Regulations, WRC 2015/2019:
Challenges and Opportunities ahead

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ITU

INVAP

Ministerio de Comunicaciones
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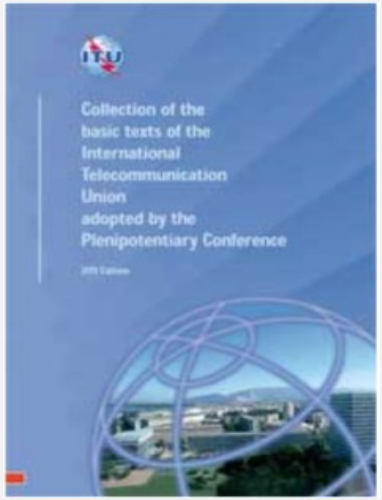
ITU RECOGNIZED AS UN SPECIALIZED AGENCY RESPONSIBLE FOR

- Principles of use of orbit/spectrum
- Allocation of frequency bands
- Procedures, Plans, operational measures
- Instruments (Constitution, Convention, Radio Regulations, Rules of Procedures, Recommendations)

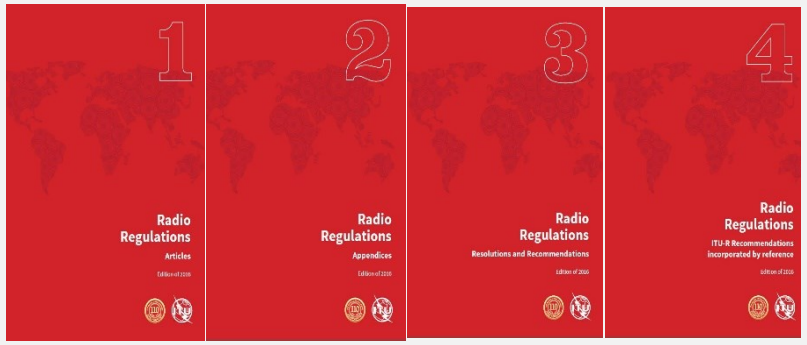


ITU Constitution
(Art.44)

Radio frequencies & satellite orbits are limited natural resources

Rational, Efficient, Economical Use

Equitable Access



TODAY

More than 2000 pages of Radio Regulations

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

RADIO REGULATIONS

- Updated every 4 years by World Radiocommunication Conference (WRC)
- Complemented by Rules of Procedure, revised by Radio Regulations Board (RRB)

1. Harmonize global spectrum to create economies of scale, roaming and interoperability

3. Creating certainty requires consensus: time, efforts and patience

WRC PURPOSE

2. Create regulatory certainty for a multi-trillion dollars industry playing an increasingly important role in the development of our societies

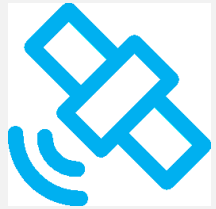
WRC-15 key achievements

- Providing spectrum for mobile broadband (IMT) on a global basis
- Making new allocations to the FSS, MMSS and EESS
- Improving the satellite frequency assignments regulatory procedures
- Authorizing frequency bands and establishing regulatory conditions for unmanned aircraft systems
- Providing required spectrum for WAIC as well as for automotive and maritime transports

Everybody in favor of spectrum harmonization but
Everybody wants it his own way

3400-3700 MHz
WRC-07: Use it or loose it!
3400-3600 MHz: Lost
3600-3700 MHz
WRC-15: Use it or loose it
WRC-??: Lost??
3700-3800 MHz ??

MOBILE BROADBAND VS SATELLITES



Allocations to mobile service and/or identifications for IMT in 3400-3700 MHz and 470-694/698, 694 – 790 (R1),1427-1518, 3300-3400, 4800 – 4990 MHz

Subject to conditions to secure protection of incumbent services e.g. non-interference basis, pfd limits, 9.21

Unmanned Aircraft Systems (UAS)

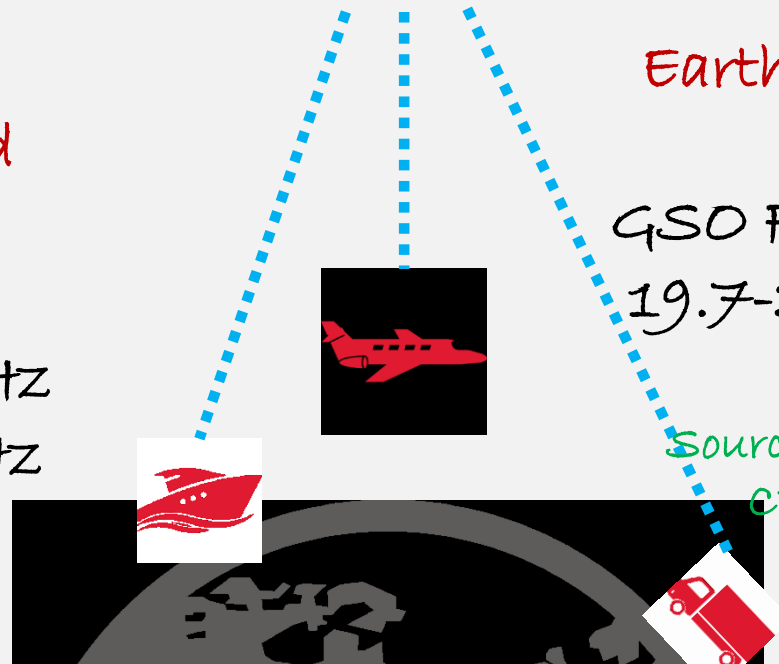
8 bands , Ku band: 970 MHz globally, 1520 MHz regionally, Ka band: 1000 MHz globally;
To be used only after development of ICAO aeronautical standards & recommended practices (SARPs);
...commercial used after 2023!!!

