

# Orbit/Spectrum International Regulatory Framework

*Challenges in the  
21<sup>st</sup> century*

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# Legal Framework

## ■ United Nations 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 they have launched into outer space
- States shall be liable for damage caused by their space objects

# United Nations Outer Space Treaties

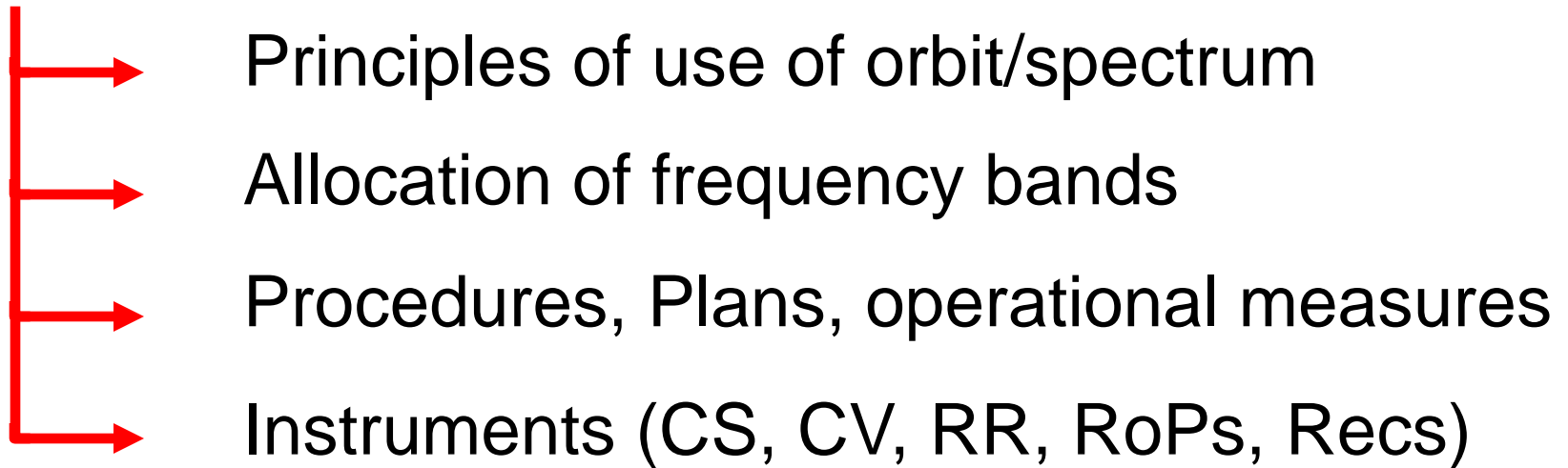
1. Principles Governing the Activities of States in the **Exploration and Use of Outer Space**, including the Moon and Other Celestial Bodies - 1967
2. The Agreement Governing the **Activities of States on the Moon and Other Celestial Bodies** - 1984
3. The **Agreement on the Rescue of Astronauts** -1968
4. The Convention on **International Liability for Damage Caused by Space Objects** (States retain jurisdiction and control over objects they launch into outer space) - 1972
5. The Convention on **Registration of Objects Launched into Outer Space** - 1976

**ITU - CS/CV of 1992 is listed under other agreements and ITU is recognized as the specialized agency responsible for telecommunication issues**



# Legal Framework

- United Nations Outer Space Treaty (1967)
- International Telecommunication Union



# ITU Constitution

## Article 44

Radio frequencies & satellite orbits are limited natural resources

Rational, Efficient, Economical Use

Equitable Access

# Purpose of the Union

- “The Union shall effect **allocation of bands** of the radio-frequency spectrum, the **allotment of radio frequencies** and the **registration of radio frequency assignments** and, for space services, of any associated orbital position in the geostationary-satellite orbit or any associated characteristics of satellite in other orbits, in order **to avoid harmful interference** between radio stations of different countries.”



