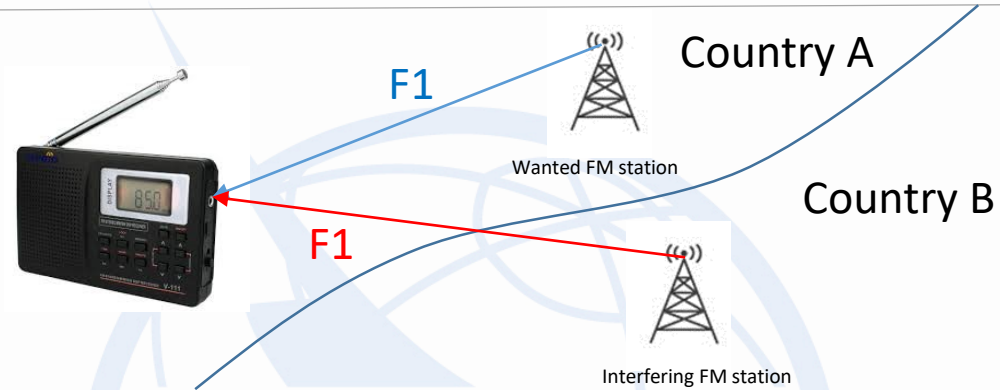


Assignments are recorded in the MIFR under No. 11.31 (Right to international recognition)

- If interference is caused by a non-conforming assignment to a conforming assignment, No. 8.5 applies
- If interference is caused by a conforming assignment to another conforming assignment, the matter is to be resolved between the administrations concerned



# No coordination (e.g. Interference to a station in the GE84 Plan and MIFR by a co-channel station not in the Plan)



Assignments to FM stations recorded in the MIFR with a favourable finding under No. 11.34 has right to international recognition

- If harmful interference is caused by assignment from Administration B party to the GE84 agreement, the case is to be dealt based on the status of the assignments
- If harmful interference is caused by assignment from Administration B not party to the GE84 agreement, the matter is to be resolved between the administrations



**FINAL ACTS**  
of the  
Regional Administrative Conference  
for the Planning  
of VHF Sound Broadcasting  
(Region 1 and part of Region 3)  
Geneva, 1984

# Final remarks

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- All stations must be established and operated in such a manner as not to cause harmful interference
  - Any assignment that could cause harmful interference shall be notified to the ITU
  - Spectrum monitoring is an essential component of a National Spectrum Management System
  - Radio waves do not stop at borders, it is necessary to coordinate with your neighbours
  - Coordination agreements including a procedure for resolving harmful interference
-



**Thank you**

**Please remember to visit  
the WRS-18 Exhibition  
located at the entrance of the  
ITU Montbrillant building**