Informal Panel Discussion – UN OEWG PAROS
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United Nations | Office for Disarmament Affairs



Protection of Space-Based Services to Civilians

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ITU and the Space Sector:

194 Member States

+1000 Private Sector Members

+150 Academia Members

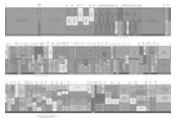
+ 62 Years Regulating

Spectrum-Orbit Resources

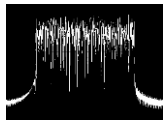
ITU Space Sustainability Forum

+ 2700 Satellite Networks/Systems Notified and Operating

+ 4000 Satellite Networks/Systems under process of Coordination/API



6.8 THz of Spectrum Coordinated and Recorded



99.89% Spectrum Free of Harmful Interference

ITU Space Sustainability Gateway

Why Space Resilience and Sustainability to protect space-based services to civilians?

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.

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.

Facilitates communication and data sharing among space stakeholders

To ensure sustainability of space radiocommunication systems



2 Main Challenges Today:

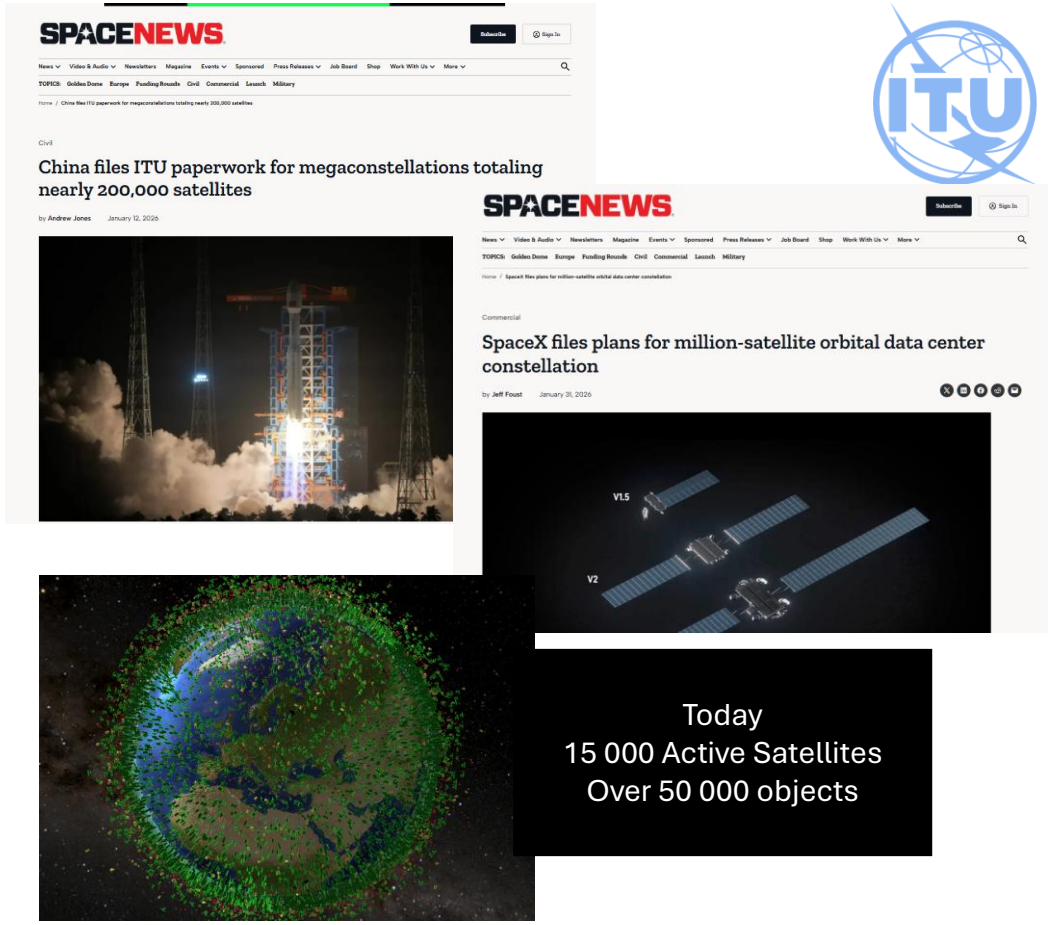
1-Expansion of Satellite Systems in Low Earth Orbit (increasing complexity)

