
ITU

Small Satellites:

A Harmful Interference Threat ?

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Topics:

1. ITU Radiocommunication Sector
2. International Regulatory Framework and Procedures applicable to cases of Harmful Interference to Space Services
3. The Current Situation, Statistics, Typical Cases
4. Summary and Key Messages

Radiocommunication Sector

Main Strategic Goal → To ensure Free-Interference Operation

Why ? → To Maximize Quality and Availability of Service

→ To Prevent loss of investment, customers and revenue by minimizing unusable satellite capacity due to interference

→ To ensure a Successful Space Mission

How ? I. International Regulations (CS, CV, RR)

II. Global Standards & Guidelines
(to benefit from harmonization and economies of scale)

III. Assistance to administrations

ITU Constitution (1)

"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."

(Article 1, par.11)

ITU Constitution (2)

"All stations…must be established and operated in such a manner as not to cause harmful interference to the radio services…of other member states or recognized operating agencies or other duly authorized operating agencies, which carry on a radio service, and which operate in accordance with the provisions of the Radio regulations."

(Article 45)

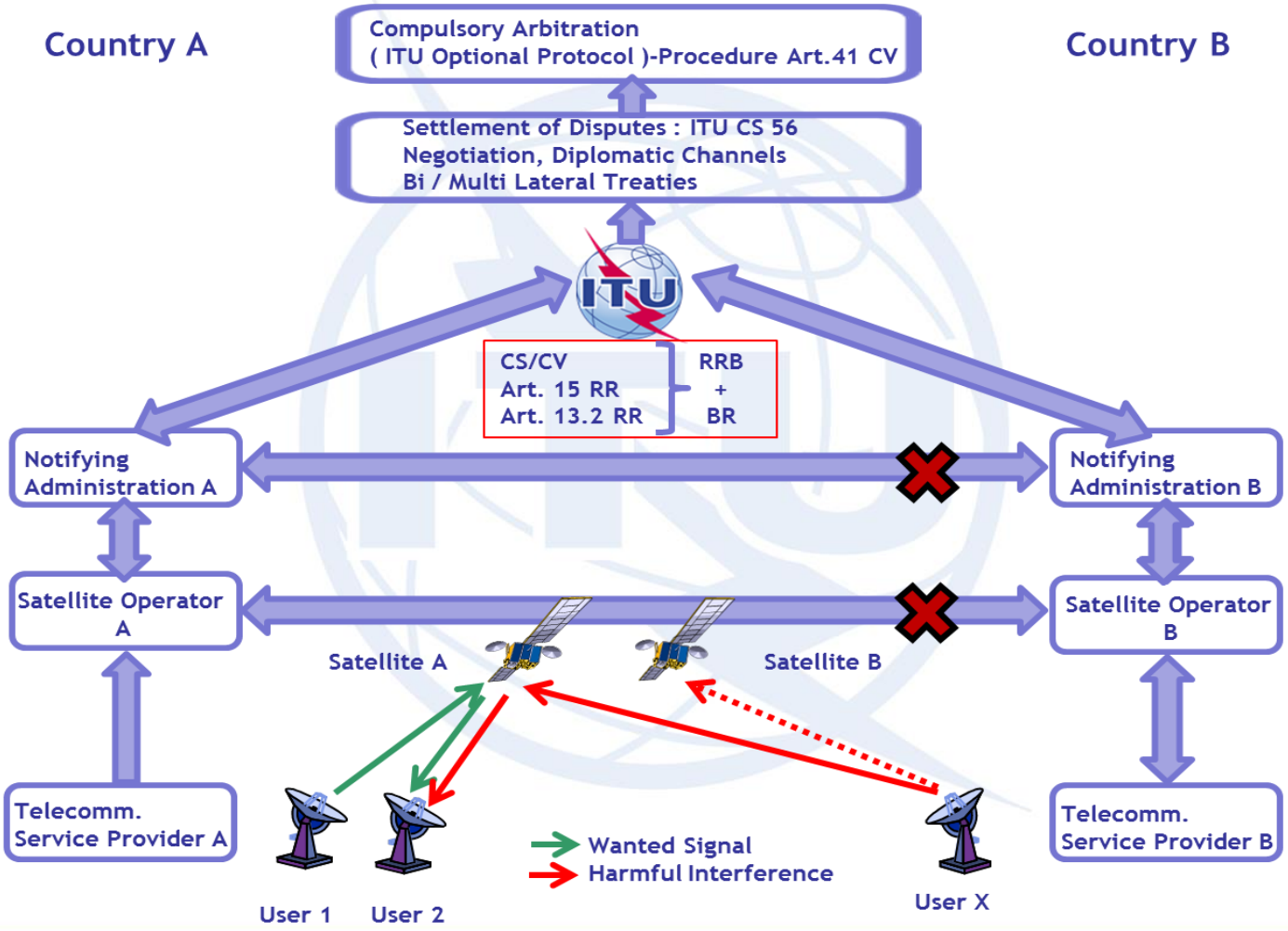
Harmful Interference in the Radio Regulations :

