

ITU orbit/spectrum regulatory procedures

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Space operations - key points

- Any flying object in outer space **without** *a proper radiocommunication channel* is *just a dangerous piece of flying metal* (space debris)
- It is important to ensure that *any* outer space radio operation *avoids harmful interference (HI)* **to/from** other radiocommunication systems and services
- It is important to ensure the *availability and protection* **from** *harmful interference* of the frequencies provided for *distress and safety purposes*
- **Is there a solution ?**
YES – apply and follow the ITU Radio Regulations !



1906...

*First Radio-
Telegraph
conference
in Berlin*

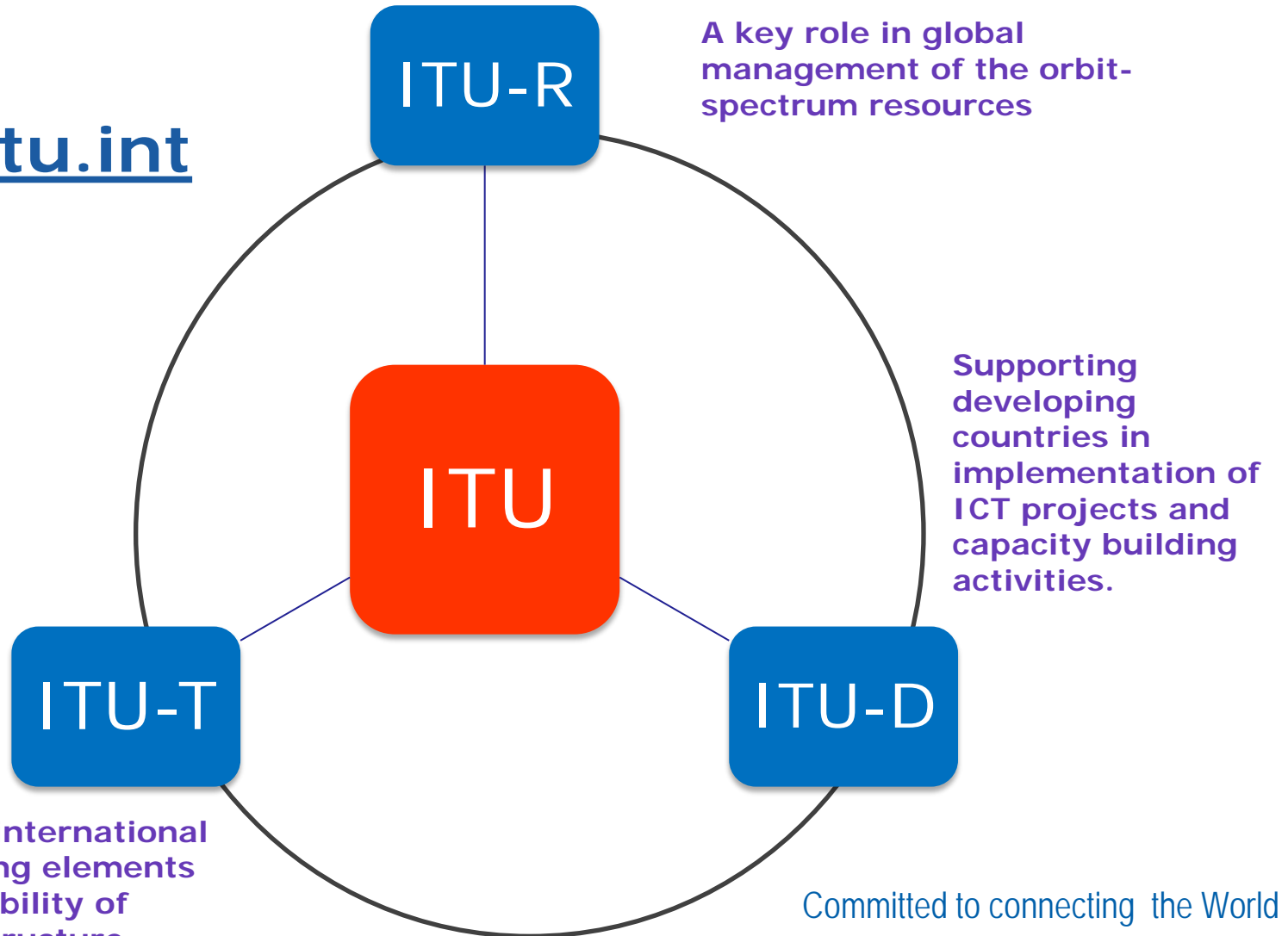
..today more
than 1000
pages

ITU Mission and Mandate

Leading UN agency for ICT



www.itu.int



A key role in global management of the orbit-spectrum resources

Supporting developing countries in implementation of ICT projects and capacity building activities.

Development of international standards defining elements in the interoperability of global ICT infrastructure.

Committed to connecting the World



1963

First Extra-ordinary Administrative Radio Conference to allocate frequency bands for *space radiocommunication purposes*

Legal Framework for Orbit/Spectrum Access/Use



UN Outer Space Treaty 1967

