# LONDON INSTITUTE OF SPACE POLICY AND LAW

# SPACE POLICY AND LAW COURSE

ON-LINE
9 to 11 November 2020

## SPACE COMMUNICATION

Yvon Henri
RRB Member, ITU

# Challenges and opportunities for Satellite Spectrum/Orbit Access *(ITU and the International Regulatory Environment)*

Yvon Henri

RRB member, ITU

ISPL
London Institute of Space Policy and Law

*About ITU*

# Who is ITU?

*About ITU*

## Who is ITU?

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

committed to
**connecting all the world's people**

*Meet ITU*

# What ITU does

‘Committed to Connecting all the World’s people’

**3 Sectors**

**ITU Radiocommunication**

**Coordinating** and **assigning** radio-frequency spectrum and orbits for satellites

**ITU Standardization**

**Establishing** global standards

**ITU Development**

**Bridging** the digital divide

*Meet ITU*

# How ITU is governed


## Plenipotentiary Conference


## Council

## World Conference on Telecommunications

# How ITU is governed

## World/Regional Radiocommunication Conferences

Radiocommunication Assemblies

RRB

Advisory Group | Study Groups

ITU-R

## World Telecommunications Standardization Assemblies

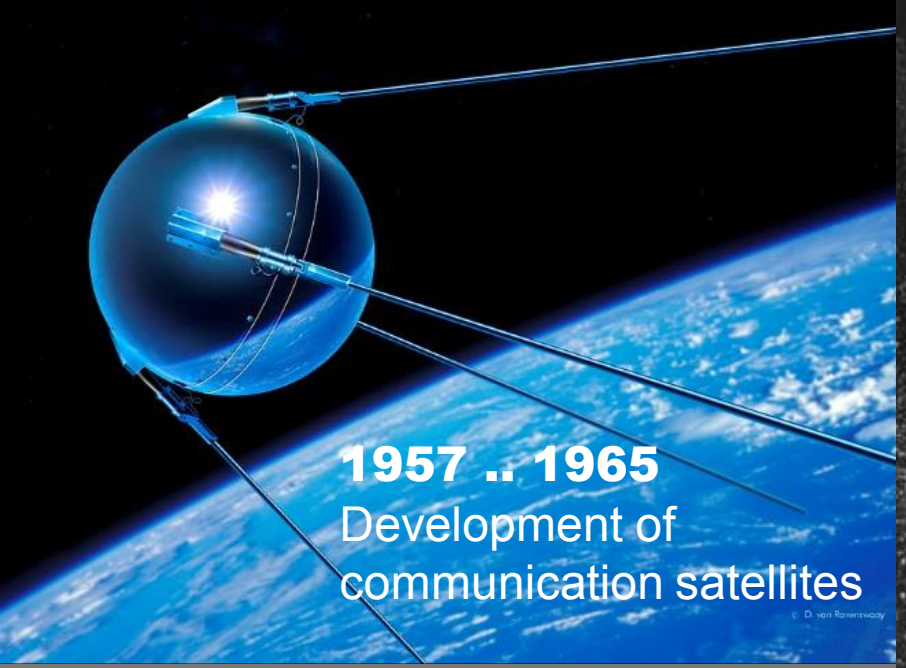
Advisory Group | Study Groups

ITU-T

## World Telecommunications Development Conferences

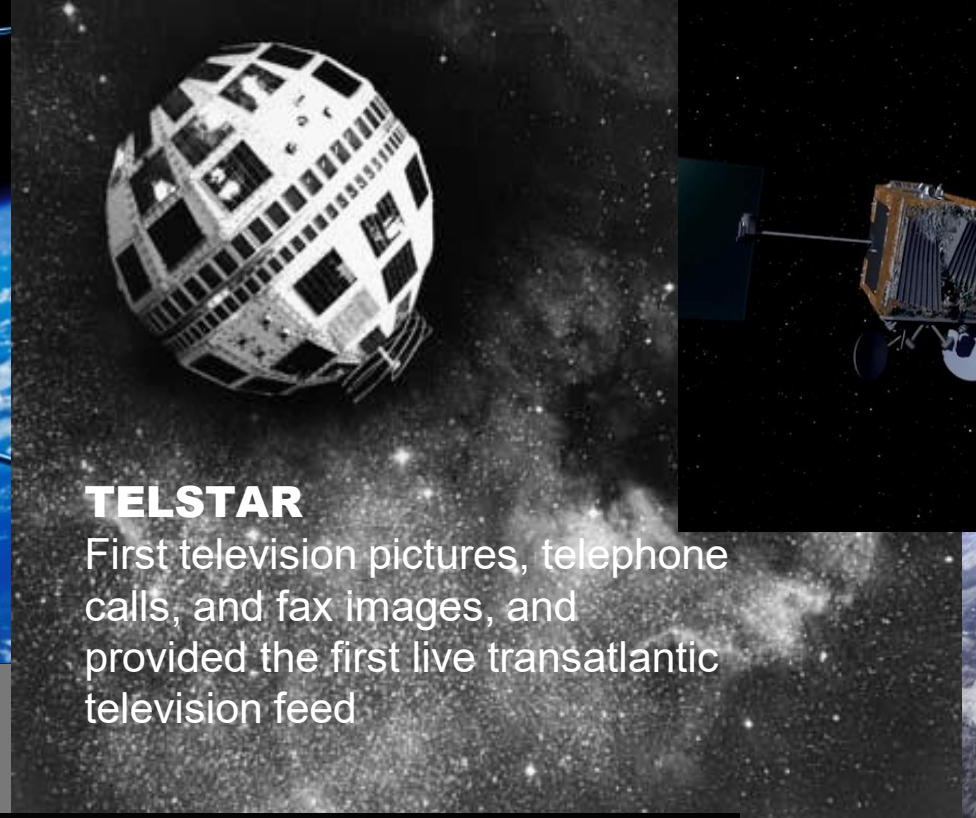
Advisory Group | Study Groups

ITU-D




**SPUTNIK 1** (Спу́тник-1)

First artificial Earth satellite launched on 4th October 1957 with external radio antennas to broadcast radio pulses



**TELSTAR**

First television pictures, telephone calls, and fax images, and provided the first live transatlantic television feed

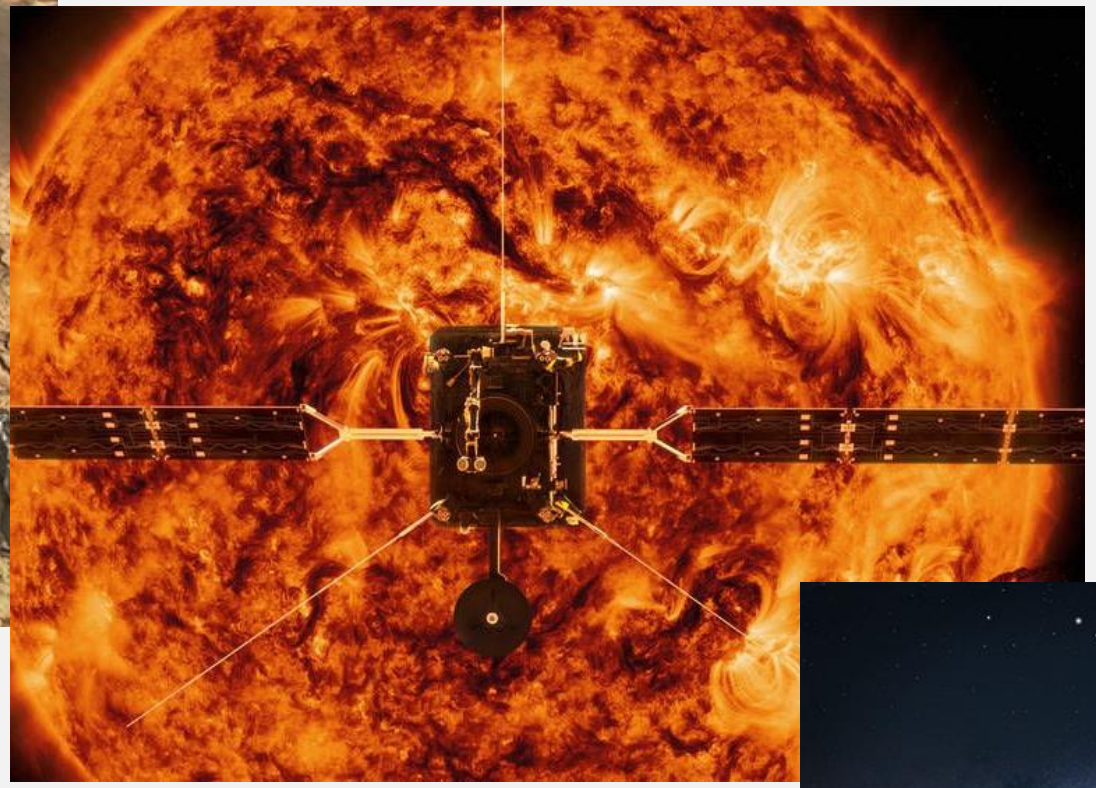







Launched on **30 July 2020** at 11:50 UTC and will touch down in Jezero crater on Mars on 18 February 2021.

**Solar Orbiter (SolO)**
closer approach at 0.3 AU* is expected in October 2022, and the first polar pass will happen in March 2025.