RR 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 (CS1003)."

- No Distinction between Deliberate/Intentional and Unintended Interference
- No specific level to define from Permissible Interference (RR1.167) to Accepted Interference (RR1.168) and then Harmful Interference
- No real Enforcement Mechanism apart from Art.56 CS and Optional Protocol
- As all Reg. Provisions, may be modified by ITU Member States through WRC, PP

Schema of Actions in case of Harmful Interference



How to Report a Case of Harmful Interference to ITU ?

I. To submit Letter to BR :

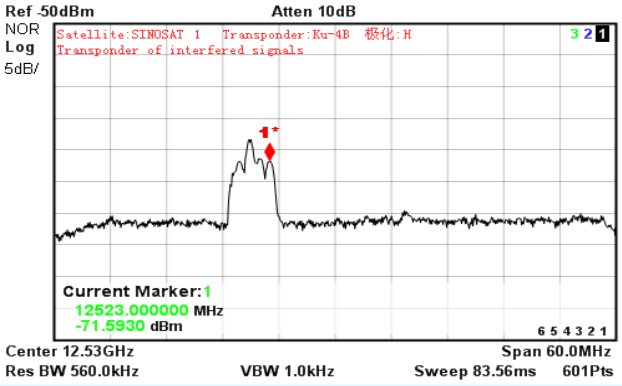
- For BR Information, or
- For BR Action, requesting Assistance under No 13.2 of Radio Regulations

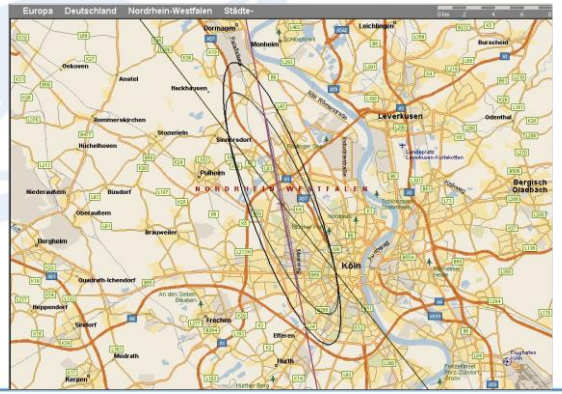
In both cases the information to be submitted is described in:

II. Appendix 10 to RR

III. ITU-R Report 2181

IV. If possible, Geolocation Information and Scan Plots





Source: ITU-R SG-1

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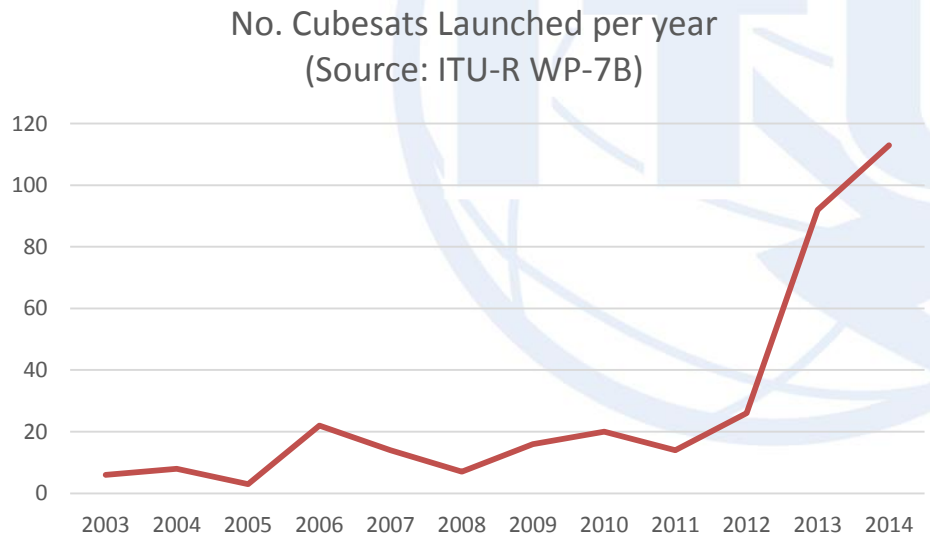
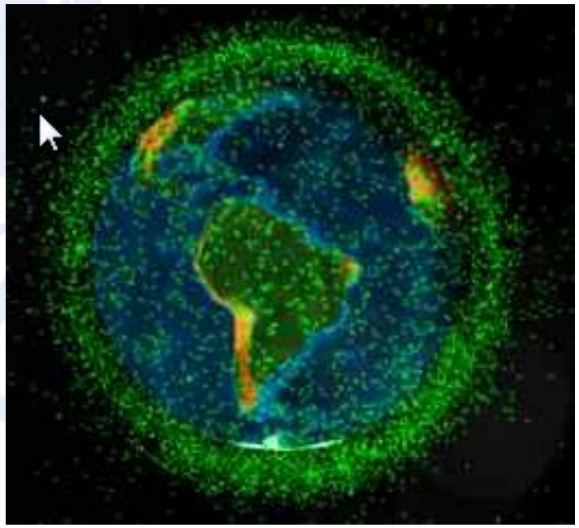
The Current Situation

- Number of Cubesats launched to space is increasing, as well as the Risk of Harmful Interference





Source: SDA

Cases of Harmful Interference to NGSO reported to BR

During 2012 to 2014, the following Space Services have been affected by several short or long time occurrences:

Service	Freq. Range
- Radio Navigation Satellite Service	1.2 GHz
- Earth Exploration Satellite Service	2.2 GHz
- Amateur Satellite Service (Infringement to Radio Regulations)	437 MHz

WRC-15 and Beyond

- WRC-12 decides on preliminary AI WRC-18

"2.2 to consider the appropriate regulatory procedures for notifying satellite networks needed to facilitate the deployment and operation of nanosatellites and picosatellites, in accordance with Resolution **757 (WRC-12)**;"

- Studies being carried out at ITU-R WP-7B
- To be Reported at WRC-15
- WRC-18 may introduce changes to Radio Regulations , bringing a more favourable scenario for small satellites

Summary and Key Messages (1)

- While Technology evolves constantly in response to human needs, Regulation follows technology.
- Tech. & Reg. are complementary tools to ensure free-interference operation.
- ITU Notification Procedures are simple and fast today, but there is room for improvements

Summary and Key Messages (2)

- No Threat of Harmful Interference as long as small satellites are planned, coordinated, notified and operated in accordance with ITU Radio Regulations:
  - Frequency Allocations (Article 5)
  - Power Levels (Articles 21 , 22)
  - [Coordination] and Notification (Art. 9, 11)

Thank You !