Source: CR/407 of 05.07.2016

FSS APPLICATIONS

Earth stations located on board vessels (ESVs)

FSS in
5925-6 425 MHz
and 14-14.5 GHz
smaller (1.2m)
antenna



Earth Stations in Motion (ESIM)

GSO FSS space stations in
19.7-20.2, 29.5-30.0 GHz
in all Regions

Source: CR/393 of 18.03.2016,
CR/403 of 05.07.2016

Typical Earth Stations

- WRC-15 concluded further ITU-R studies needed before any regulatory decision
- Administration can submit typical earth station, for information purposes
- Information to assist technical and regulatory studies - possible international recognition of millions of typical ES
- BR developed a web platform to submit and post information https://www.itu.int/net4/ITU-R/space/TypicalESinFSS

Source: **CR/389 of 29.01.2016, CR/404 23.05.2016**

Bringing into use of non-GSO FSS/MSS systems

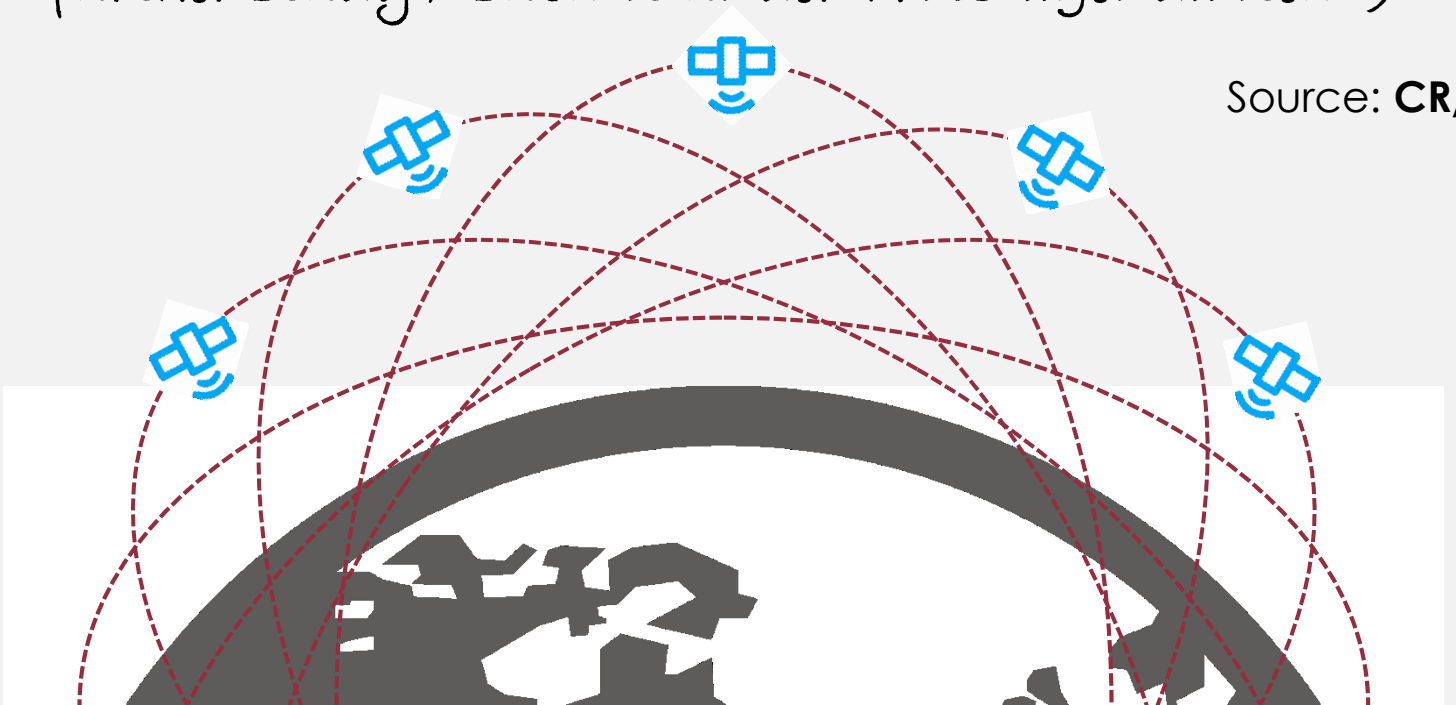
- ITU-R to examine under WRC agenda item 7 and develop possible additional milestones beyond RR Nos. 11.25 and 11.44
- To consider implications on non-GSO systems BIU after WRC-15

