

Space Sustainability, Monitoring and Interference Reporting (SIRRS)

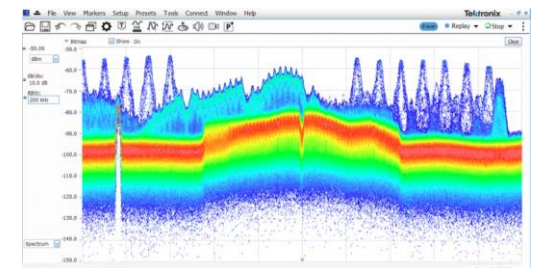
Jorge Ciccorossi
Space Services Department

2-6 December 2024, Geneva, Switzerland

1. Sustainability of Space Radiocommunications Systems
2. Why Space Radio Monitoring ?
3. Overview of the current situation and interference cases reported to BR
4. Procedure in case of Harmful Interference.
5. Use of SIRRS online application and ITU-R Recommendation for reporting

| Space Sustainability – Why ?

- ❑ Global Communications and Modern Infrastructure relies on Space Based Systems : GPS, Time Synchronization, Satellite Broadcasting, Mobile Devices, Monitoring of the Planet, Rural Communications
- ❑ Higher Demand, Acceleration in the Space Sector: Satellite Frequency Coordination Requests and Launches are growing exponentially
- ❑ Higher Risk of Interference and Physical Collisions in Space can degrade the efficiency and ultimately access to spectrum orbit resources



Space Sustainability – Why at ITU ?

- ❑ ITU Member States instructed SG, BR Director and ITU-R Sector to take a series of actions: Resolution 219 (PP-2022), Resolution 74 (RA-2023)
- ❑ 61 years of experience in regulating Spectrum-Orbit Resources (since 1st Space Conference in Geneva in 1963)
- ❑ Interrelation between the Space Environment and Efficient Use / Access to Spectrum-Orbit Resources (core responsibility from ITU)
- ❑ ITU provides the right balance across all regions and space sectors, giving a voice to governments as well as to the industry in a moment when the private sector is boosting space activities.



Space Sustainability – What's Done ?



2000+

Attendees
(online + in person)

90

Countries

53

C and Expert Level
Speakers

Governments | UN Agencies | Industry | Civil Society | Academia

**Space Policy and Law, Strategies, Spectrum, Deorbiting of
Spacecrafts, Space Situational Awareness, Space Programs**

Online Access to Resources about :

- Latest Space Strategies for Post Mission Deorbiting/Disposal
- Satellite Radio Monitoring
- Regulations, ITU-R Study Group Ongoing Work
- Space Environment Reports
- Satellite Catalogs and MIFR



Summary Report

Outcome and Next Steps



ITU

Circular Letter

CA/272



Space Sustainability – What's Next ?

❑ Exchange of information and Data Sharing

- Online directory with direct Points of Contact for flight operations
- Access to ephemeris data
- Facilitate communication between satellite operators worldwide

❑ Capacity building

- To leverage worldwide knowledge about space radiocommunications systems while raising awareness of basic safety rules in outer space

❑ Handbook – Recommendation on:

- Best Practices for the sustainable use of frequencies and associated non-GSO orbits by space radiocommunication services,
- Guidance on safe and efficient deorbit/disposal strategies and methodologies for non-GSO space stations involved in radiocommunication services after the end of their life

❑ 2nd. ITU Space Sustainability Forum: Planned for October 2025 !



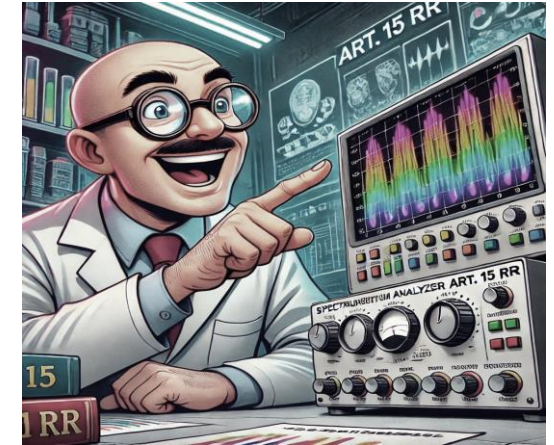
Why Space Radio Monitoring at ITU ?