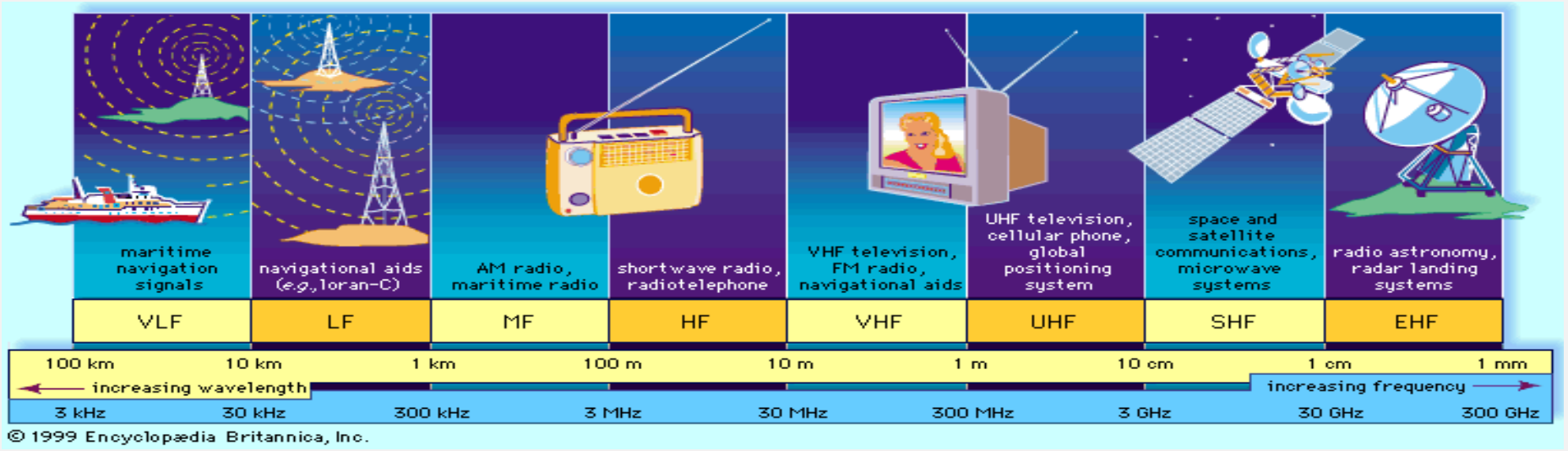


*AU: Astronautical Unit, the distance between the Earth and the sun, roughly 150 million kilometers

On **20 October 2020** at 22:13 UTC, **OSIRIS-REx** successfully touched down on Bennu.

# FREQUENCY SPECTRUM

Limited natural resource




| 1.467 GHz to 1.492 GHz | 1.518 GHz to 1.675 GHz | 1.97 GHz to 2.69 GHz | 3.4 GHz to 7.025 GHz | 10.7 GHz to 14.5 GHz | 17.3 GHz to 30 GHz |
|---|---|---|---|---|---|
| Satellite Audio Broadcasting to fixed and mobile units | Civilian Mobile-Satellite Services (two-way) | Satellite television & radio broadcasting to mobiles + two-way mobile services | Fixed-Satellite television, & data services (including broadcasting) | Fixed-Satellite television & data services (including broadcasting) | Fixed-Satellite television & data services (including broadcasting) |

# Satellite Frequencies and Services

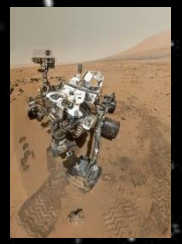
| | | |
|---|---|---|
| L-band | 1.0-2.0 GHz | Mobile Satellite Service (MSS)<br>Radionavigation Satellite Service |
| S-band | 2-4 GHz | Radars, MSS,<br>Broadcasting Satellite<br>Space Research |
| C-band | 3.4-7 GHz | Fixed Satellite Service (FSS), VSATs<br>Direct-To-Home (DTH) |
| X-band | 7-10 GHz | Radars, Satellite Imaging<br>Space Research |
| Ku-band | 10-15 GHz | FSS, VSAT<br>Broadcasting Satellite, MSS |
| Ka-band | 17.7 - 21.2,<br>27.5 – 31 GHz | FSS "broadband", inter-satellite links,<br>MSS |

# WHERE DO SATELLITES OPERATE …

GSO
35,786 km above equator

Molniya

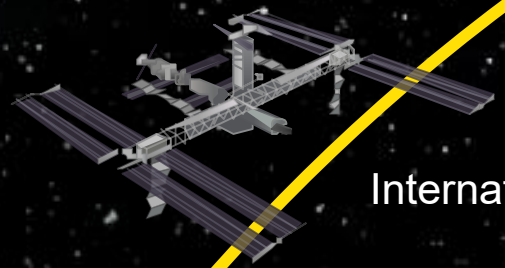
Highly Elliptical Orbit – 40 000 km in apogee



MEO
8 000 - 20 000 km

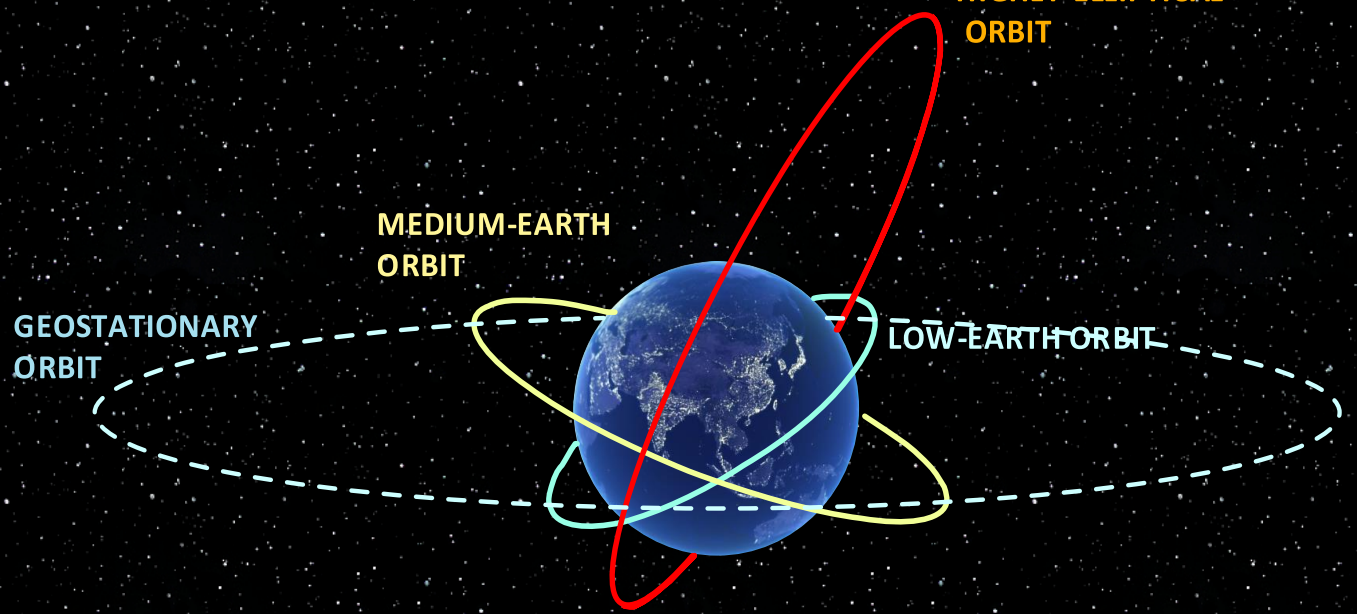
GNSS

LEO
400 - 2 000 km

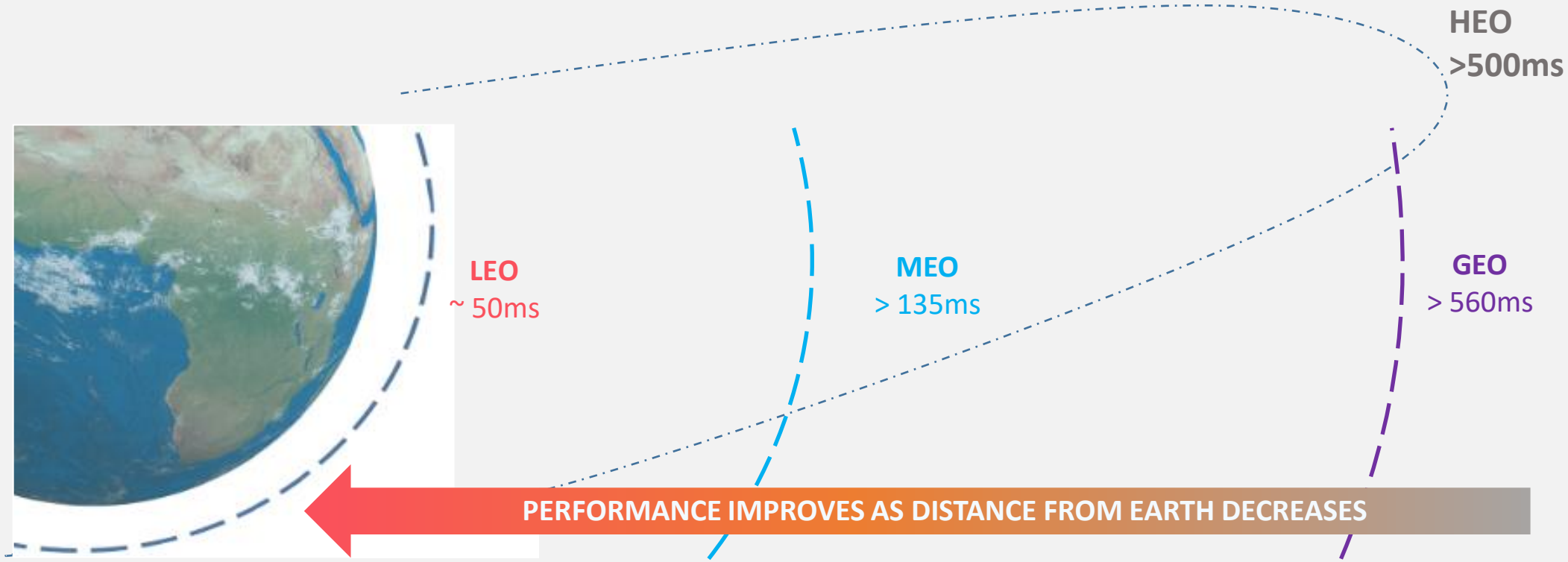


International Space Station

Sub-orbital



**Latency** is a time interval between the stimulation and response, or, from a more general point of view, a time delay between the cause and the effect of some physical change in the system being observed.



