



**INTERNATIONAL
CIVIL AVIATION
ORGANIZATION**



ITU Regulations and Actions to protect the Global Navigation Satellite Systems (GNSS) from Harmful Interference

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International Civil Aviation Organization (ICAO)



- *The International Telecommunication Union (ITU) is the UN Specialized agency established to standardize and regulate international radio and telecommunications*
- *194 Member States*

Radio Regulations

International treaty

- Facilitate **equitable access** to and **rational use** of the radio frequency spectrum and the geostationary orbit
- Ensure **availability** and **protection from harmful interference** of frequencies for **distress and safety** purposes
- Assist in prevention and resolution of cases of harmful interference
- Facilitate efficient and effective operation of radiocommunication services
- Provide for, and regulate new applications of telecommunications technology



ITU World Radiocommunication Conferences

The highest level of Spectrum Management takes place at the ITU World Radiocommunication Conferences (WRC), held every four years

 The picture can't be displayed.

Maintenance of the International provisions for Spectrum Management, contained in the ITU Radio Regulations (RR)



This includes maintenance of the Table of Frequency Allocations



A consequence of this process is that aeronautical frequency managers need to develop, and lobby for an aviation position on frequency spectrum use





WRC History

Since 1906, the ITU World Radiocommunication Conferences provide spectrum and regulations for radio systems

WRCs promote and accommodate all wireless technologies

Aviation is only one of several spectrum users

Some WRC Decisions on Aviation Spectrum

1927	Aeronautical definitions
1938	HF AM(R)S allocations
1947	VHF and UHF ARNS and AM(R)S allocations
1963	First satellite allocations
1969	Plan for HF AM(R)S
1971	Exclusive AMS(R)S allocations 1.5/1.6 GHz
...	...
1997	Exclusive AMS(R)S allocations 1.5/1.6 GHz removed
...	...
2012	5 GHz ARNS allocation (MLS) repurposed for AM(R)S and AMS(R)S (RPAS C2-link and AeroMACs)
2015	Allocation for WAIC and Global Flight Tracking, Resolution 155 (FSS for C2 link placeholder)
2019	Averted need for prescriptive ITU regulations on GADSS
2023	Allocations for Space Based VHF and Wide-band HF, Resolution 155 suspended (FSS for C2 link placeholder)
2027	... maintain interference free operation of aeronautical Radio Altimeters ...

ITU Radio Regulations, Article 15 - Interferences

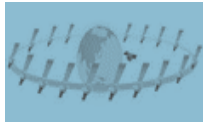
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ITU Space Services



194 Member States



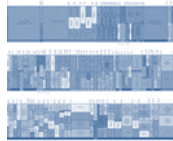
74 Members States
with access to Space Resources



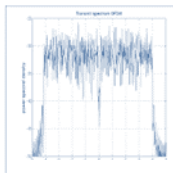
62 years of Space
Regulation



2640 Satellite
Networks Operating



6.8 THz of Spectrum
Coordinated and Recorded



99.89% Spectrum
Free of Harmful
Interference



< 0.1 % Interference Variation per
year

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
- ❑ Earth Exploration Satellite Service (passive) in 1400-1427 MHz band
- ❑ 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
- ❑ Radio Navigation Satellite Service (RNSS) in the 1164-1215 MHz and 1559-1610 MHz frequency bands

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Two types of sources of harmful interference affecting RNSS in the 1164-1215 MHz and 1559-1610 MHz frequency bands



1) Use of transmitting devices (jammers) without authorization

- The risk of impacting safety and regularity of flights is spread all over the world.
- It is not limited to areas near zones of armed conflicts



2) Military exercises or operations near zones of conflict

- Impact to safety and regularity of flights, maritime activity and time synchronization of telecommunications networks beyond the zone of conflict



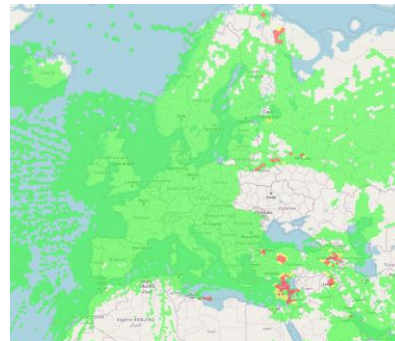
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Interference Evolution :