To identify, geolocate and eliminate harmful interference to space services when Administrations request assistance from BR under No 13.2

“ if we cannot measure it, we cannot manage it ”

ITU Space Radio Monitoring Website

- Map with Technical Characteristics and PoCs for Monitoring Stations
- Recommendations, Reports
- Regulatory and Administrative Information
- Report ITU-R SM. 2182-1
- LIST VIII Article 16 → International Monitoring System
- Memoranda of Understanding signed with Germany, Pakistan, Korea, China, Vietnam, Belarus , Brazil, Oman and more joining soon



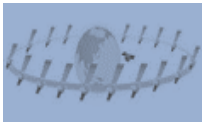
ITU and Space Services



194 Member States



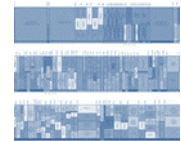
61 years of Space Regulation



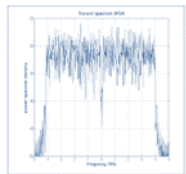
72 Members States with access to Space Resources



2600 Satellite Networks Operating



6.2 THz of Spectrum Coordinated and Recorded



99.86% Spectrum Free of Harmful Interference



< 0.1 % Interference Variation per year

Harmful Interference Reported to ITU



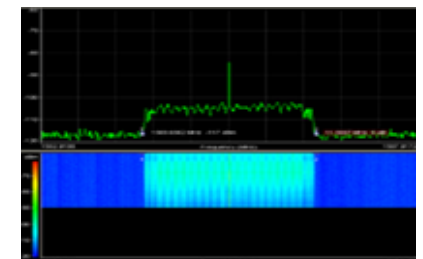
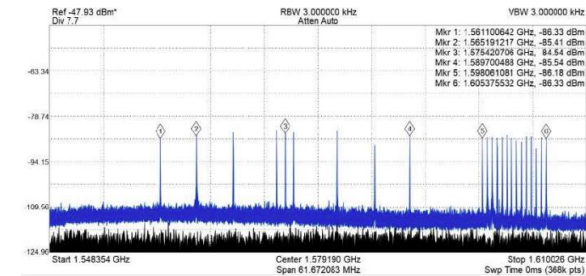
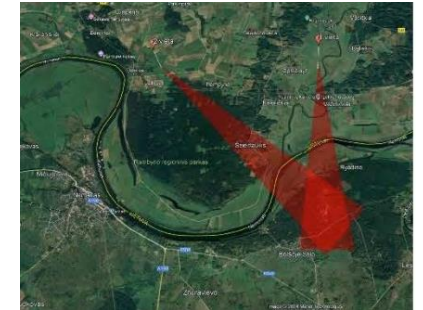
❑ Fixed Satellite Service, Broadcasting Satellite Service and associated Space Operations Functions in the frequency bands 6/4 GHz and 14-17-18/10-12 GHz

❑ 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

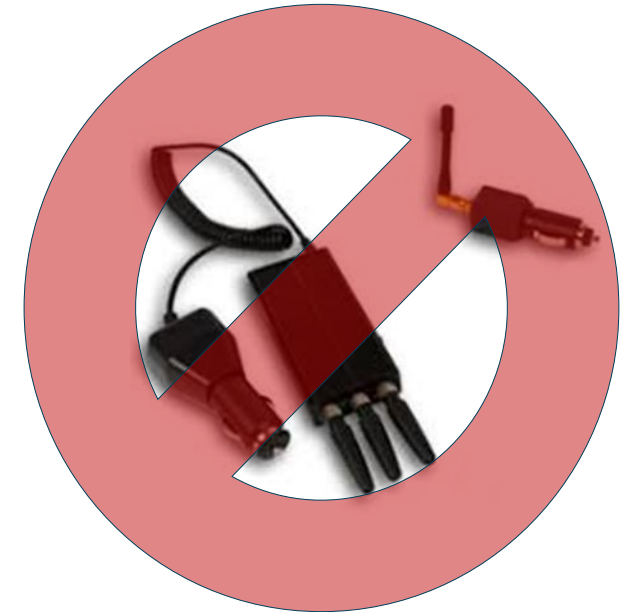


| WRC-23 Outcome to Protect RNSS

Adopted by consensus the [Resolution 676](#) on Prevention and mitigation of harmful interference to the radionavigation satellite service in the 1 164-1 215 MHz and 1 559-1 610 MHz frequency bands and Resolved to:

Urge 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



| WRC-23 Outcome to Protect RNSS

Urge Administrations:

2. **To take the following actions** to prevent and mitigate harmful interference affecting RNSS **without prejudice to the right of administrations to deny access to the RNSS, for security or defence purposes:**

2.1 To encourage **collaboration** between **spectrum regulators, enforcement authorities and RNSS stakeholders**, in particular in the **aeronautical and maritime** domains;

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;**



| WRC-23 Outcome to Protect RNSS

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 →

www.itu.int/en/ITU-R/space/SIRRS



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

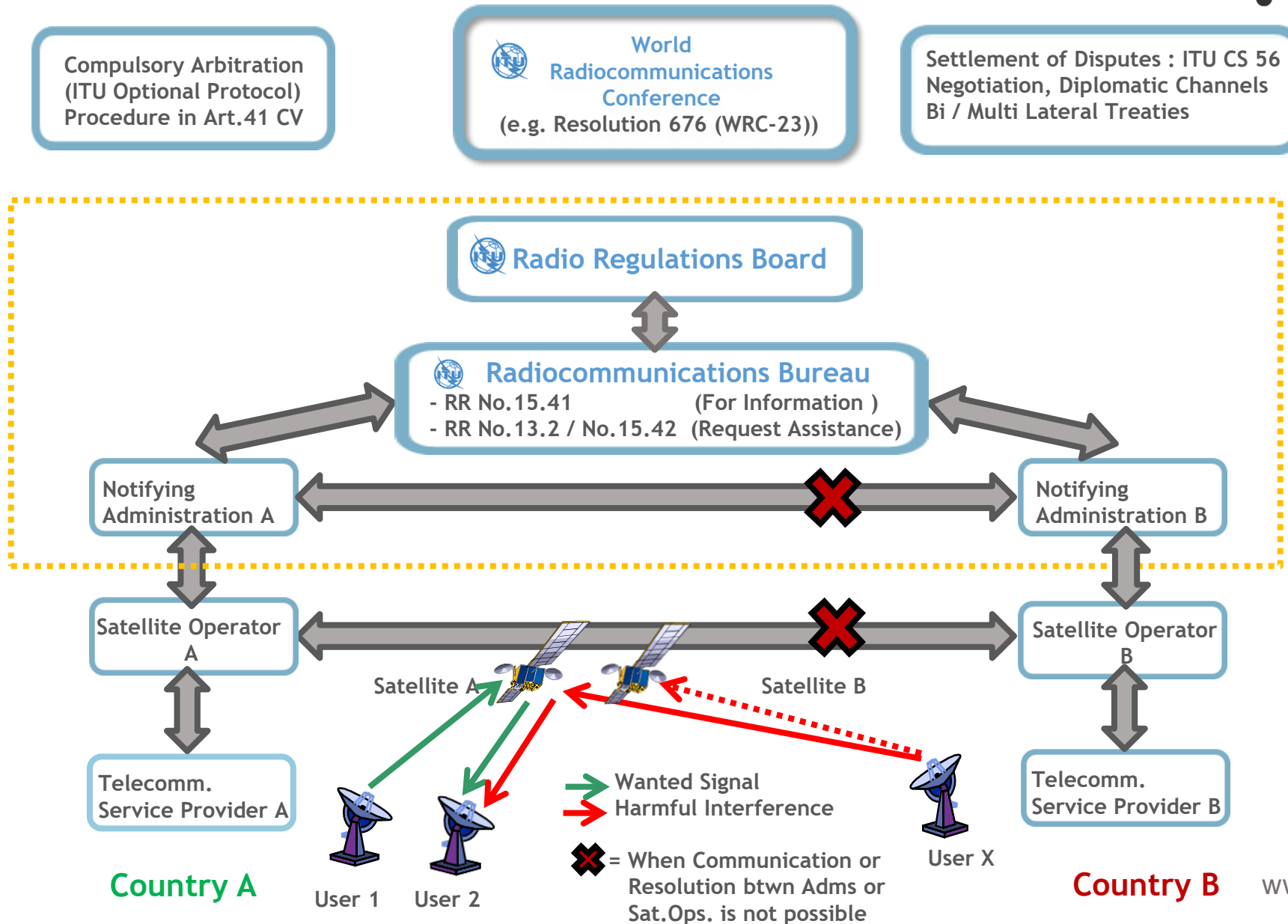
ITU-BR Actions for RNSS protection and Harmful Interference mitigation