# Global Impact and Usage

## ... New

Satellite Radio

Corporate networks

Maritime communication

Earth Observation

National Security & Defense

affordable, high-speed, low latency broadband access for all

E-learning

Agriculture

Cellular Backhaul

Telemedicine

Aviation Security

Space Tourism

SNG

VSAT

Internet

Disaster Relief

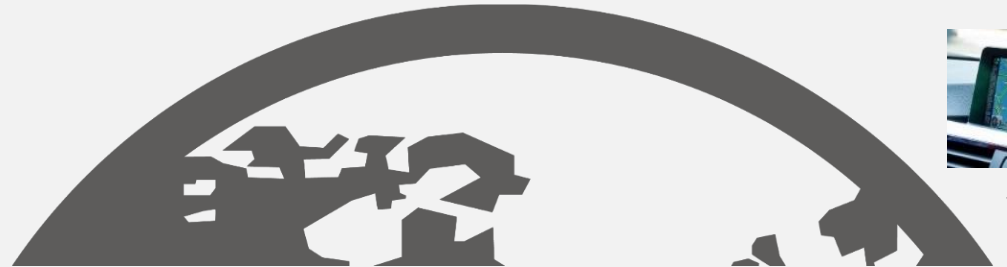
Global Flight Tracking

Asteroid Harvesting/ Mining

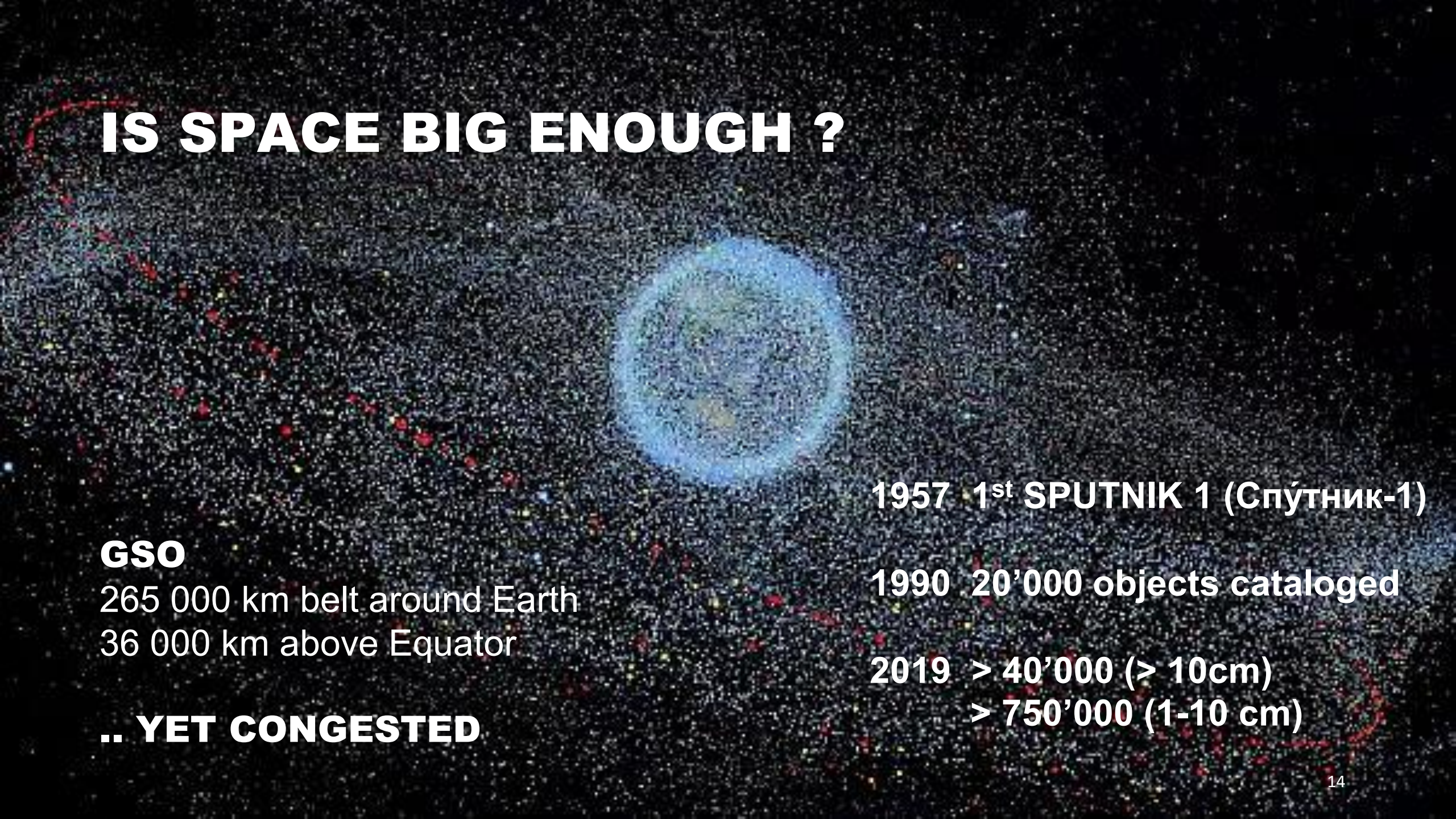
And much more!
Space fosters creativity

DTH

Satnav



# IS SPACE BIG ENOUGH ?



**GSO**
265 000 km belt around Earth
36 000 km above Equator

**.. YET CONGESTED**

**1957 1st SPUTNIK 1 (Спу́тник-1)**

**1990 20’000 objects cataloged**

**2019 > 40’000 (> 10cm)**
**> 750’000 (1-10 cm)**

# SATCAT Growth

**> 45,000 catalogued objects and growing**

Objects

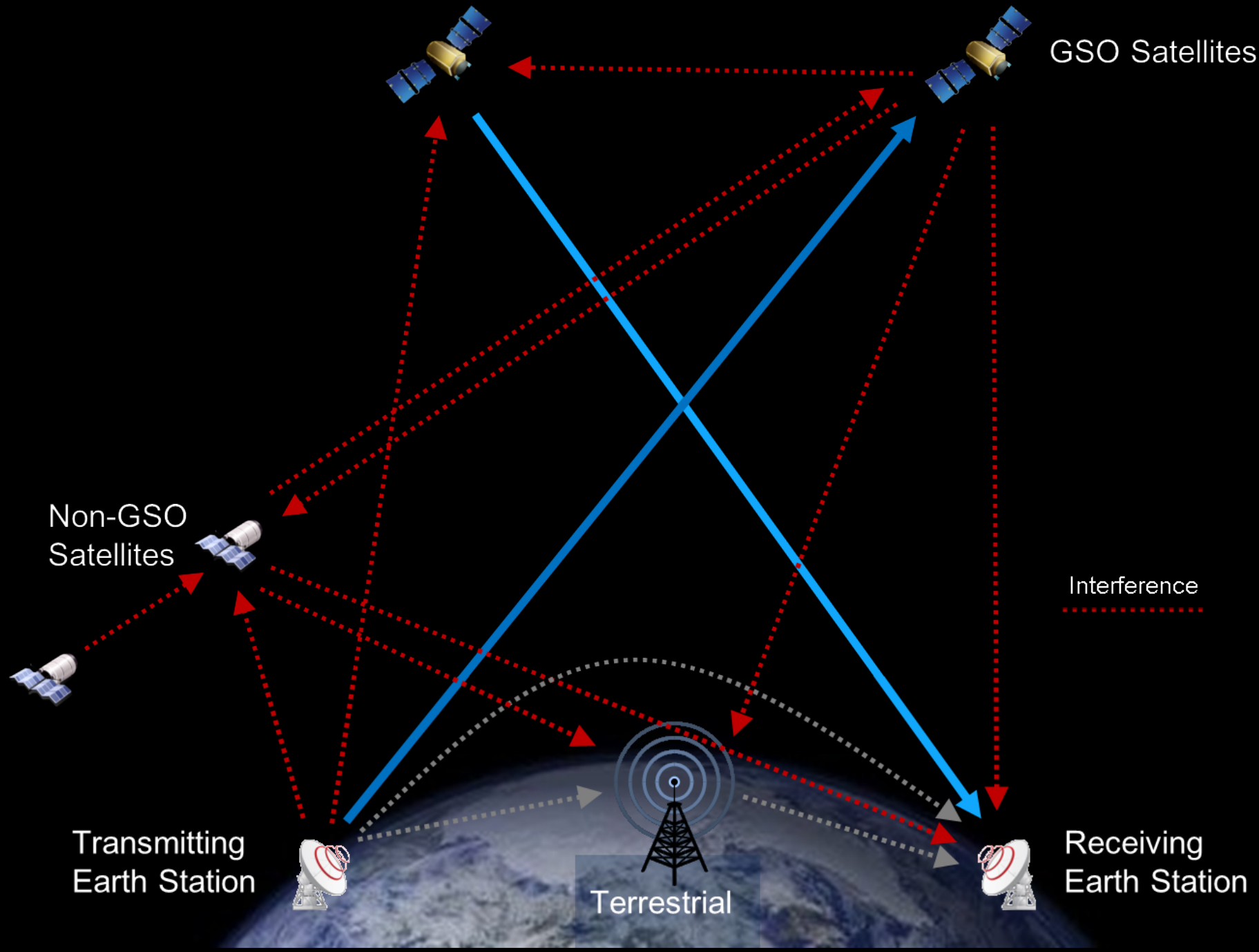
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0

1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

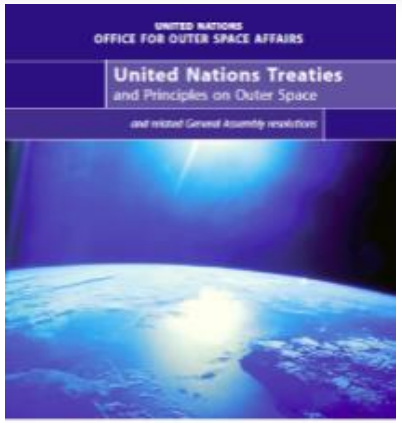
Date

Cataloged — On Orbit — Decayed

Source: CelesTrak, http://celestrak.com/satcat/growth.png
Date: 2020 Feb 11


GSO Satellites
Non-GSO
Satellites
Interference
Transmitting
Earth Station
Terrestrial
Receiving
Earth Station

# LEGAL FRAMEWORK FOR SPECTRUM ACCESS/USE




# UN OUTER SPACE TREATY (1967)

- Outer space free for exploitation and use by all states in conformity with international regulations
- States retain jurisdiction and control over objects launched into outer space
- States shall be liable for damage caused by their space objects

# INTERNATIONAL TREATIES

## 1967 “Outer Space Treaty”

Treaty on Principles Governing the Activities of States in Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies

## 1968 “Rescue Agreement”

Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space

## 1972 “Liability Convention”

Convention on International Liability for Damage Caused by Space Objects

## 1975 “Registration Convention”

Convention on Registration of Objects Launched into Outer Space

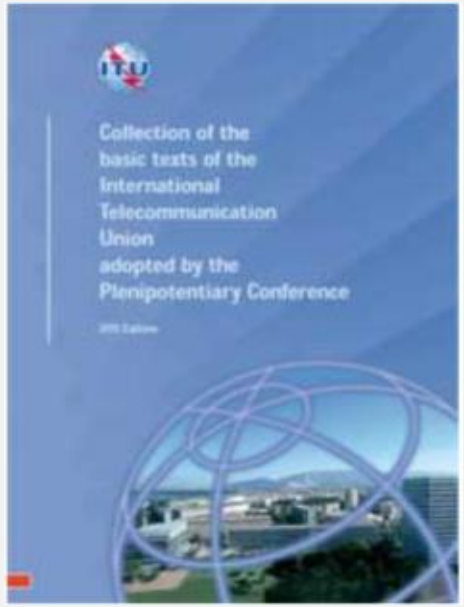
## 1979 “Moon Treaty”

