International Telecommunication Union

Orbit / Spectrum Allocation Procedures

Space Regulatory Workshop, Niamey, NIGER, 5-9 December 2011

Legal Framework

"Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 20.01.1967"

United Nations Outer Space Treaty (1967)

- Outer space is free for exploitation and use by all states in conformity with international regulations
  (to contrast with air space which is under national sovereignty)
- States retain jurisdiction and control over objects they have launched into outer space

Legal Framework

Basic elements that govern frequency spectrum / orbit usage by stations in space radiocommunication services:

- spectrum allocations to different categories of radiocommunication services;
- rights and obligations of Member administrations to obtain access to the spectrum/orbit resources;
- international recognition of these rights by recording frequency assignments and, as appropriate, orbital positions used or intended to be used in the Master International Frequency Register.

ITU Constitution

Article 44

↓

Use of radio frequency spectrum & orbit (natural resources)

↓

Rational, Efficient, Economical Use

↓

Equitable Access

Radio Regulations- a binding international treaty (No. 31 of the ITU Constitution)

Legal Framework

Nobody therefore owns any orbital position

but uses this common resource,

provided that,

international regulations & procedures are applied

States are thus obliged to establish appropriate supervision and control mechanisms on space networks

Regulatory framework & Changing demand for spectrum/orbit usage

PP Kyoto, 1994 in Res.18, called for in-depth review of the ITU spectrum/orbit resource allocation procedures

WRC-95 & 97

- ✓ **Reduction of the regulatory time-limit for bringing a satellite network into use**
- ✓ **Simplification of the information to be provided to initiate the registration process for a satellite network**

WRC-2000 and WRC-03 (in the context of Res. 86, PP 98 & PP 02)

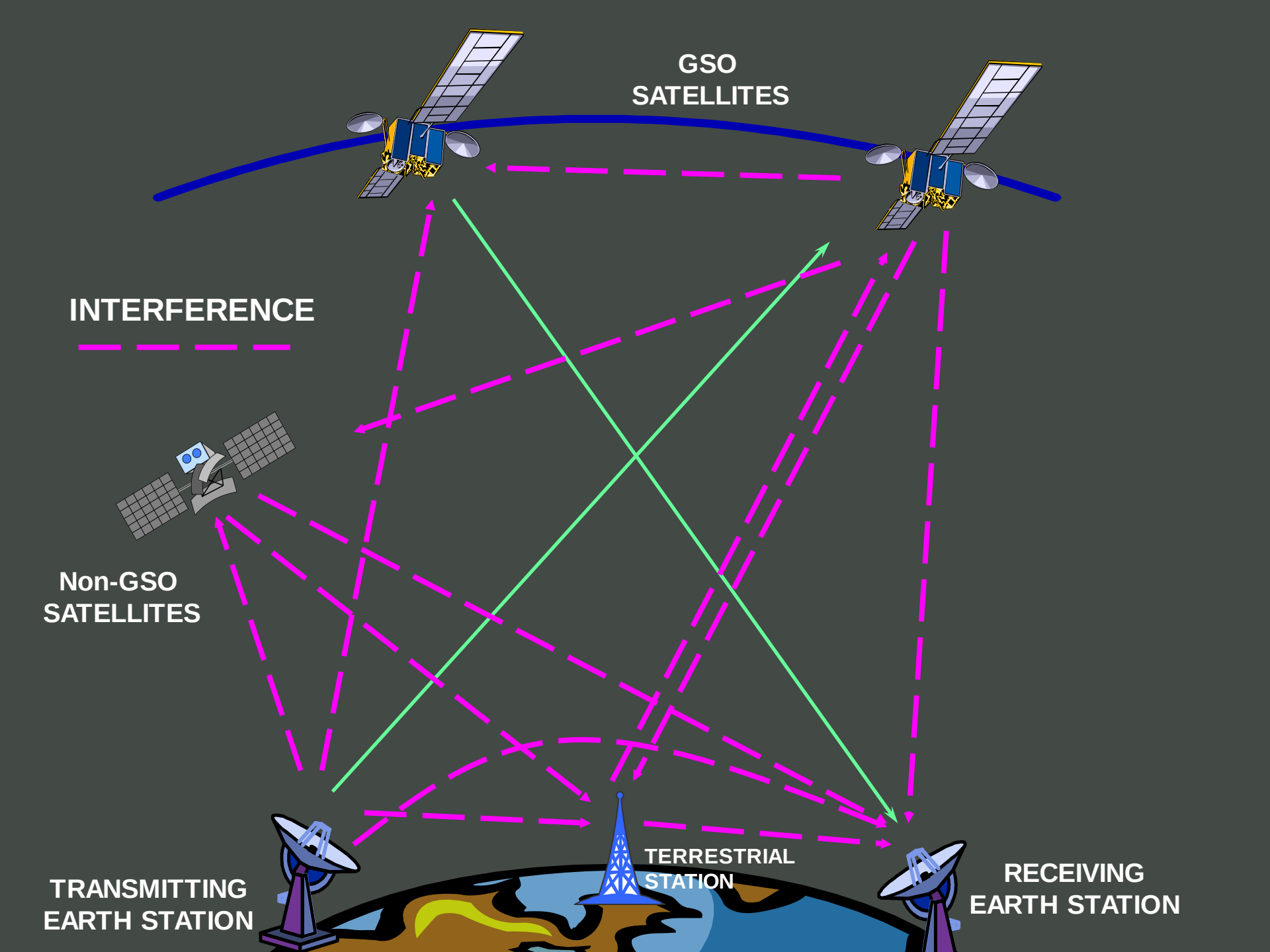
- ✓ **Improved access to data**
- ✓ **Mandatory electronic submission of information**
- ✓ **Coordination arc concept**
- ✓ **Mandatory deadline for submission of notification information**