Circular Letter CR/488

- Raised **awareness** of the increasing number of incidents around the world
- Recalled Member States of their **obligation to abide the Constitution and Radio Regulations** (CS Art 45, Art 47; RR No 4.10, 15.1, 15.28, Res 676 (WRC-23))
- Provided **recommendations** to prevent and mitigate the interference:
 - a) reinforcing systems **resilience** to interference;
 - b) increasing **collaboration** between spectrum regulators, aviation, maritime, civil-military and enforcement authorities;
 - c) **retaining essential terrestrial navigation** infrastructure for contingency support in case of RNSS outages, and developing mitigation techniques for loss of services



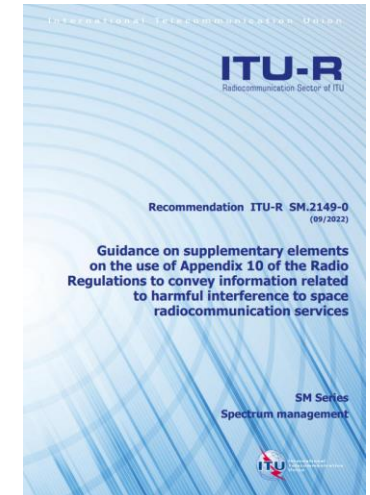
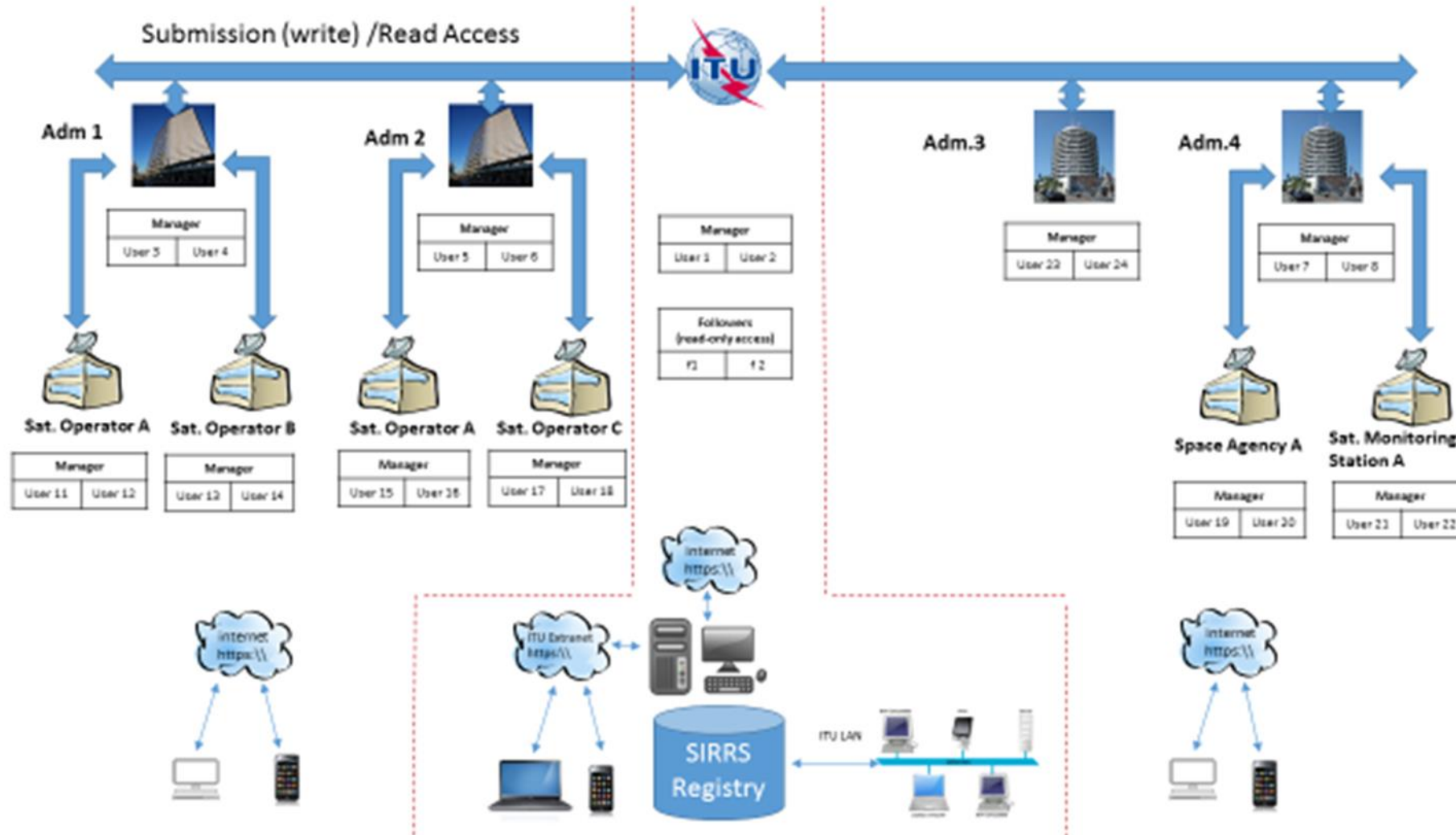
Process in case of Harmful Interference