Agreement Governing the Activities of States on the Moon and Other Celestial Bodies

***ITU Constitution/Convention of 1982 listed under other agreements***
***ITU is recognized as the specialized agency responsible for telecommunication issues***

# 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)

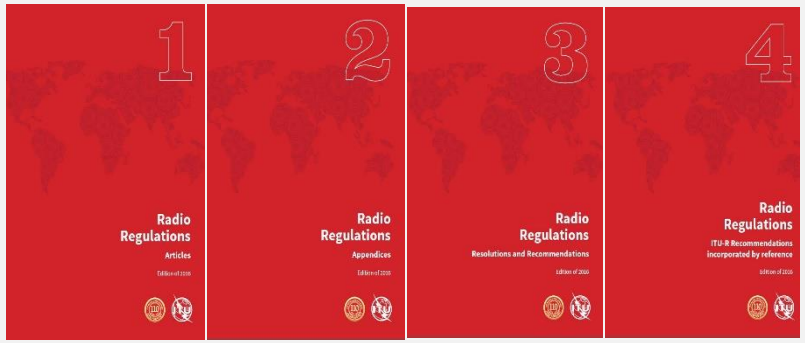



**ITU Constitution**
(Art.44)

Radio frequencies & satellite orbits are limited natural resources

Rational, Efficient, Economical Use

Equitable Access




# RADIO REGULATIONS

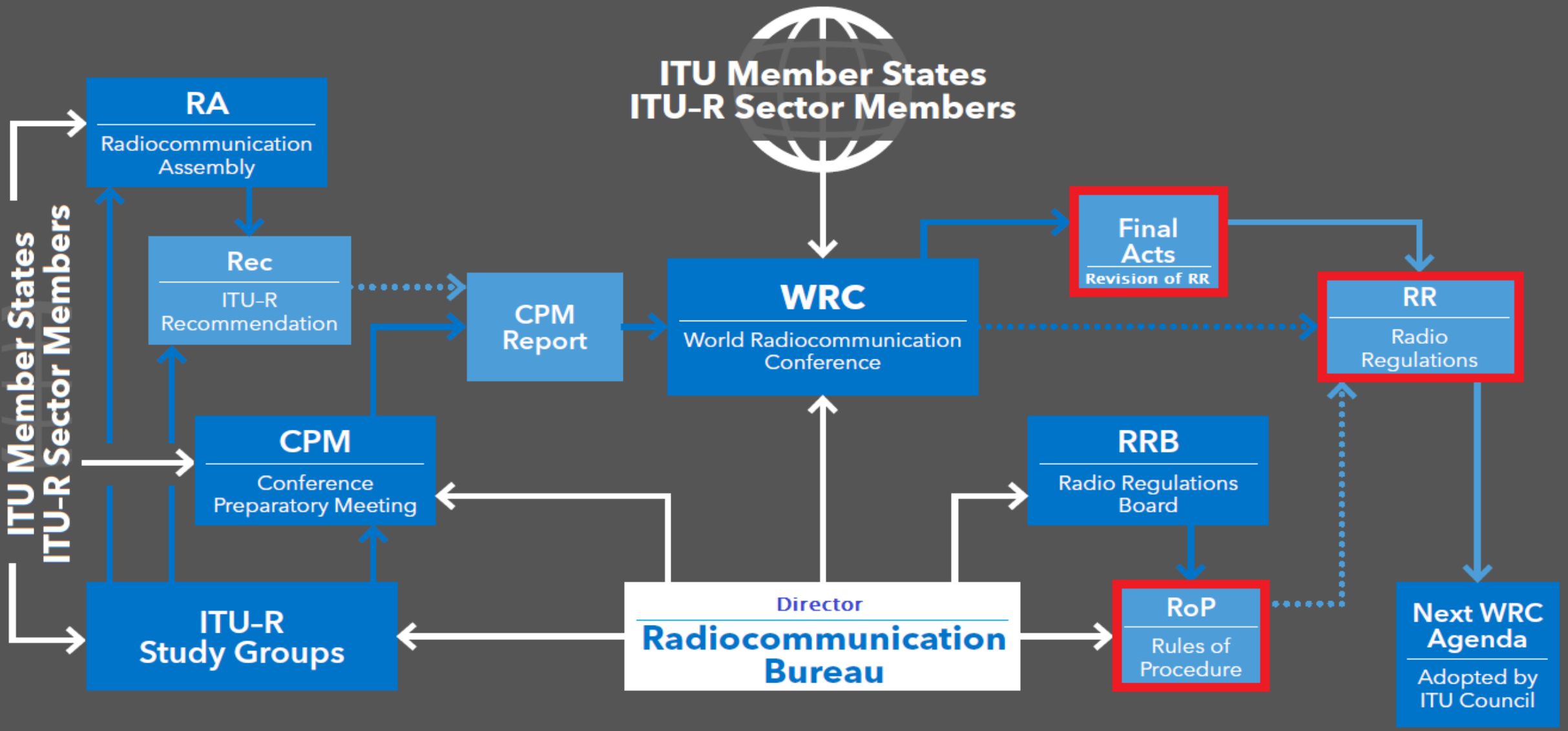
- **Intergovernmental Treaty** governing the use of spectrum/orbit resources by administrations
- Define **the rights and obligations** of Member States in respect of the use of these resources
- Recording of a frequency assignment in the Master Register (MIFR) provides **international recognition**

**TODAY**
More than 2000 pages of Radio Regulations

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

ITU RADIO REGULATIONS 110 1906 - 2016 ANNIVERSARY

# The World Radiocommunication Conference process




ITU-R: ITU Radiocommunication Sector

**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

**UN**

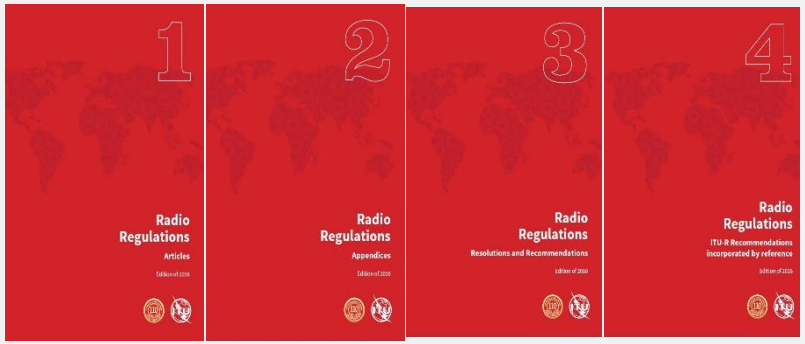
Outer Space instruments
on space objects

**ITU**

Instruments
on radio frequencies

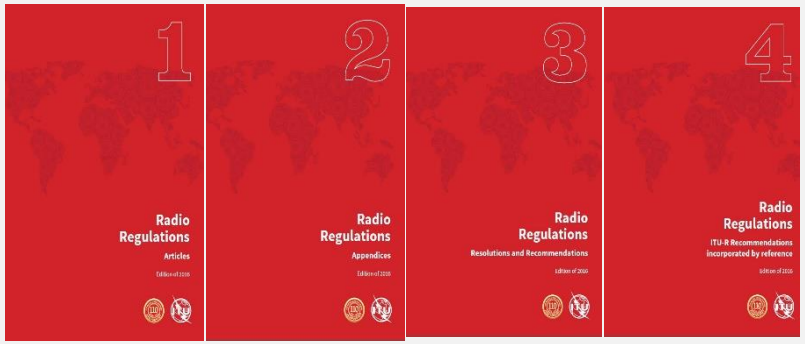
| | | |
|---|---|---|
| Free “exploration & use” under international law | ▶ | Equitable access & rational use of spectrum under international law |
| States<br>Responsibility & licensing<br>Jurisdiction & control | ▶ | States<br>Must license trans. radio stations<br>Shall not cause harmful interf. |
| States<br>Registration OOSA | ▶ | States<br>API…CR/C…MIFR |
| States<br>Liable for damage | ▶ | No Liability |

# REGULATION OF RADIO SPECTRUM AND SATELLITE ORBIT IN PRACTICE




**5.1** In all documents of the Union where the terms *allocation*, *allotment* and *assignment* are to be used, they shall have the meaning given them in Nos. **1.16** to **1.18**, the terms used in the six working languages being as follows:

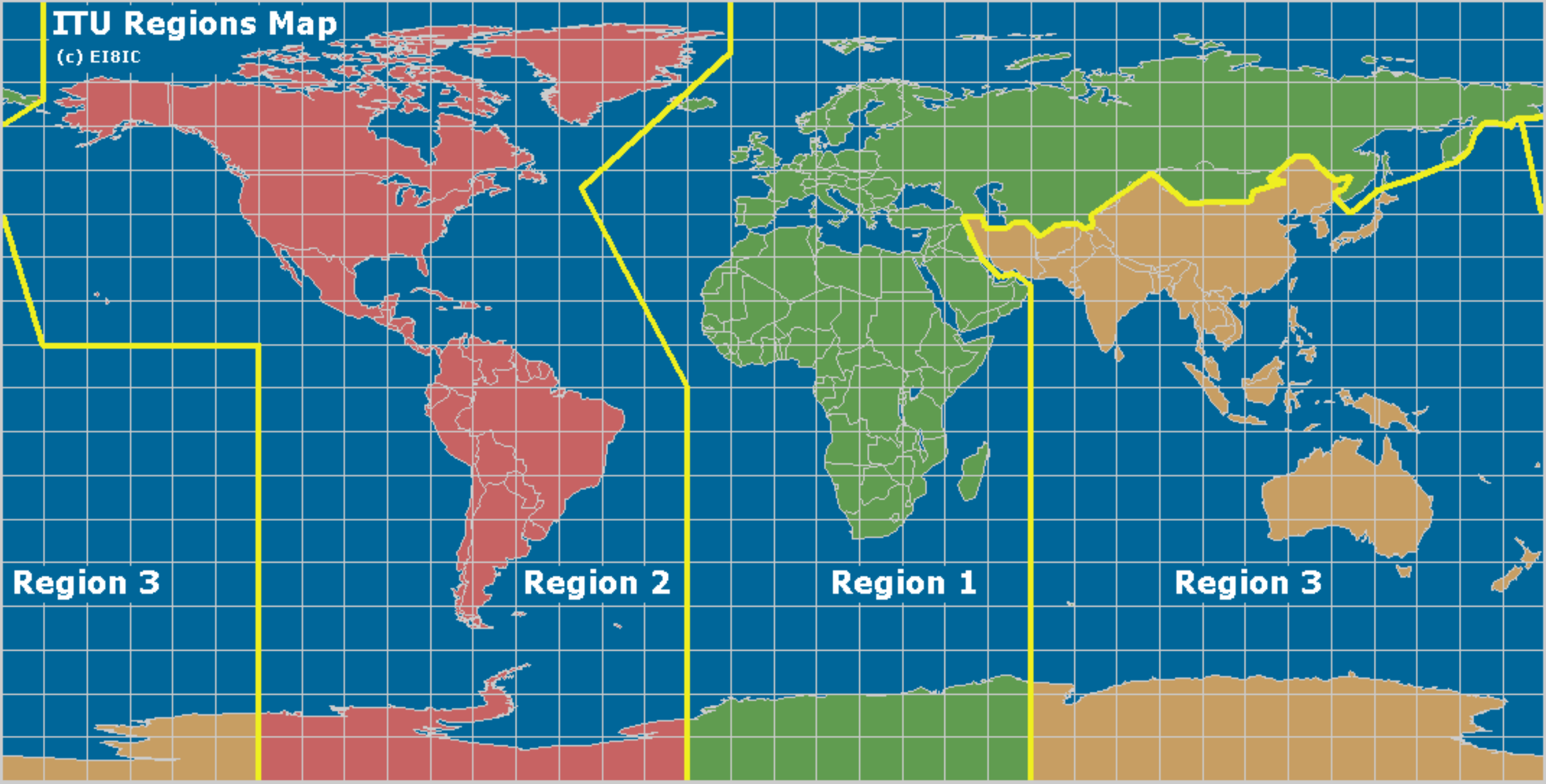
| Frequency distribution to | French | English | Spanish | Arabic | Chinese | Russian |
|---|---|---|---|---|---|---|
| Services | Attribution (attribuer) | Allocation (to allocate) | Atribución (atribuir) | توزيع (يوزع) | 划分 | распределение (распределять) |
| Areas or countries | Allotissement (allotir) | 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) |




**1.144** **out-of-band emission**: Emission on a frequency or frequencies immediately *outside the necessary bandwidth* which results from the modulation process, but excluding spurious emissions.

**1.145** **spurious emission**: Emission on a frequency or frequencies which are *outside the necessary bandwidth* and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

**1.146** **unwanted emissions**: Consist of spurious emissions and out-of-band emissions.


ITU Regions Map
(c) EI8IC
Region 3
Region 2
Region 1
Region 3

# In summary

Launch Vehicle

## INTERNATIONAL REGULATIONS

Equitable access
Rational, efficient, economical use
Operation without harmful interference

## COMMON GOAL

## SATELLITES

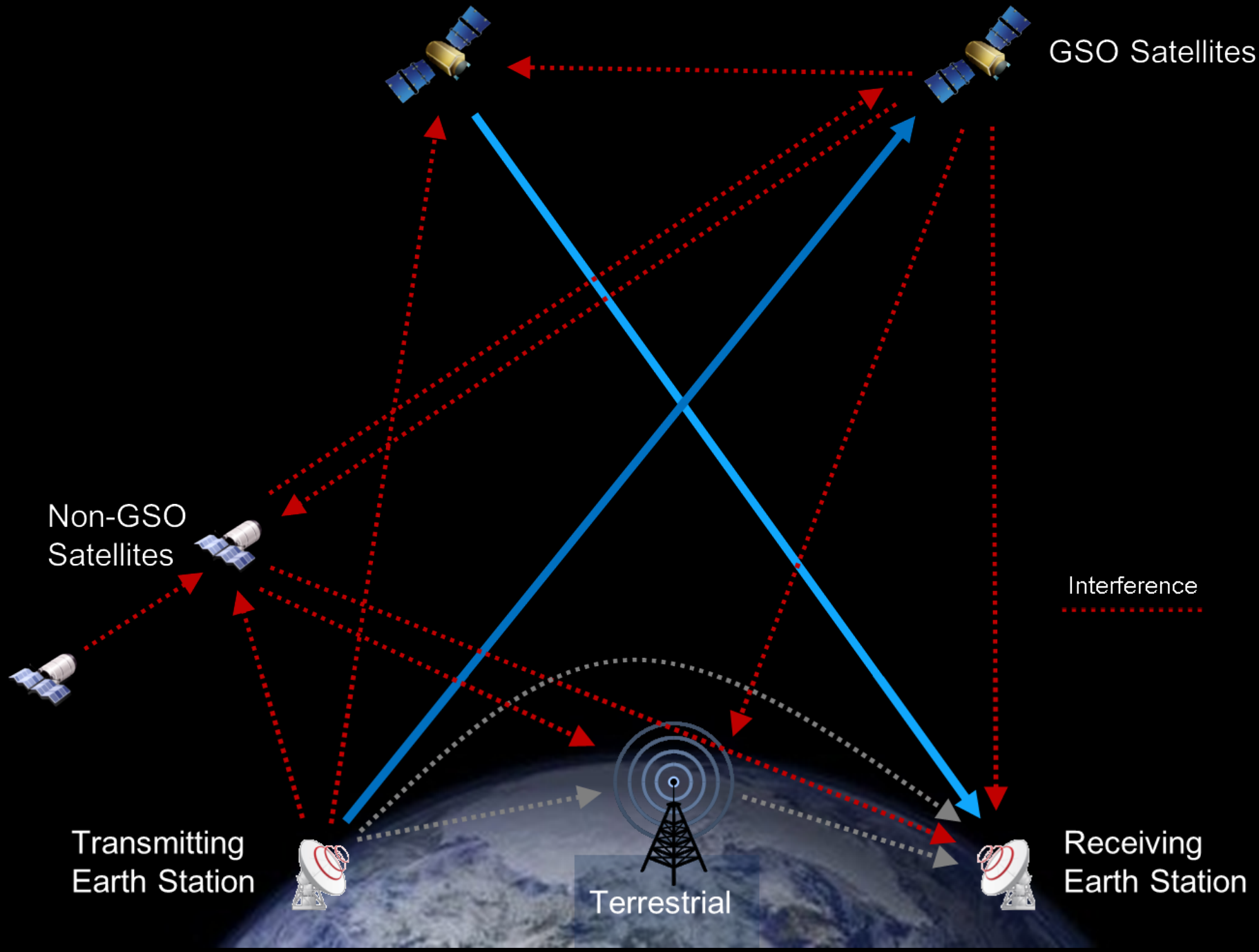
Wide coverage
Cross national borders
Facilitate connectivity

## ORBIT/ SPECTRUM

Limited
Global/Natural/Public resource

Source: Articles 1, 44, 45 & Res 71 of ITU Constitution & Convention

Photo credit: ESA (for educational purposes)


GSO Satellites
Non-GSO
Satellites
Interference
Transmitting
Earth Station
Terrestrial
Receiving
Earth Station

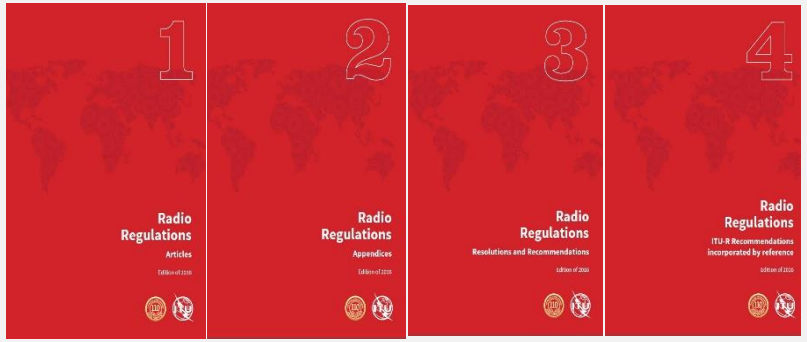
# PROPAGATION OF RADIO WAVES

- Laws of physics
- Radio waves do not stop at national borders

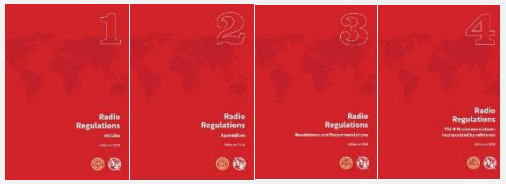
# INTERFERENCE

- Possible between radio stations of different countries
- High risk in Space Radiocommunications

# RADIO REGULATIONS




- One of its main purposes:
- Interference-free (controlled) operation of Radiocommunications

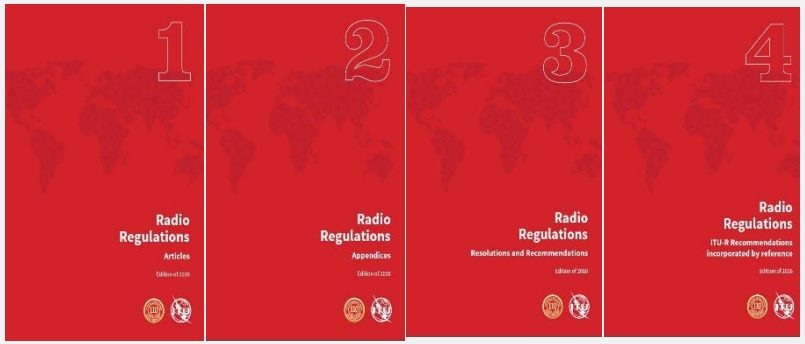



**1.166** ***interference:*** The effect of unwanted energy due to one or a combination of *emissions*, *radiations*, or inductions upon reception in a *radiocommunication* system, manifested by any performance degradation, misinterpretation, or loss of information which could be extracted in the absence of such unwanted energy

**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.

**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*.

**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).




# CONTROL OF INTERFERENCE

▼

# RADIO REGULATIONS

## ALLOCATION

Frequency separation of stations of different services

## COORDINATION

between Administrations to ensure interference-free operations conditions

## POWER LIMITS

PFD to protect TERR services / EIRP to protect SPACE services / EPFD to protect GSO from Non-GSO

## RECORDING

In the Master International Frequency Register (MIFR)
International recognition

## MONITORING

International monitoring system

# Harmful Interference Reported to ITU

- **Fixed Satellite Service, Broadcasting Satellite Service and associated Space Operations Functions in the frequency bands 6/4 GHz and 14-17-18/10-12 GHz**

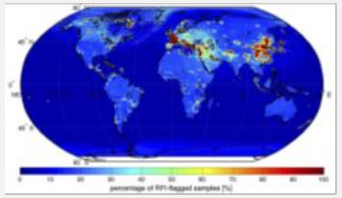
**Cause:** lack of coordination, unauthorized use, unnecessary emissions as defined in No. 15.1 of the Radio Regulations (typically a high-power unmodulated carrier) and technical/operational failures

**Impact:**

- **Earth Exploration Satellite Service ( passive ) in 1400-1427 MHz band**

**Cause:** 1) Unwanted emissions from radars and other radio devices operating in adjacent bands and exceeding levels contained in Resolution 750 ,
2) Unauthorized use of CCTV wireless devices making illegal use of the passive band in contradiction with No. 5.340 of the Radio Regulations,
3) Intermediate Frequency Radiation from BSS receivers due to poor shielding of cables and connectors.