# Objectives of ITU-R

- To avoid harmful interference
- To establish global standards and associated material to assure the necessary required performance, interoperability and quality
- To ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum and satellite-orbit resources

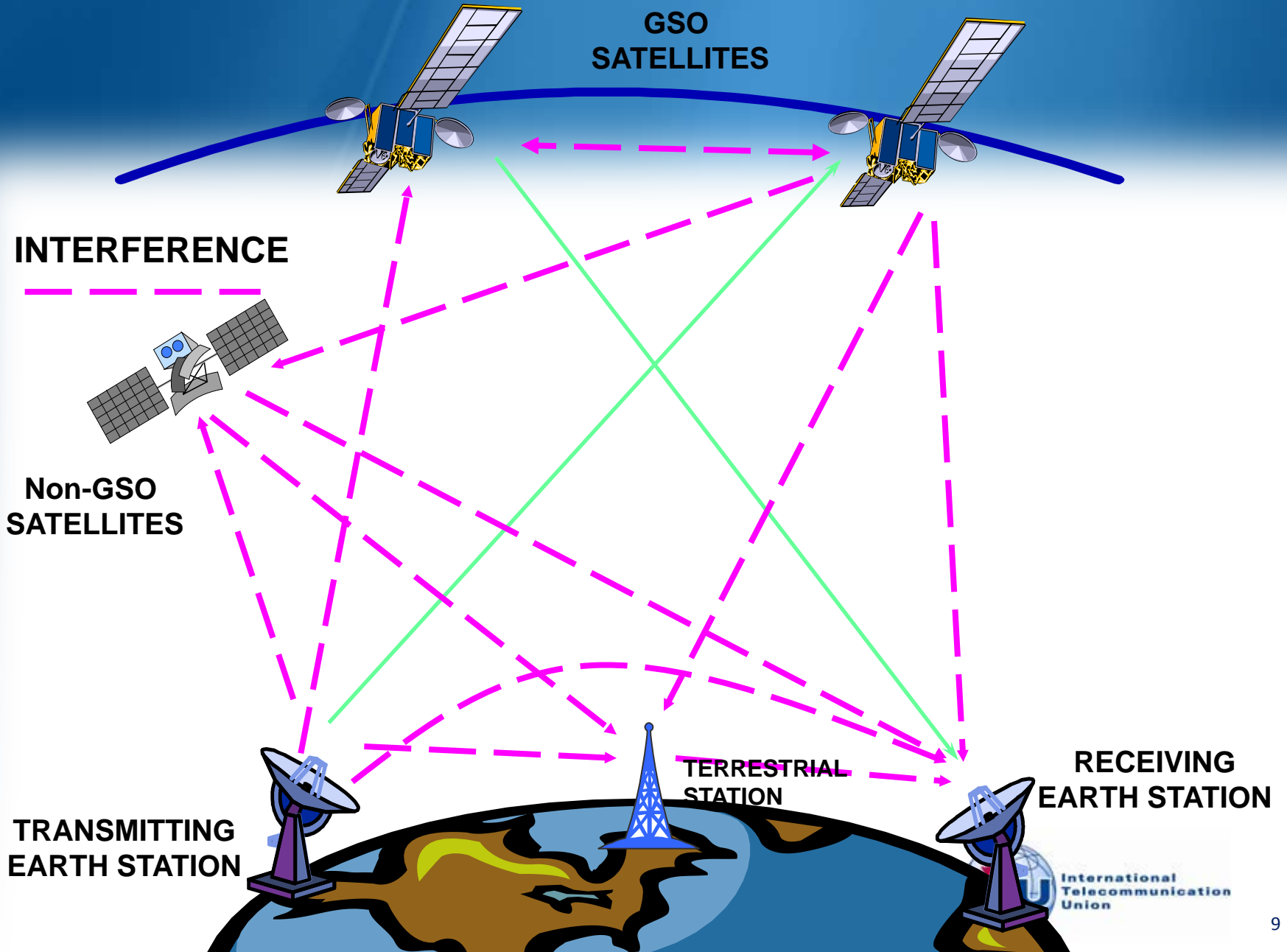


# Radio Regulations

- 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
- Updated every 3-4 years by World Radiocommunication Conferences, WRCs