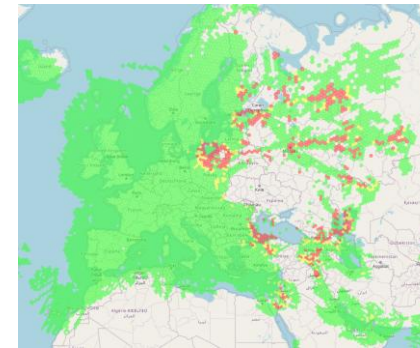


- ❑ Harmful interference increased significantly from 2019 to 2023
- ❑ It affected receivers onboard aircrafts and caused degradation or total loss of the service for passenger, cargo and humanitarian flights.
- ❑ ADS-B based system detected 127610 flights affected globally between 17.10.2022 to 19.06.2023 (8 months)
- ❑ Number of Reports received by ITU in 2024 are 5.25 times than the same period in 2023
- ❑ Main affected regions reported to ITU:

- Middle East
- North-East Europe (Baltic Sea)
- Black Sea Region
- Korean Peninsula
- Central Africa



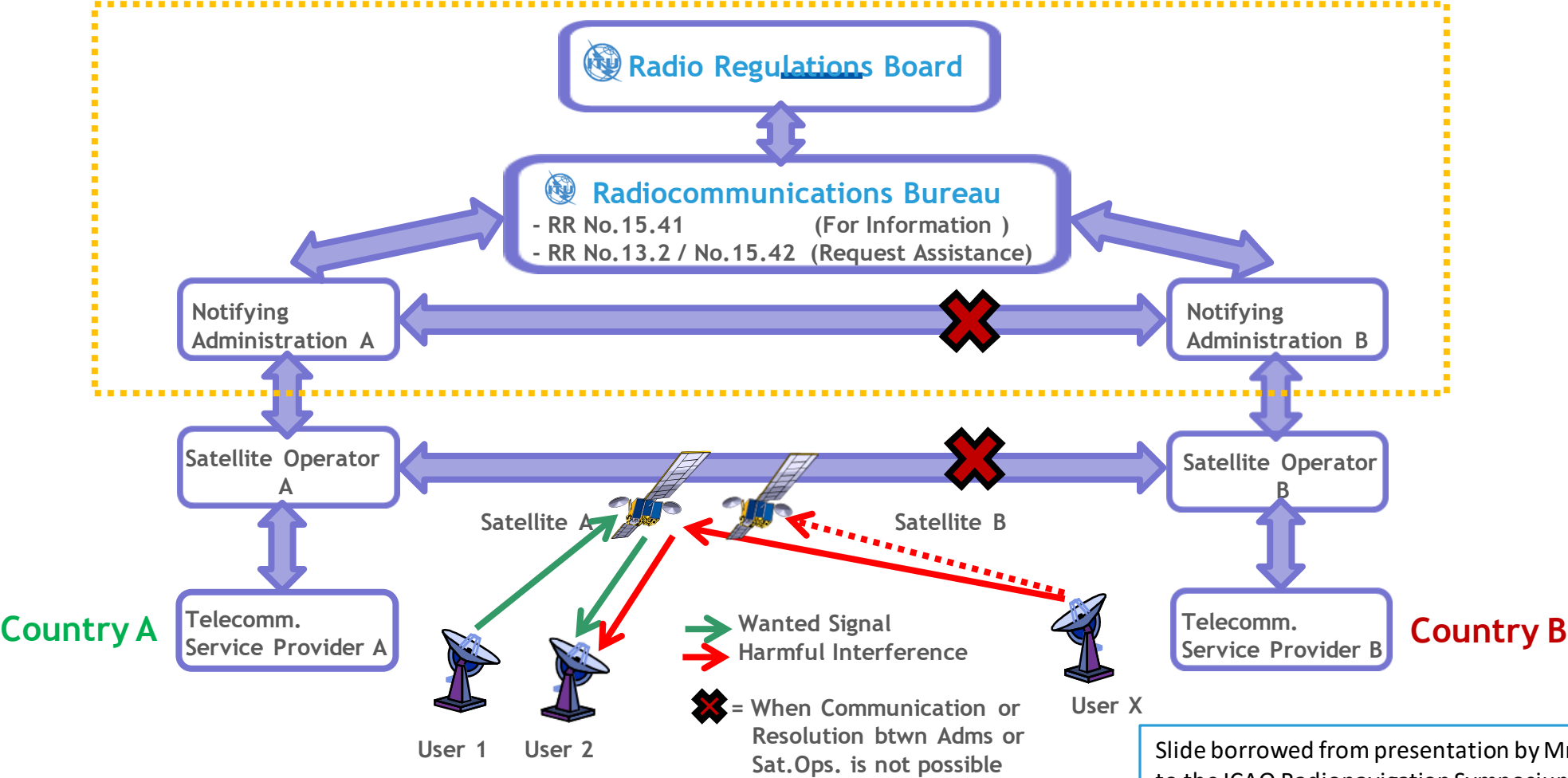
23 March 2022



23 March 2025

- ❑ 22 Administrations concerned and 4 Affected Satellite Systems: GPS, Galileo, Glonass, Compass