The UN recognizes the ITU as the specialized agency *responsible* for taking such action as may be appropriate under its basic instrument for the accomplishment of the purposes set forth therein (*Constitution (CS), Convention (CV), Radio Regulations (RR), Rules of Procedures (RoP), Recommendations (Rec)*)

- **Principles of use of orbit/spectrum**
 - **Allocation of frequency bands**
 - **Regulatory Procedures and Plans**
 - **Operational measures**
-

Legal Framework for Orbit/Spectrum Access/Use



ITU Constitution – Articles 44 and 45

Objectives:

- *To ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum and satellite-orbit resources in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries*
- *To avoid harmful interference*
- To establish global standards to assure the necessary required performance, interoperability and quality

Legal Framework for Orbit/Spectrum Access/Use



UN

Outer Space instruments
(*on space objects*)

Free “exploration and use”
OST Art. I
under international law



Art. VI States
“responsibility” & “licensing”
Art. VIII “jurisdiction & control”



States
Art. VIII Registration OOSA



Art. VII States
“liable” for **damage**



ITU

Instruments
(*on radio frequencies*)

Equitable access and
rational use of spectrum
under international law
CS ART 44

States
must **license** transmitting radio
stations **RR ART 18**
shall **not cause harmful**
CS ART 45 interference **RR ART 15**