# Propagation of Radio waves



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

## Interference



- possible between radio stations of different countries
- This risk is high in Space Radiocommunications

## Radio Regulations (RR)

- One of its main purposes - **Interference-free operation of Radiocommunications**

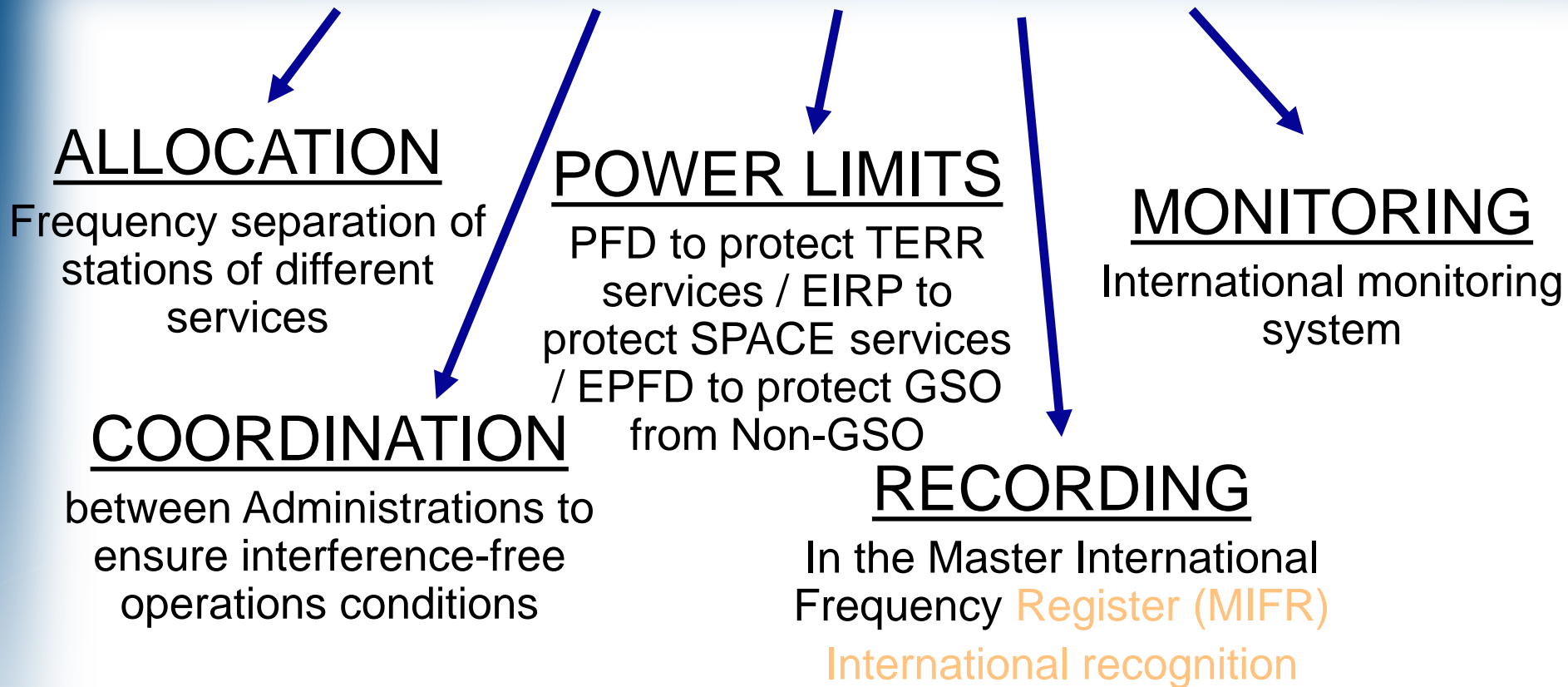
# Radio Regulations

## Procedure

- + Efficient use of spectrum
- + Equitable access
- + Opportunity to resolve interference before operation
- + Prevents loss of investment, customers & revenue by minimizing unusable capacity due to interference