Satellite Interference Reporting and Resolution System – SIRRS



[Play Video to learn
How to Use SIRRS](#)



[Guidelines for Reporting
REC ITU-R SM.2149](#)

Administrations shall use SIRRS: Res 55 (WRC-23) to report a case, reply and exchange information

To Open an Account:

1

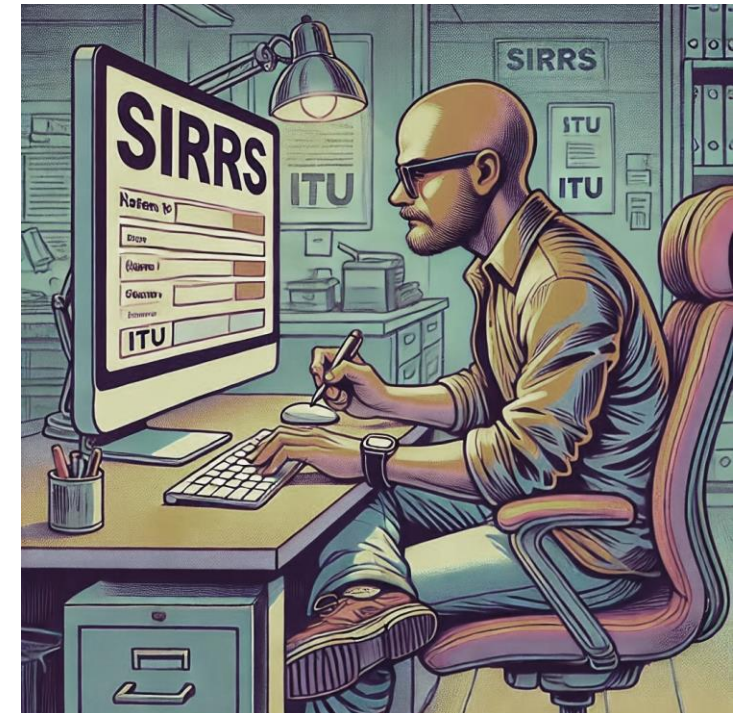
- **Administration send letter to BR by**
- E-communications, or
- BRMail@itu.int , or
- FAX: +41 22 730 5785