Process in case of Harmful Interference



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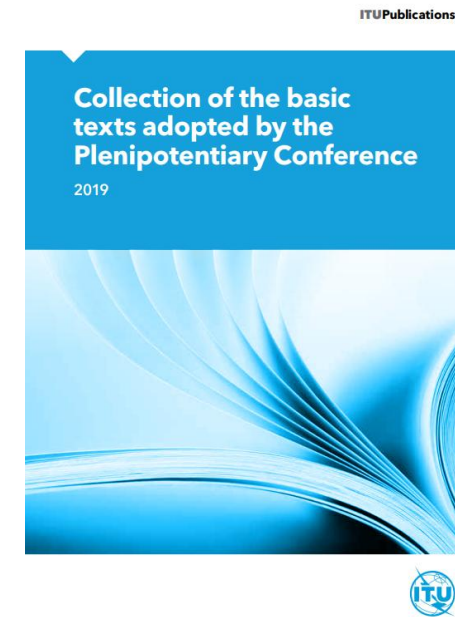
Key Regulatory Provisions

ITU Constitution



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- ITU CS Art. 45: All stations, whatever their purpose, must be **established and operated in such a manner as not to cause harmful interference** to the radio services or communications of other Member States or of recognized operating agencies, or of other duly authorized operating agencies which carry on a radio service, and which operate in accordance with the provisions of the Radio Regulations.
- ITU CS Art. 47: Member States agree to take the steps required to **prevent the transmission or circulation of false or deceptive distress, urgency, safety or identification signals**, and to collaborate in locating and identifying stations under their jurisdiction transmitting such signals.



Key Regulatory Provisions

ITU Radio Regulations



- ITU RR No. 15.1: All stations are forbidden to carry out **unnecessary transmissions**, or the transmission of **superfluous signals**, or the transmission of **false or misleading signals**, or the transmission of signals without identification
- ITU RR No.15.28: Recognizing that transmissions on distress and safety frequencies and frequencies used for the **safety and regularity of flight** (see Article 31 and Appendix 27) require **absolute international protection** and that the **elimination of harmful interference to such transmissions is imperative**, administrations undertake to act immediately when their attention is drawn to any such harmful interference



ITU-ICAO cooperation

- Approval of RESOLUTION 676 (WRC-23)

Due to the escalation of jamming and spoofing of GNSS observed in recent years, **aviation experts supported by ICAO expert groups developed a draft Resolution, which resulted in the approval of a new ITU Resolution RESOLUTION 676 (WRC-23) on the “Prevention and mitigation of harmful interference to the radionavigation-satellite service (RNSS) in the frequency bands 1 164 – 1 215 MHz and 1 559 – 1 610 MHz”.**

The Resolution urges administrations

1. **to apply necessary measures to avoid the proliferation, circulation and operation of unauthorized transmitters that cause or have the potential to cause harmful interference to RNSS systems.....**
2. **to take the following actions to prevent and mitigate harmful interference affecting the RNSS..... without prejudice to the right of administrations to deny access to the RNSS, for security or defence purposes:**
 - ...
 - 2.2 **to encourage cooperation between aeronautical, maritime and security authorities, as well as spectrum regulators, as appropriate, to address interference risks to RNSS systems that may stem from the activities of these security authorities;**
3. **to report cases, as the affected administration deems appropriate, of harmful interference to the RNSS...**



The resolution also refers to ICAO and relevant ICAO activities including reference to Assembly Resolution A41-8.

Resolution 676 (WWRC-23)

Urge Administrations:

3. To **report** to the Bureau cases of harmful interference affecting RNSS, in accordance with Article 15.



How to submit it ? :

by using ITU-BR SIRRS Online application →

<https://www.itu.int/en/ITU-R/space/SIRRS/Pages/default.aspx>



4. Bureau to provide **assistance** to Administrations under No 13.2 of Radio Regulations



Reporting GNSS RFI to ITU

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Space Services Department

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SIRRS

Satellite Interference Reporting and Resolution System

- As per Resolutin 55 (Rev. WRC-23) Reports of Harmful Interference affecting Space Services are to be submitted by SIRRS -

This online application has been developed by the Radiocommunication Bureau in response to Resolution 186 of ITU Plenipotentiary Conference 2014 with the aim to facilitate Administrations and space stakeholders to report a case of harmful interference affecting space services, to request assistance from the BR, to be informed in case a radio station under your jurisdiction is causing harmful interference to space services of other Administrations, and to exchange all necessary information among the concened parties involved in the case.

In order to be able to use the system, a user account must be open as indicated below:

Reporting

(ITU Registered Users)

 LOGIN

[I forgot my password...](#)

References:

[Short Video to Use SIRRS](#)



Thank You