Source: **RRB-73 RoP on No. 11.44**

Coordination among non-GSO FSS systems

- Administrations may mutually agree on multilateral coordination meetings
- ITU-R can further study / submit under WRC agenda item 7

Source: **CR/389 of 29.01.2016**



Reference time scale :

current implementation of UTC to insert leap seconds to continue until WRC-23!

... and also

WRC 2019

Global Flight Tracking (GFT)

improves aircraft tracking through utilization of an existing technology; especially important for polar, oceanic, remote areas ; ARNS allocation in 1087.7-1092.3 MHz for satellite reception ADS-B messages

Source: CR/394 of 18.03.2016, CR/403 of 05.07.2016

Future broadband

Wireless access system (5 GHz), pico-femto- cells (24.25-86 GHz) IMT, HAPS, global NGSO FSS (>30 GHz) , identification in 275-450 GHz for land-mobile and fixed services

ESIM

Communicating with GSO FSS in 17.7-19.7 & 27.5-29.5 GHz

Safety of life

development of Global Aeronautical and Maritime distress and safety systems (GADSS and GDMSS)

Earth resources & Climate monitoring, Weather forecast,

Intelligent Transport System and unmanned transport

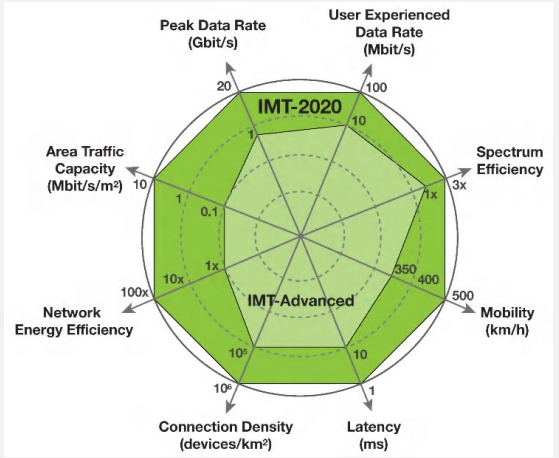
M2M for maritime, railway, road transport

Stations on board sub-orbital vehicles

Broadband applications in the MS (WRC-19 agenda items 1.13 and 1.16)

The following bands, which are already allocated to mobile, will be studied with a view to an IMT-2020 identification:

- 24.25 – 27.5 GHz
- 37 – 40.5 GHz
- 42.5 – 43.5 GHz
- 45.5 – 47 GHz
- 47.2 – 50.2 GHz
- 50.4 – 52.6 GHz
- 66 – 76 GHz
- 81 – 86 GHz



WRC 2019

… and also

The following bands will also be studied, although they do not currently have global mobile allocations:

- 31.8 – 33.4 GHz
- 40.5 – 42.5 GHz
- 47 - 47.2 GHz

Studies for considering appropriate regulatory actions for HAPS, within existing FS alloc. at 47.2-47.5, 47.9-48.2 & 31.0-31.3**/27.9-28.2** GHz (**outside Reg. 2, +5 ADMs @6.5/6.5 MHz) or study new bands: 38-39.5 GHz & 21.4-22 & 24.25-27.5 GHz

... and also

WRC 2019

Study spectrum needs for TT&C in the SOS for non-GSO satellites with short duration missions & consider, if necessary, new SOS allocations

Studies on development of a regulatory framework for non-GSO FSS systems that may operate in the bands 37.5-39.5 GHz (s-E), 39.5-42.5 GHz (s-E), 47.2-50.2 GHz (E-s) and 50.4-51.4 GHz (E-s)

How to provide international recognition to fixed earth stations and typical earth stations in C-band

Importance of C-band for FSS:

- High availability even in areas with severe rain fade e.g. Asia Pacific
- Wide satellite coverage - enables services to sparsely populated areas over large distances
- One satellite every second degree around GSO has C-band on-board

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3700-3800 MHz ??

TO NOTIFY THE EARTH STATIONS FOR RECORDING INTO THE MIFR

Circular Letter CR/404 of 23.05.2016

https://www.itu.int/net4/ITU-R/space/TypicalESinFSS/

"With a concerted effort, we can reduce, and to the extent possible remove, all obstacles impeding the development and bringing into operation of new satellite networks"

"Think carefully about how we can continue to use and improve satellite access to help connect the unconnected, and make the world a better and a fairer place for all"

MERCI

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