2

- **Requests to assign Role of Administration Manager for:**
- Full Name
- TIES USER
- Email address

3

- **Administration Manager** signs in and **add other users** through SIRRS



SIRRS – Create a New Report



Create New Interference Report

← Back to drafts Save draft

***mandatory element**

Report information Ref.: Not applied

Title:

Ref. Administration:

Stations Causing Interference

1 + Add Station

Stations Interfered With

Interfering Scenario: 2

Station type	Earth	<input type="text"/>	<input type="text"/>
Direction	TX	<input type="text"/>	<input type="text"/>

Station type	Space > Geo stationary	<input type="text"/>	<input type="text"/>
Direction	RX	<input type="text"/>	<input type="text"/>

Frequency Assignments

3 + Add frequency assignment

Upload documents

Letter from Affected Administration: Upload

Interference Signal Geolocation Plot: Upload

Interfered and Interfering Signal Scan Plots: Upload

Information on Passive Sensors-EES (REC ITU-R RS.1(RF)-SENSOR_REPORTING): Upload

+ Add additional document

1) Station Causing Interference

2) Interference Scenario:

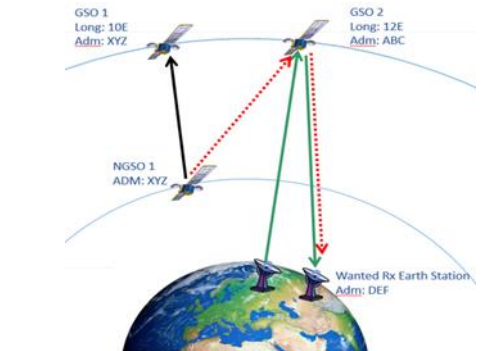
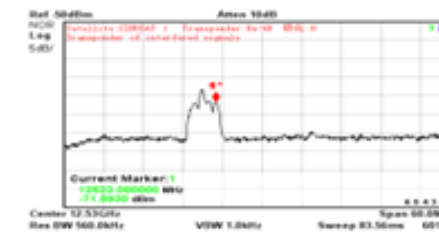
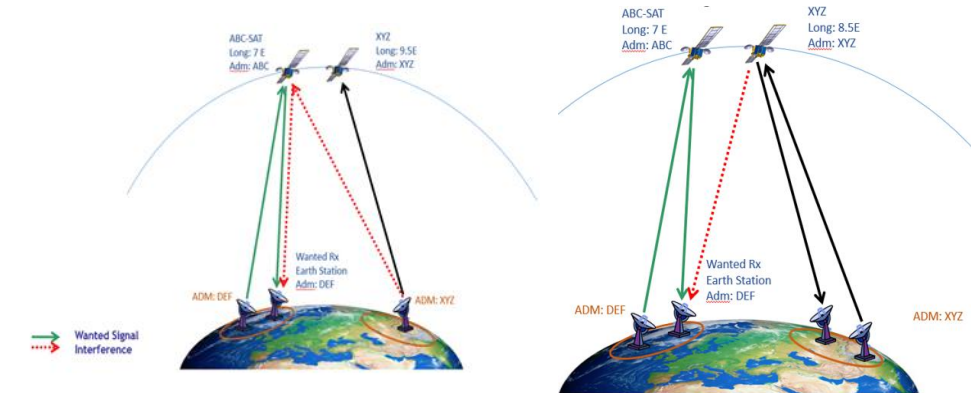
- Earth to Space
- space to Earth,
- Radio Astronomy,
- EESS-Passive,
- intersatellite links,
- NGSO to GSO

and Characteristics of Station Interfered with

3) Affected Frequency Assignment(s)

4) Upload Documents:

- Correspondences
- Scan Plot
- Geolocation Plot
- Other Forms, Graphs, Analysis, etc
- Info on Passive Sensors in the Format of REC.ITU-R RS 2106-0



SIRRS-Select Stations, Upload Data, Submit Report



1 Interfering Station

Add Station Causing Interference

Characteristics

Station type: Earth


Name [q]:

Class of Station [q]:

Location [h]

Longitude: 0.0456705414

Latitude: 11.3829798470



Description:

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Administration(s) having jurisdiction*

Measured Characteristics:

Frequencies [q]: MHz

Class of Emission [q]:

Bandwidth [q]: MHz

Field Strength or Power Flux Density of Interfering Carrier [q]:

Polarization [q]: Other

Additional Information

Date and Time (UTC) of Interference [b,s,e]*:

Nature of Interference [u]:

Type of carrier: ☐ Analog Modulated Carrier ☐ Burst Signal ☐ CW - Clean Carrier ☐ Digital Modulated Carrier ☐ Frequency Hopping ☐ Frequency sweeping

Source: ☐ Cross Polarization ☐ Co-Channel ☐ Intermodulation ☐ Unwanted emissions ☐ Antenna mispointing ☐ Adjacent Satellite Interference ☐ Adjacent Carrier Interference ☐ Malfunctioning equipment ☐ Insufficient cable shielding ☐ Reference to RR No.15.1 (unnecessary emissions) ☐ Other (please specify)

Facility which made the above measurements [i,p]:

Longitude:

Latitude:

2 Affected Stations

Add Station Interfered With

Characteristics


Name [i]:

Associated Administration*: Select

Location [o]*

Longitude: 10.490037557958317

Latitude: 44.54918605165711



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2

Add Station Interfered With

Characteristics

Station type: ☒ Geo-stationary satellite ☐ Non geo-stationary satellite

Name [q,i]:

Associated Administration*: Select


Associated ITU Satellite Name*: Select

Associated Downlink Frequency: MHz

Associated Downlink Polarization: Other

Location [o]*

-27.554613773098254



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3 Affected Freq. Assignment

Add Affected Frequency Assignment

Assigned frequency [k, l]*: MHz

Bandwidth [n]*: MHz

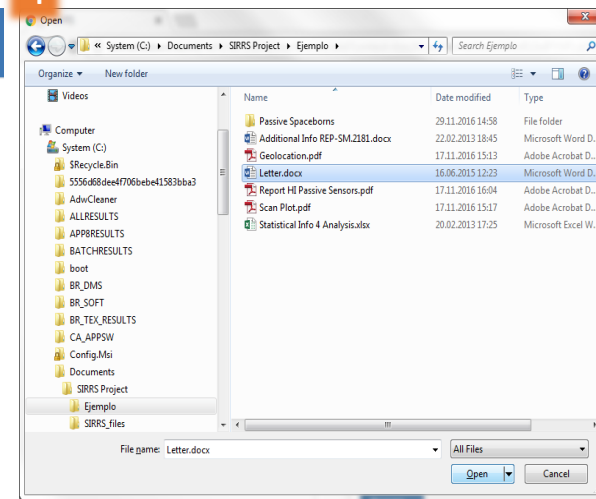
Polarization [w]: Other

Nature of Service*: Select

Class of emission [m]:

Field Strength or Power Flux Density of Wanted carrier [v]:

4



Purpose: BR Information (no BR Action) or Assistance from BR

5

Requested Action

- ☒ To inform the Concerned Administrations and the Bureau (No. 15.34, No 15.35, No.15.41)
- ☐ To request Assistance from the Bureau (No.13.2, No 15.42)

Availability

- ☐ Authorize Public Access

Approve and Submit

Reject

Subsequent updates or Replies : Upload Documents

6

Report Reply 0

Add additional document

In Summary, we learnt on the need of :



1. Making a Responsible use of Space (spectrum and orbits)
2. Monitoring, Reporting and Cooperating in Interference Resolution
3. Protecting Radio Navigation Satellite Service
4. Using SIRRS