# Radio Regulations Mechanisms

## Control of Interference



# 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)

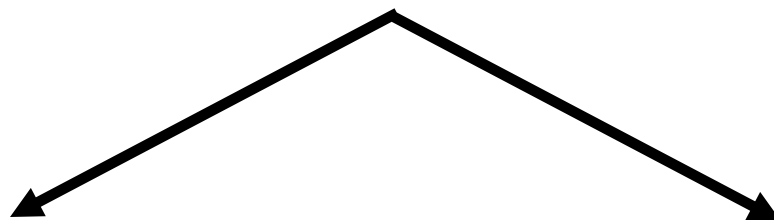
The station which is causing harmful interference *shall immediatly eliminate* this harmful interference

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



# Radio Regulations

- Rights & obligations + applicable procedures
- Two mechanisms of sharing orbit / spectrum:



## Coordination Approach

First come, first served for actual requirements

## Planning Approach

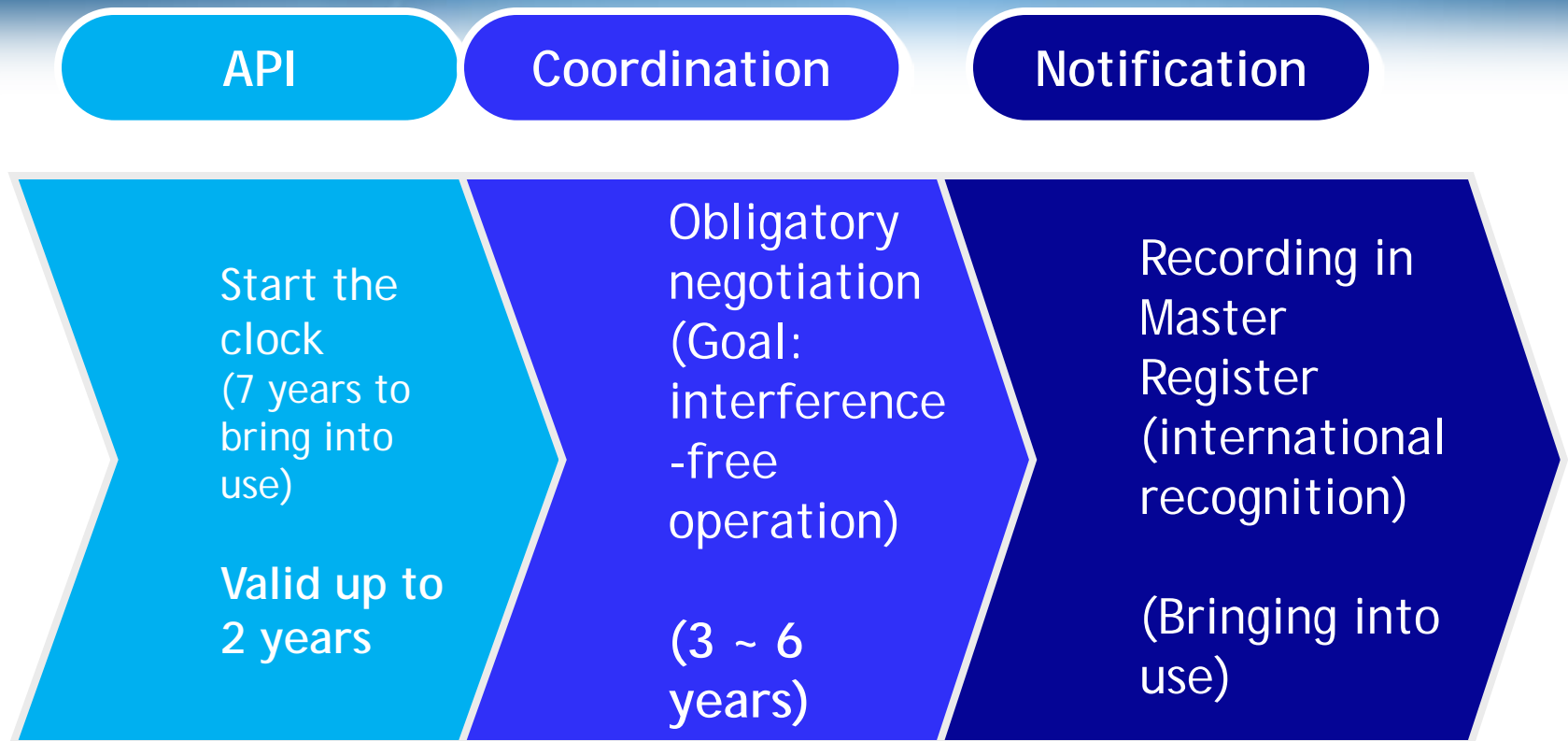
Equitable access  $\Leftrightarrow$  Plan for future use