**Impact:** loss of data or collection of wrong information about our planet



Source : BR Director's Report to WRC-19 – Annex 2 to Part-1

# Harmful Interference Reported to ITU

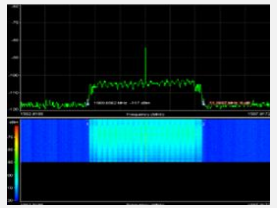
**Radio Navigation Satellite Service (RNSS) in the frequency bands 1 575.42 ± 15.345 MHz and 1 227.60 ± 11 MHz**

**Cause :** 1) Use of transmitting devices without the required authorization or license
2) Military exercises or operations near zones of conflict

**Impact:**







**Radio Regulations No. 15.28 : Absolute International Protection of Transmissions used for Safety and Regularity of Flights**

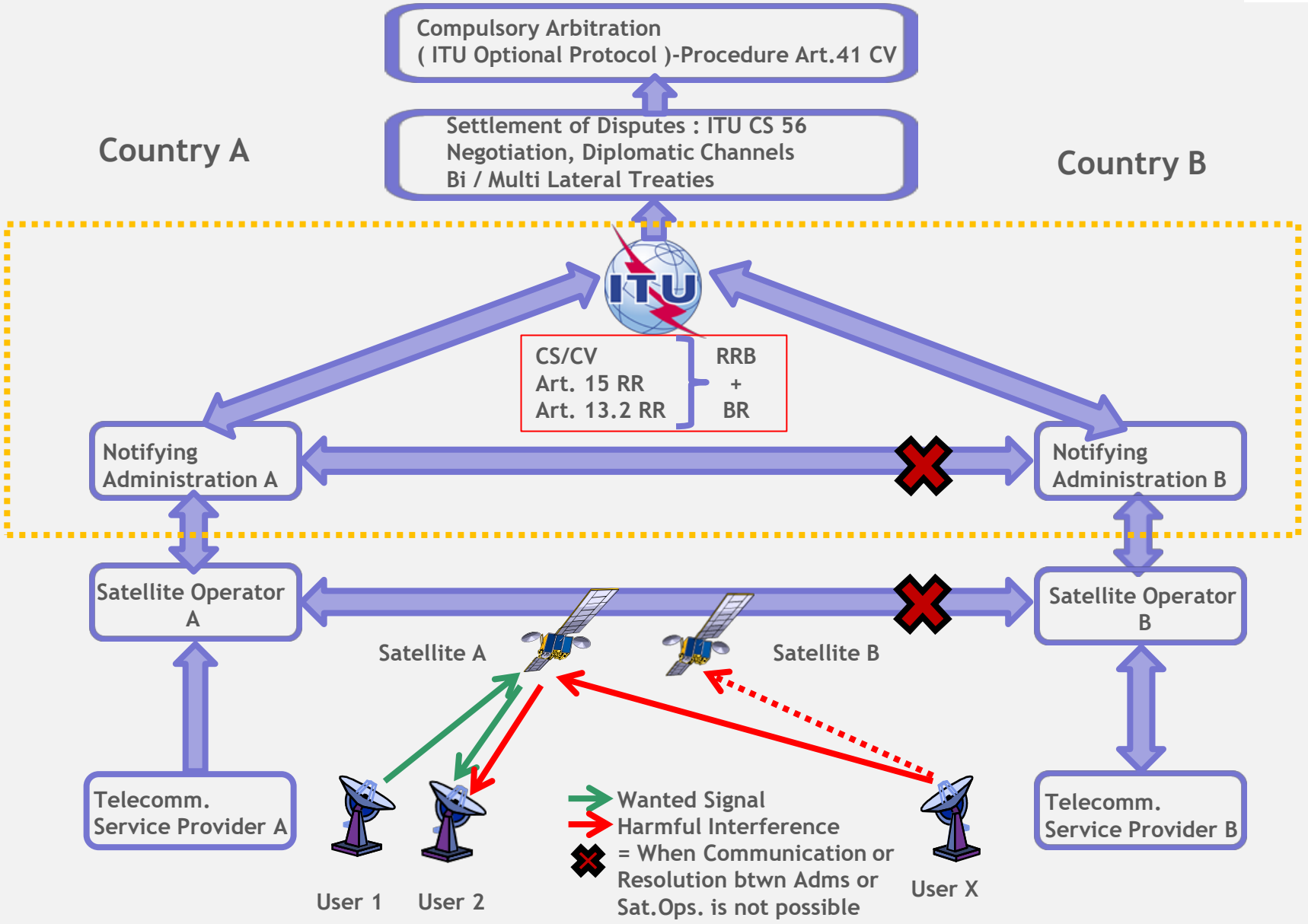
- **Mobile-Satellite-Service in the frequency bands 1 626.5-1 660.5 MHz, 1 980-2 010 MHz and 2 670-2 690 MHz**
- **Radio Astronomy Service in the frequency band 1610.6-1613.8 MHz**

Source : BR Director's Report to WRC-19 – Annex 2 to Part-1

# How ITU is tackling the interference problem ?

- **Prevention:** ITU-R Study Groups → RadioAssembly → World RadioConference → BR and Administrations apply RadioRegs (Coordination and Notification Procedures )
- **Correction:** Art 15 of RR → Radio Regulations Board
- **SIRRS** online application to facilitate Reporting and provide Assistance ( https://www.itu.int/en/ITU-R/space/SIRRS/Pages/default.aspx )
- **Informative Fora** to raise awareness of the impact of the interference and the need of cooperation to resolve it, presenting and discussing technical regulatory solutions.
- **International Monitoring System**
- **ITU-R Recommendations, Reports and Handbooks**

# Schema of Actions in case of Harmful Interference



# SHARING ORBIT/SPECTRUM RESOURCE

## 1. COORDINATION APPROACH

- First come, first served
- Rational, Efficient, Economical Use
- Rights acquired through coordination with administrations concerning actual usage
- Efficient spectrum/orbit management
- Dense/irregular orbital distribution of space stations

## 2. PLANNING APPROACH

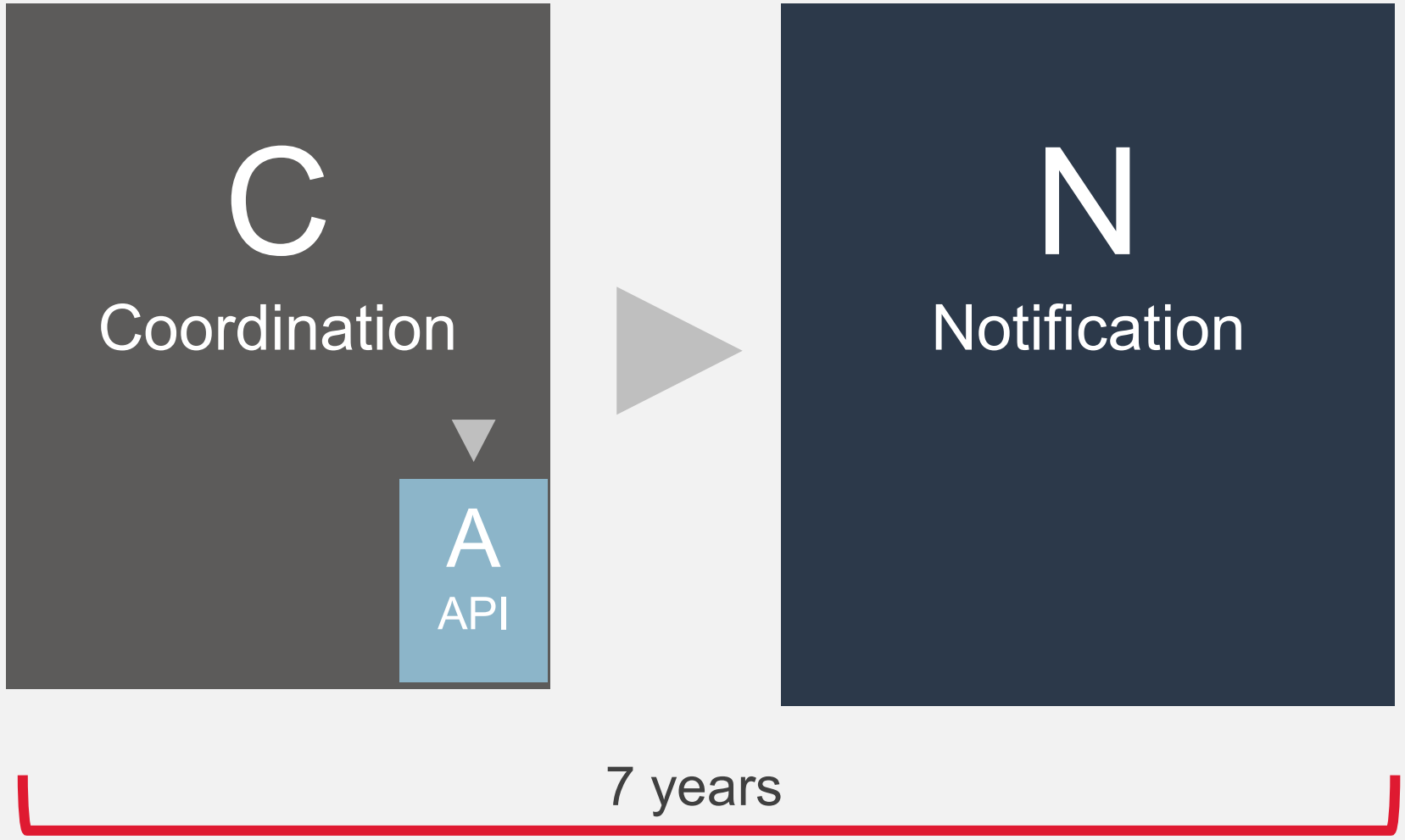
- Plan for future use
- Equitable Access
- Congestion of GSO
- Frequency/orbital position plans
- For future use by all countries
- Predetermined orbital position & frequency spectrum