States **RR ART 9, 11**
API_CR/C_MIFR

No liability clauses

ITU Radio Regulations

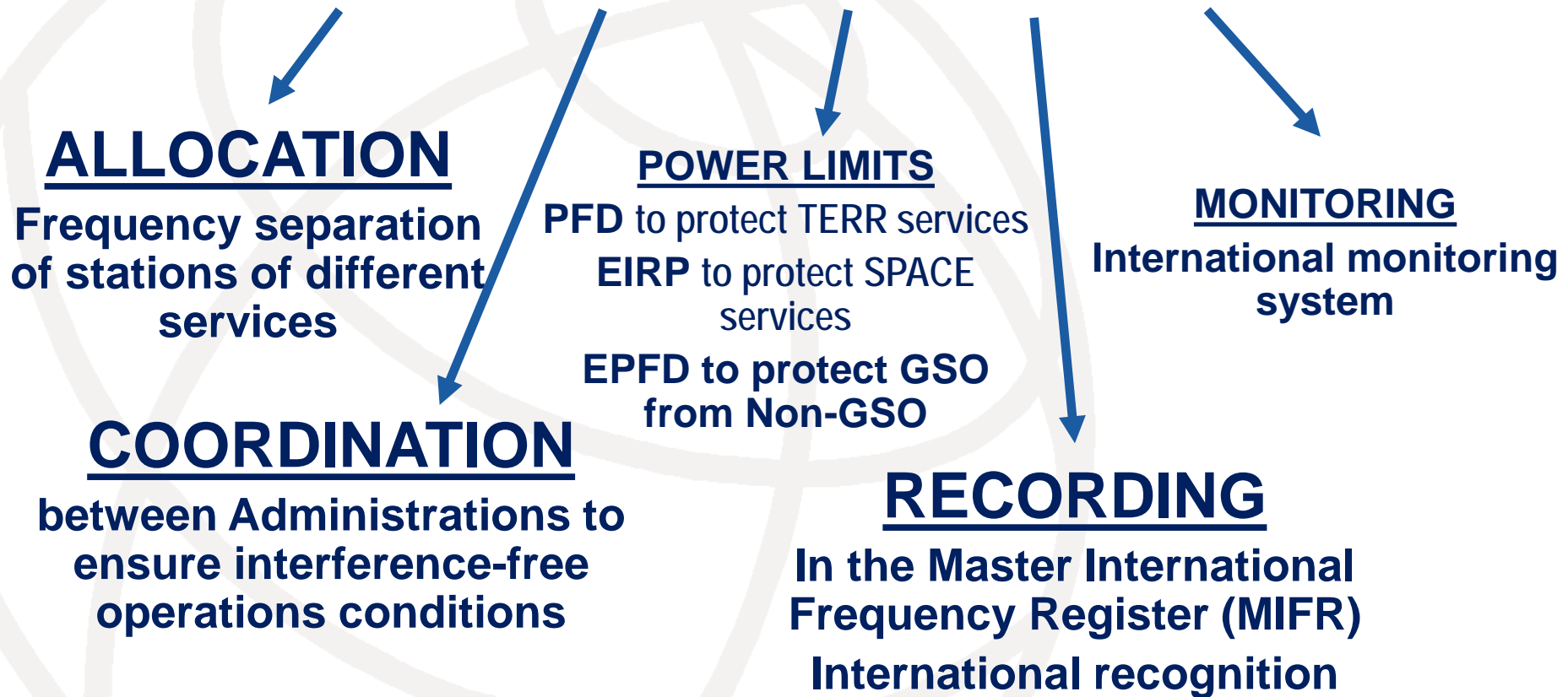
- Intergovernmental Treaty, *legal bindings* on all Member states, governing the *use of spectrum/orbit resources by all radiocommunication services*
- Define the *rights* and *obligations* of Member states in respect of the use of spectrum/orbit resources
- The ITU Radio Regulations incorporates the decisions of World Radiocommunication Conference (**WRC**)



Radio Regulations Mechanisms - 1



Control of Interference



Radio Regulations Mechanisms - 2



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

Coordination Approach

First come, first served for actual requirements

Planning Approach

Equitable access \Leftrightarrow Plan for future use

International Recognition
Registration in the MIFR

WRC-15 key facts

- WRC-15 performed a detailed review of the Radio Regulations (RR) and its Rules of Procedure (RoP)
- **3275** participants attended WRC-15, including:
 - **2780** participants from **162** Member States, and
 - **795** observers representing **130** other entities, including industry
- **19** Agenda items and **GFT**
- WRC-15 addressed over **40** topics related to frequency allocation and frequency sharing for the efficient use of spectrum and orbital resources