a) Spectrum Sharing

→ Under Control through ITU WRC process & Radio Regulations

b) Space Environment and Traffic Management/Coordination

→ TBD - Lack of similar International Treaty to govern it



2-Deliberate Radio Frequency Harmful Interference

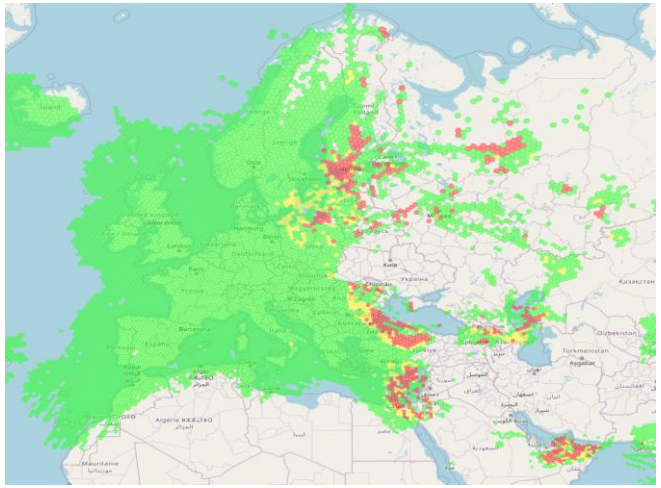
a) Earth to Space

b) Space to Space

c) Space to Earth



e.g: jamming and spoofing to Radio Navigation Satellite Services (GPS, Galileo, etc)



2 Strong Pillars:

Security, Safety and Sustainability of

Space Radiocommunications Systems



International Regulatory Framework

Cooperation

Diplomacy

Technological Innovation

Deploying resilient and

sustainable systems by design

How ITU is Responding to these 2 challenges:

Spectrum Domain – Interference :

Preventive Measures:

-Study Groups

-World Radiocommunications Conferences every 3-4 years

-Application of the Radio Regulations:

Allocation of Frequency Bands and services, Power Control

Coordination and Recording in MIFR

Corrective Measures:

-Articles 15: Reporting Harmful Interference

-Article 13.2: Providing Assistance to ITU Members

-Article 16: International Monitoring System

(PP RES186 on TCBM Outer Space)

Space Environment:

Prevention of Physical Collision and Space Debris

Facilitating Communication and Data Sharing among Operators

Monitoring NGSO Deployment and compliance with orbital tolerances

Providing Transparency and Certainty with respect to parameters notified to ITU

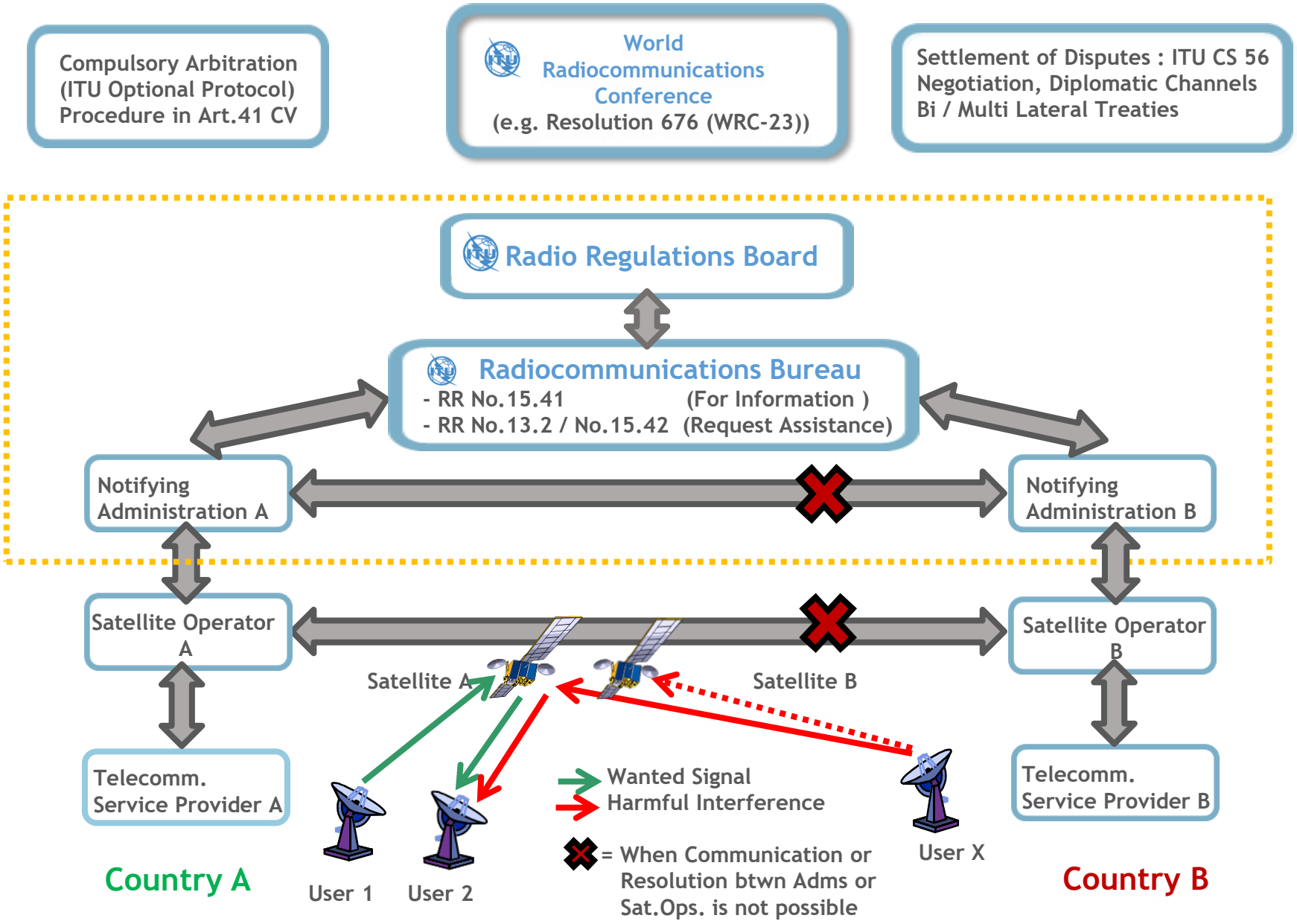
Online Space Toolkit

Discussion Forum and Capacity Building

Development of Handbook and Recommendations (Standards)

e.g.: Recommendation ITU-R S.1003-2 on Environmental protection of the geostationary-satellite orbit

Process in case of Harmful Interference



Harmful Interference (Deliberate)

ARTICLE 45 ITU Constitution:

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 Radio Regulations 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

Military Radio Installations:

ARTICLE 48 ITU Constitution

Installations for National Defence Services

Member States retain their **entire freedom with regard to military radio installations**. **Nevertheless**, these installations must, so far as possible, observe statutory provisions to the measures to be taken to **prevent harmful interference**.



WRC-23 Resolution 676

Prevention and mitigation of harmful interference to the radionavigation satellite service in the frequency bands 1 164-1 215 MHz and 1 559-1 610 MHz

...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

In Summary:

- Civil Sector strongly depends on space services and associated infrastructure
  (e.g. telecommunications, earth exploration, radionavigation, timing)

- Stations should be operated in such a manner to prevent causing harmful interference

- Responsible use of spectrum-orbit resources is critical to ensure space safety, security and sustainability



Thank You !

Annex: additional information about ITU Toolkit for Space Sustainability

ITU Space Sustainability Forum



- 6000 + Attendees (in person + online and offline)
- 143 Countries
- 60 + C Level and Expert Speakers
- Governments, Satellite Operators, Space Agencies, UN Agencies, Industry, Academia, Civil Society



➢ 1st Edition: Identified needs for action

1-Data Sharing

2-Awareness and Education

3-Regulatory Framework

4-Technical Solutions

5-Partnerships

www.itu.int/SSF

➢ 2nd Edition: Followed-up on progress and Outputs Delivery

1- ITU publishes Directory with Points of Contact for Satellite Operations

2- ITU releases Argus online application to visualize NGSO Large Constellations Deployment and associated orbital tolerances in accordance with Resolution 8 WRC-23.

3- ITU Space Connect and SSF series of educational sessions.

4- SSA, Global Space Traffic Coordination and NGSO Spectrum Monitoring tools presented by the Industry

5- Updates on Regional and National Space Laws

6- Communications and networking facilitated among key Space Stakelholders

7- Insightful discussions on latest innovations and next challenges.