International Recognition
Registration in **MIFR**


# NON-PLANNED SERVICES PROCEDURES

Articles 9 and 11

# Non-plan service Procedures (GSO & non-GSO) subject to coordination (Articles 9 & 11)



# Non-plan service Procedures (GSO & non-GSO) subject to coordination (Articles 9 & 11)

Submission of Satellite Network filling

(AP4)

C
Coordination

A
API

Conformity with RR & limits
Identified risk of Interference

Publication CR/C
(findings, list of coordinations)

Comment
≤ CR/C + 4 months

Negotiations

Modification of characteristics

to eliminate identified risk of Interference

N
Notification

Recording in Master Register (MIFR)

≥ BiU – 3 years

BiU
≤ API + 7 years

International recognition to use orbit/spectrum

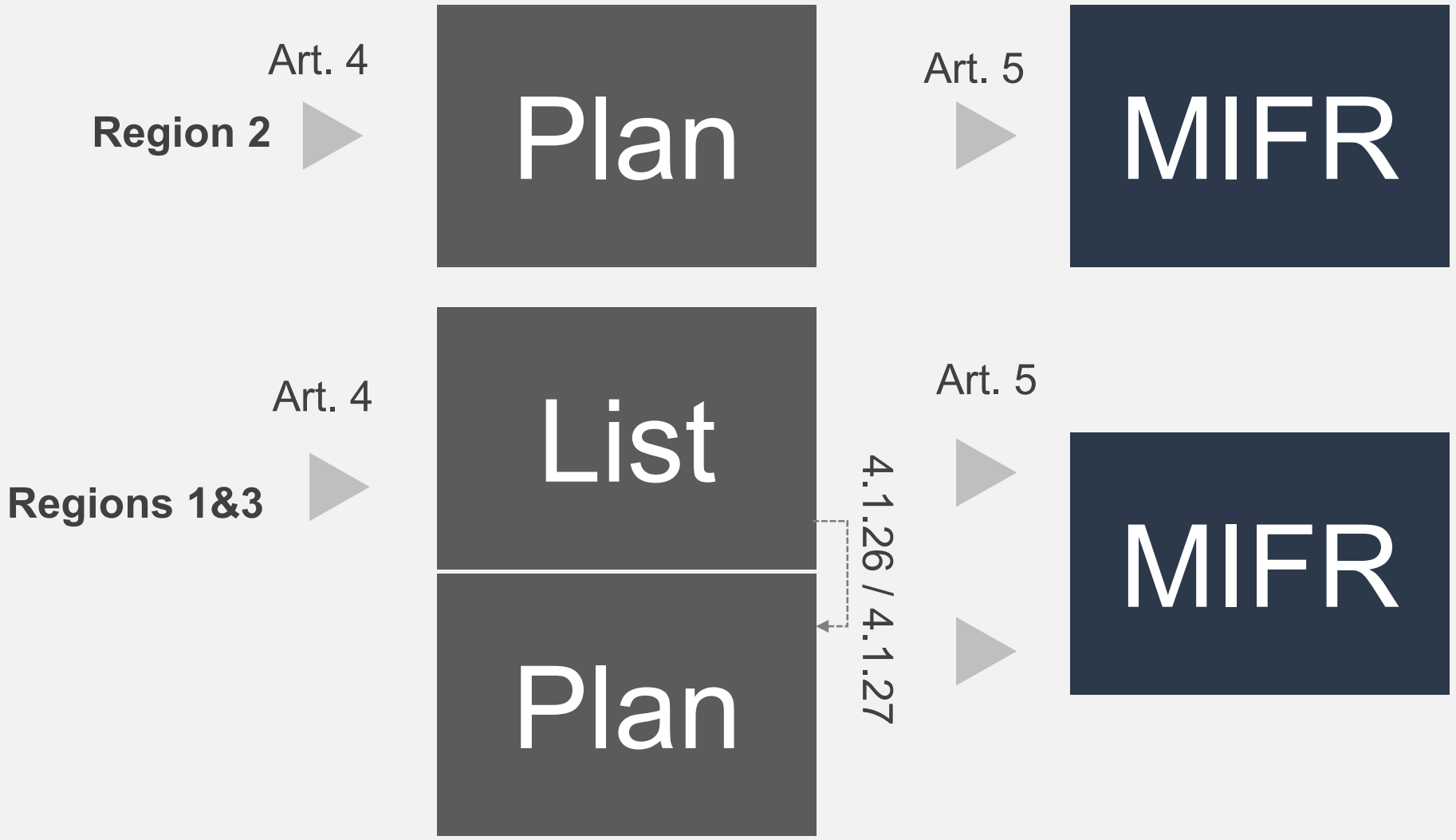
Max 7 years

Source: Nos. 9.1, 9.5D, 9.52C, 9.43, 11.44.1, 11.25, 11.44 of Radio Regulations – BiU: Bringing into Use