<http://www.itu.int/go/wrc-15>



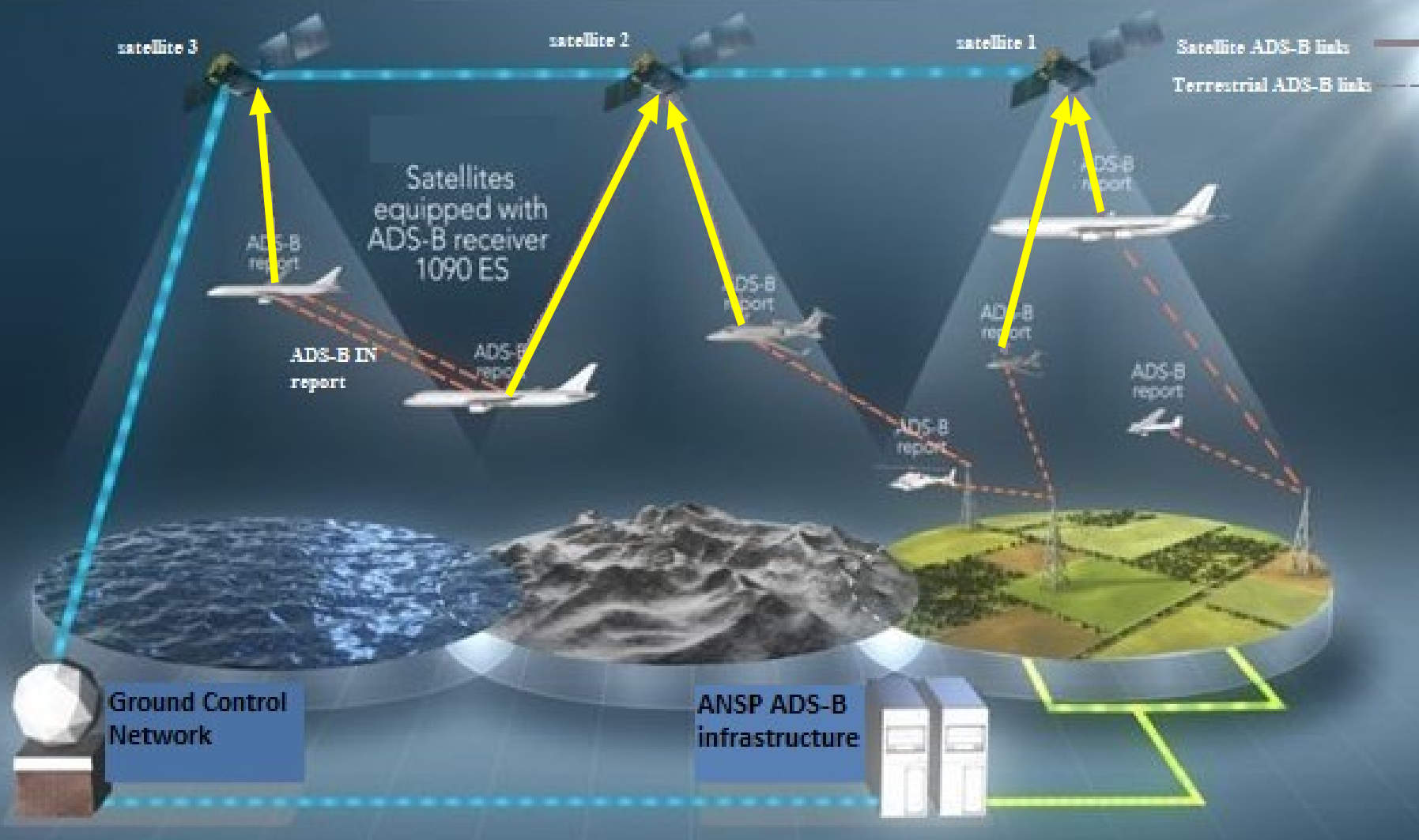
RES-425 (WRC-15) - Use of the freq band 1 087.7-1 092.3 MHz by the aeronautical mobile-satellite (R) service (Earth-to-space) to facilitate global flight tracking (**GFT**) for civil aviation

- RES-425 will protect essential frequency band for **real-time GFT** and *surveillance* of aircraft through ADS-B over satellite
- *Current ATC can't go beyond the LOS of terrestrial radar or ADS-B stations*, leaving the vast majority of the planet without ATC traffic surveillance
- This WRC-15 historical decision about the GFT will extend ATC surveillance coverage of ADS-B equipped aircraft from *30 percent terrestrial coverage* available today to *100% Global coverage*