# Efficient & Rational Utilization

## “First Come, First Served” Procedure

- Rights acquired through **coordination** with administrations concerning **actual usage**
- Efficient spectrum / orbit management
- Dense/irregular orbital distribution of space stations

# Summary for non-planned services ...





# Equitable Access

## Plan Procedure

- Congestion of the GSO
- Frequency / orbital position plans
- Guarantee for equitable access to the spectrum / orbital resources
  - Spectrum set aside for future use by all countries
  - Predetermined orbital position & frequency spectrum

## Consequences:

- Difficulty to complete coordination
- Multiple filing submissions
- Operation without prior coordination
- Fait-accompli approach
- Fictitious recorded assignments ...

Spectrum /orbit resource  
scarcity



## International regulatory framework:

- Lengthy & complex procedures
- Lack of incentive to review underused spectrum/orbital position

### Goal:

- To ensure rational, equitable, efficient and economical use of the radio frequency spectrum
- To ensure compliance of orbit/spectrum use with RR
- To develop procedures that facilitate access to the resources
- To guarantee interference-free satellite network operation...

### What to do?

- To introduce new milestones in Res 49
- To notify more realistic parameters at the notification/recording stage
- To charge fees for data in the MIFR
- To review satellite service/application definitions
- to introduce more deterrent enforcement mechanisms (...monitoring)
- to improve procedures?



# Question

*What mechanisms & practical strategies* can be employed to *ensure efficient use* of the spectrum/orbit resource and *improve* the existing international satellite spectrum management systems ?



**Participants: 3042**

**Countries: 165**

**Companies: 101**

- 33 Agenda items (Successfully addressed without a vote)
- First ITU paperless World conference in 6 Languages

# SpaceWISC Project

- **SpaceWISC (Web Interface for Secure Communication)**
  - *Web-based application that will handles electronic submission of space notices and administrative correspondence between the Administrations and Bureau*
- **ITU PP-10**, Decision 5 (Rev. Guadalajara, 2010), Annex 2, paragraph 20, “ *to move, to the extent practicable, from present communications by fax between the Union and Member States to modern electronic communication methods*”
- **WRC-12**, Resolutions **907** and **908** calls for use of *modern means of communication* related to **space notices** submission and administrative correspondence between the Bureau and Administrations

# SpaceWISC Project

- Resolutions **907** and **908** instructing the Bureau to address:
  - **Security issues** – Secure authentication and identification of Notifying Administration
  - **Reliable upload of submission** (notices and administrative documents) into a single location of reference – **BR registry** (*no more fax problems or email attachments size and security issue*)
  - **Submission of API data** for satellite networks or systems subject to coordination (RES **908**)
  - **Automatically acknowledge receipt, monitoring and logging** of the correspondence process ensure that no document is left not accessed by administrations
  - Report to **WRC-15** on the experience gained

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Thank you!