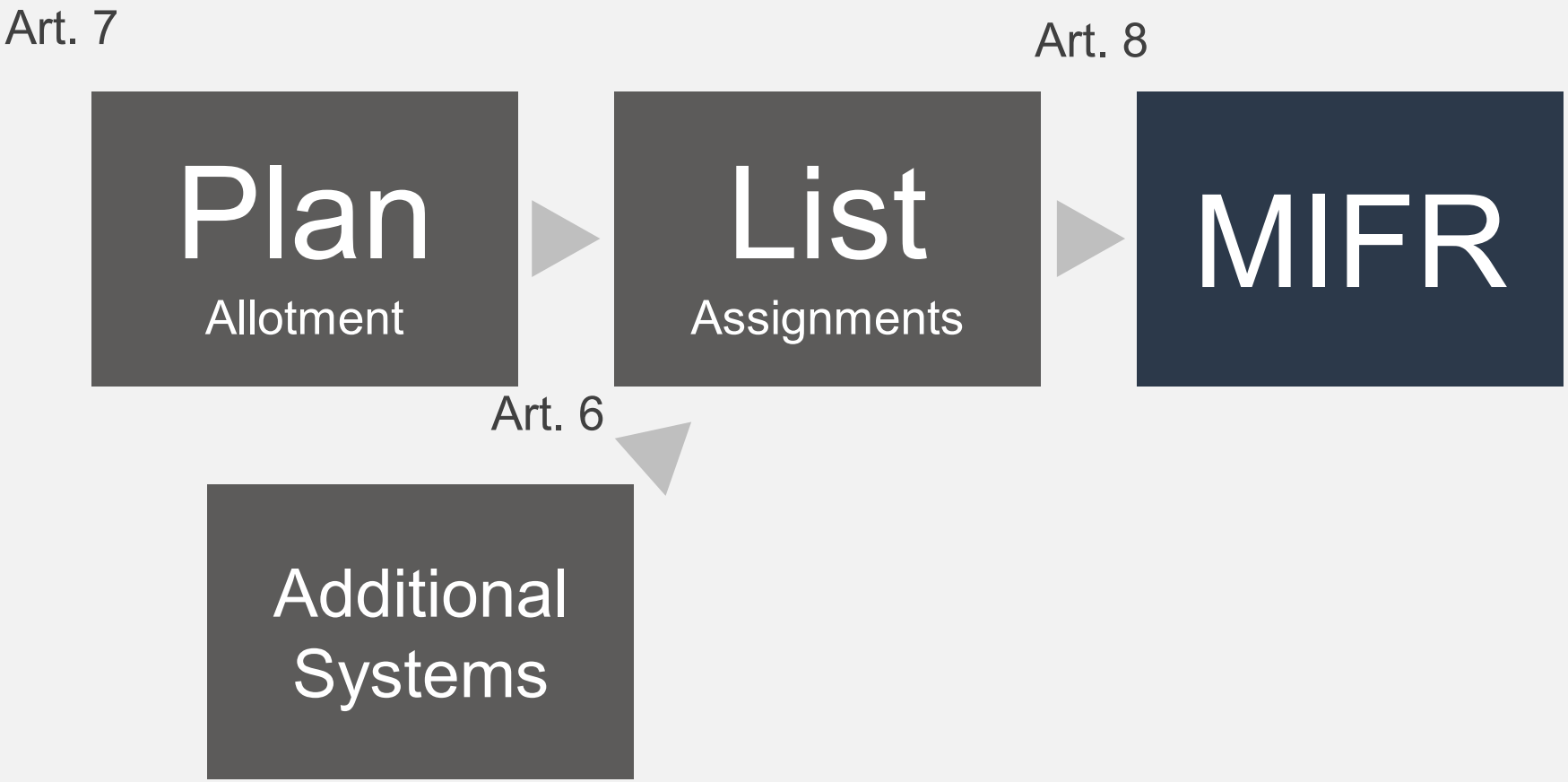

# PLANNED SERVICES PROCEDURES

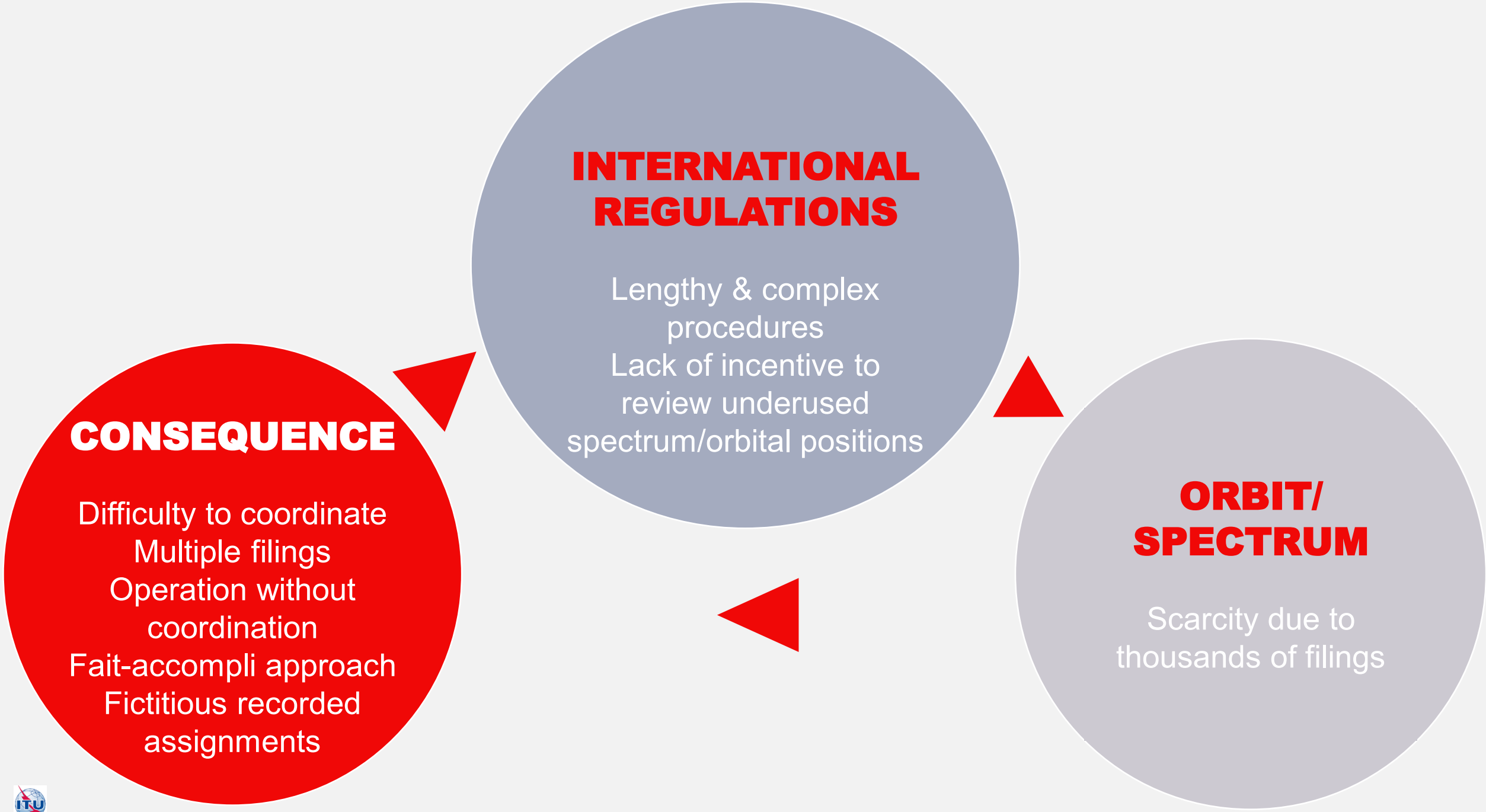
Appendix 30/30A,30B

# BSS Planned Procedures (GSO)
# (Appendix 30/30A)



# FSS Planned Procedures (GSO) (Appendix 30B)




INTERNATIONAL REGULATIONS
Lengthy & complex procedures
Lack of incentive to review underused spectrum/orbital positions
ORBIT/ SPECTRUM
Scarcity due to thousands of filings
CONSEQUENCE
Difficulty to coordinate
Multiple filings
Operation without coordination
Fait-accompli approach
Fictitious recorded assignments

# **ITU Constitution** (Art.44)

Radio frequencies & satellite orbits are limited natural resources

Rational, Efficient, Economical Use

Equitable Access

Opportunity to resolve interference **BEFORE** operation

**PREVENTS LOSS** of investment, customers & revenue by minimizing unusable capacity due to interference

# KEY POINTS

- **Natural limited resources** to be shared and regulated: orbit & radiofrequency spectrum
- Legal framework: UN Outer Space Treaties, ITU Constitution/Convention, **Radio Regulations**, Rules of Procedures, Recommendations
- ITU Constitution, Articles **44** & **45**:
  To avoid harmful interference
  To ensure efficient, rational, equitable economical use
- **Radio Regulations**: Allocation, registration, interference free operation
- Radio Regulations constantly being improved…Last **WRC-19** …Next **WRC-23**

# ITU WRC SHARM EL-SHEIKH 2019

28 October – 22 November
Sharm El-Sheikh, Egypt


- ✓ 17 Speific Agenda Items (AI) and 6 Standing AI
- ✓ 568 contributions and documents
- ✓ Paperless conference in 6 languages
- ✓ WRC-19 Provosional Final Acts (567 pages) signed on 22 November 2

**3420 participants:**

- ✓ 3160 delegates from 163 Member States
- ✓ 260 observers from ITU-R sector Members

https://www.itu.int/en/ITU-R/conferences/wrc/2019/Pages/default.aspx

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)

WRC 2019

Earth resources & Climate monitoring, Weather forecast,

Intelligent Transport System and unmanned transport

M2M for maritime, railway, road transport

Stations on board sub-orbital vehicles

# Agenda Item 7, Issue A

## BiU and Milestone Regime for NGSO systems

**Bring into Use (BiU)**
**NGSO systems**

Services: FSS, MSS and
BSS systems

All bands

**1 satellite for 90 days**

**Milestone Regime**

Services: FSS, MSS and
BSS systems
Bands: Ku, Ka and Q/V

Milestones **after 7-year period end**:

1. **2 years - 10%** (DF: 10)
2. **5 years - 50%** (DF: 2)
3. **7 years - 100%** (DF: 1)

Entry into force: **1st January 2021**

**If a MS is missed:** the filing is capped at # satellites launched x DF

# Agenda Item 7, Issue A

## Transitional systems and 1st Milestone Waiver

### Transitional Systems

Systems with a **7-year BIU deadline end before 1st January 2021**

Milestones start on 1st January 2021:

1. **10% - January 2023**
2. **50% - January 2026**
3. **100% - January 2028**

### 1st Milestone Waiver

Systems with **7-year period end before 28th November 2022**

**Submit to BR/RRB by 1st March 2023:**

1. Coordination report
2. *Launch contract* for 50% of the constellation
3. *Manufacturing contract* for 50% of the constellation

RRB to consider evidence, **including comments by other Admins** and submit report to WRC-23

Waiver is subject to approval by RRB and/or WRC-23

# WRC-23 Space related Agenda Items

## Secure existing satellite spectrum allocations

**1.2** IMT in 3/6/7/10 GHz - Res. **245** (WRC-19)

**1.3** Mobile Service in 3600-3800 MHz in Region 1 - Res. **246** (WRC-19)

**1.4** HIBS in IMT bands below 2.7 GHz - Res. **247** (WRC-19)

**9.1 c)** IMT in bands of the Fixed Service (FS) - Res. **175** (WRC-19)

## Boosting and improving existing satellite spectrum allocations

**1.6** regulatory provisions to facilitate sub-orbital vehicles operation – Res. **772 (WRC-19)**

**1.8** Use of FSS networks by CNPC of UAS (Res. 155 WRC-19) - Res. **171** (WRC-19)

**1.15** GSO FSS earth stations on aircraft and vessels in 12.75-13.25 GHz - Res. **172** (WRC-19)

**1.16** NGSO ESIMs in Ka-band - Res. **173** (WRC-19)

**7** Improvements to satellite procedures - Res. **86** (WRC-07)

***9.2*** *difficulties or inconsistencies encountered in the application of the Radio Regulations*

***9.3*** *on action in response to Resolution **80 (Rev.WRC-07)**;*

## … more spectrum for satellites!

**1.17** New ISS allocations for inter-satellite links - Res. **773** (WRC-19)

**1.18** New MSS allocations for narrow-band mobile satellite systems - Res. **248** (WRC-19)

**1.19** New primary FSS allocation in 17.3-17.7 GHz in R2 - Res. **174** (WRC-19)

# FREE ONLINE ACCESS

- The ITU Constitution
  - http://www.itu.int/pub/S-CONF-PLEN-2015
- World Radiocommunication Conference (WRC)
  - http://www.itu.int/ITU-R/go/wrc/en
- ITU-Radio Regulations @ 2020
  - https://www.itu.int/en/myitu/Publications/Radio-Regulations-2020
- ITU-R Recommendations
  - http://www.itu.int/publ/R-REC/en
- Preface to the BR IFIC (Space services)
  - http://www.itu.int/ITU-R/go/space-preface/en

"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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# ANNEX

Yvon Henri

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**Global Space Economy in 2018**

$ 360 billion

**Predicted to be in 2040s**

$ 1 trillion

Source: SSIR 2016 Tauri Group

# Plan Service Procedures (GSO)
# (RR Book 2 Appendices 30/30A & 30B)

## Broadcasting-Satellite Service and feeder-link Plans (BSS Plan)

11.7-12.2 GHz (Region 3),
11.7-12.5 GHz (Region 1),

12.2-12.7 GHz (Region 2),

17.3-18.1 GHz (Regions 1&3),
17.3-17.8 GHz (Region 2),
14.5-14.8 GHz (Regions 1&3 except Europe)

## Fixed-Satellite Service Plan (FSS Plan)

4’500 – 4’800 MHz
6’725 – 7’025 MHz

10.70 - 10.95 GHz

11.20 - 11.45 GHz / 12.75 - 13.25 GHz

# What if interference occurs during operation of the satellite? Article 15- Interference Infringement of the Constitution or Radio Regulations

•All stations are **forbidden** to carry out **unnecessary transmissions**, or the transmissions of **superfluous signals**, or the transmission of **false or misleading signals** or the transmission of **signals without identification**. (RR15.1)

• The station which is causing harmful interference **shall immediatly eliminate** this harmful interference

•This assumes a legal link between the transmit station and the administration under the jurisdiction of which it is placed:

•This is the purpose of the licence (Article 18 of the Radio Regulations)

# Study Groups structure overview

- Study Group 1 (SG 1): Spectrum management
- Study Group 3 (SG 3): Radio wave propagation
- Study Group 4 (SG 4): Satellite services
- Study Group 5 (SG 5): Terrestrial services
- Study Group 6 (SG 6): Broadcasting service
- Study Group 7 (SG 7): Science services
- Coordination Committee for Vocabulary (CCV)
- Conference Preparatory Meeting (CPM)

The BR provides the Secretariat to every ITU-R SG, headed by each SG Counsellor http://www.itu.int/en/ITU-R/study-groups