Council

- ✓ **Decision 483 on cost recovery for satellite network filings**
- ✓ **Resolution 1182 regarding elimination of backlog in BR's processing of satellite filing**

WRC-07

- ✓ **Agenda item 1.12 considered possible changes to the satellite network registration procedure in response to Resolution 86 (Rev. Marrakesh, 02)**


GSO
SATELLITES
INTERFERENCE
Non-GSO
SATELLITES
TERRESTRIAL
STATION
TRANSMITTING
EARTH STATION
RECEIVING
EARTH STATION

Interference Free Operation

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 RadioComms

Radio Regulations

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

<u>Coordination Approach</u>

Efficiency ⇔ First come, first served for actual requirements

<u>Planning Approach</u>

Equitable access ⇔ Plan for future use

Radio Regulations

***A priori* planning procedures**

….Guaranteeing *equitable access*

- ***Plan for BSS in 11.7-12.7 GHz (Appendix 30)***
- ***Associated Plan for feeder links in 14 & 17 GHz bands (Appendix 30A)***
- ***Allotment Plan for FSS using part of 4/6 & 10-11/12-13 GHz bands (Appendix 30B)***

***Coordination* procedures**

…. On first come first served basis

- ***GSO (in all services and frequency bands) & Non-GSO networks (in certain frequency bands governed by the No. 9.11A procedure), subject to API and coordination procedures;***
- ***Other Non-GSO networks (all pertinent services and certain frequency bands) - require only API before notification.***

Coordination Procedures

- Article 9 Consolidates all coordination procedures
- Appendix 4 Specifies data elements
- Appendix 5 Criteria for identification of administrations with which coordination is to be effected or agreement sought
- Article **11** and Resolution **33** Provisions detailing the requirement for notification/recording of frequency assignments

Radio Regulation Mechanisms

Control of Interference

ALLOCATION

Frequency separation of stations of different services

POWER LIMITS

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

REGULATORY PROTECTION

e.g. No. 22.2: Non-GSO to protect GSO (FSS and BSS)

COORDINATION

between Administrations to arrive at interference-free operation / Process and Procedure described in RR

Efficient & Rational Utilization

Article 9 (Sect.I, II)
(Coordination procedure)

Article 11
(Notification procedure)

Article 21, 22
(Limits)

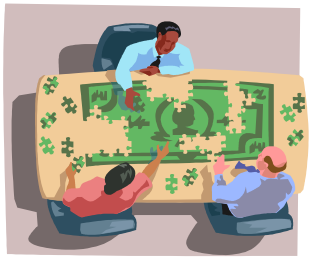
App. 4
App. 5

Res 49
...

Procedural Approach
Objectives

Exchange of information

Coordination



Efficient & Rational Utilization

"First Come, First Served" Procedure

- Right is acquired through <u>coordination</u> with administrations concerned by <u>actual usage</u>
- Efficient spectrum / orbit management
- Homogeneous orbital distribution of space stations
- Continuing responsibility for the networks

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

Radio Regulations

- Lengthy & complex procedure

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

ITU Radiocommunication Sector

Administrations

Organizations

ITU-R
MEMBERS

WRC conferences

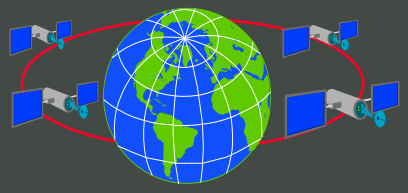
Radio Regulations BOARD

Radiocomm. BUREAU

STUDY GROUPs

Radio Regulations

9kHz spectrum 1000GHz



orbit

Rules of Procedures

ITU-R Recommendations

Thank you !