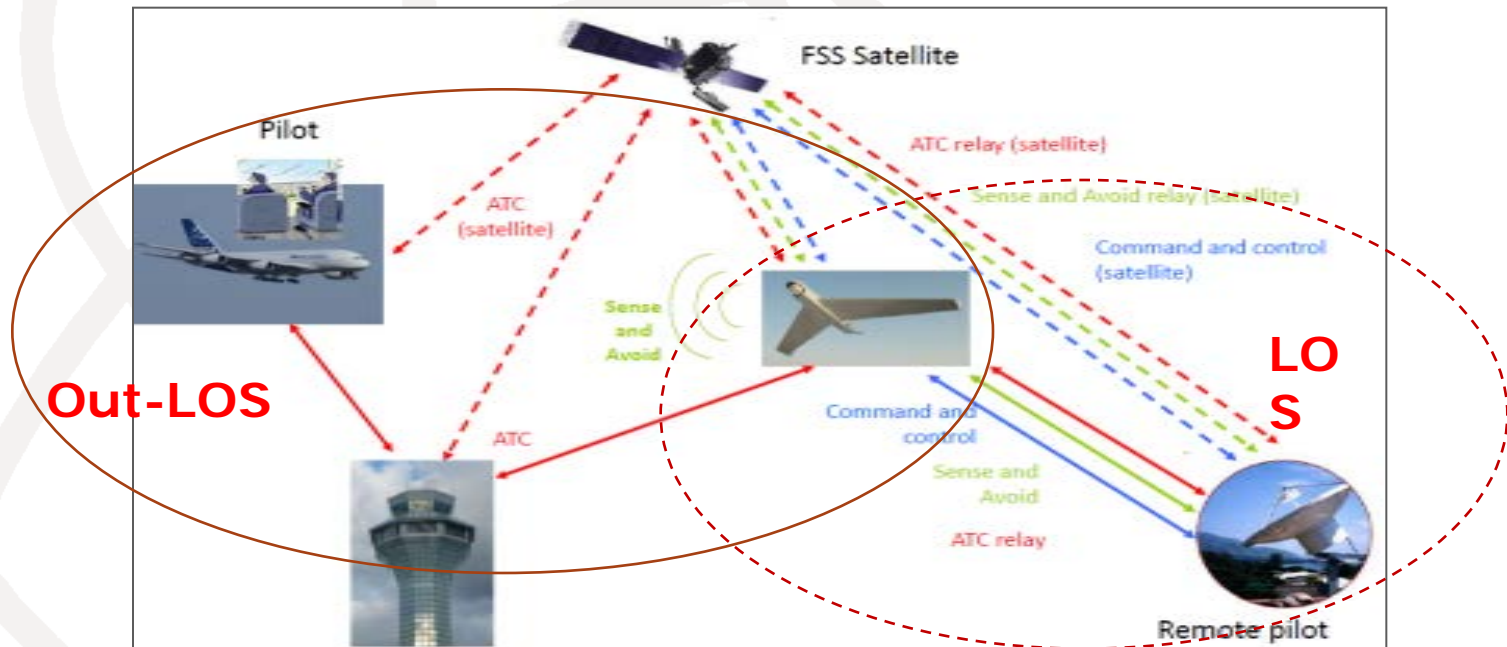
WRC-15 AI.GFT Decision



Seamless satellite based ADS-B – GFT - world wide



AI.1.5 - Unmanned Aircraft Systems (UAS) – Consider use of FSS bands for control and non-payload communications (CNPC) of UAS in non-segregated airspaces



- To identify conditions under which systems operating in the FSS could provide UA CNPC links
- No change, on the basis of concerns about the ability of FSS to provide a safety service



RES-155 (WRC-15) Regulatory provisions related to earth stations on board of **UAS** which operate with geostationary-satellite networks in the fixed-satellite service in certain frequency bands for the control and non-payload communications (CNPC) of UAS in non-segregated airspaces

UAS CNPC links will operate **in accordance with international *Standards and Recommended Practices and Procedures*** established *in accordance with the Convention on International Civil Aviation*

Free online access to ITU-R information



- World Radiocommunication Conference (**WRC**)
<http://www.itu.int/ITU-R/go/wrc/en>
- ***ITU-Radio Regulations @ 2012***
<http://www.itu.int/pub/R-REG-RR-2012>
- ***ITU-R Recommendations***
<http://www.itu.int/publ/R-REC/en>