Space Sustainability Gateway

Quick Points of Contact

- Administrations
- Satellite Operators / Space Agencies
- Contact Us / Suggestions

www.itu.int/space-sustainability/

Policies

Guidelines,
Codes of Conduct and
Best Practices *

Strategies for post mission Deorbiting or Disposal of spacecrafts

by Administration, Organization and Satellite System (Responses to CA/272) *

Spectrum

ITU Master International Frequency Registry

(MIFR)

ITU Space Radio-Monitoring

Regulatory

ITU-R Resolution 74
(RA 2023)

ITU PP Resolution 219
(Bucharest 2022)

ITU Circular Letter
CA/272

Ongoing Work
ITU-R Study Group 4

Resources on Space Environment:

Online Satellite Catalogs

Collision Avoidance

Environment Reports
ESA's Space Environment Report 2023

Environmental protection of the geostationary-satellite orbit
(Recommendation ITU-R S.1003-2)

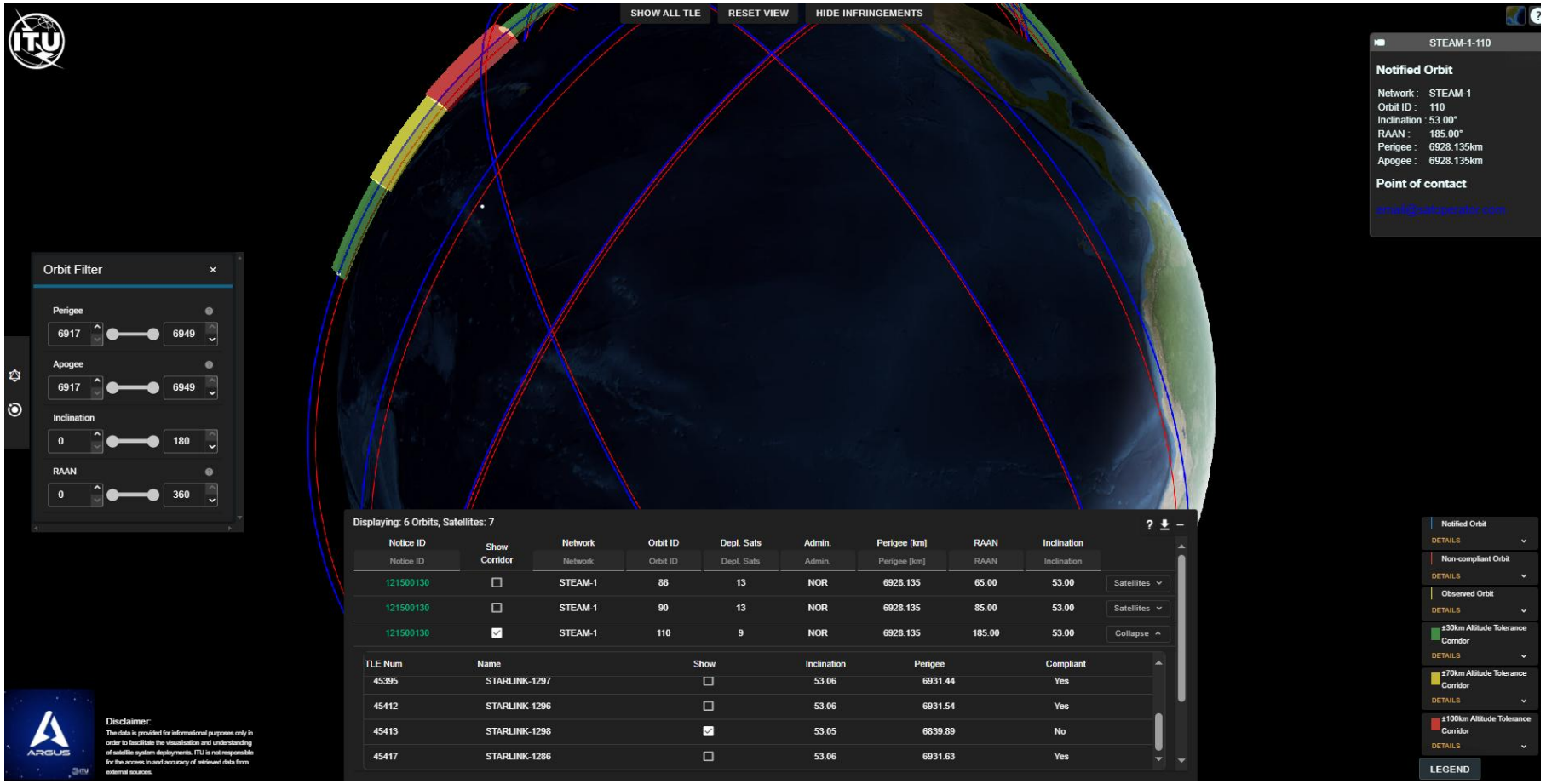
Space Debris – UN Inter-Agency Meeting Special Report to COPUOS
Section K related to ITU

Long-term Sustainability of Outer Space Activities – UNOOSA Information Repository

ARGUS by ITU

To visualize NGSO Deployment and Orbital Tolerances under WRC-23 Resolution 8

- ✓ Notified vs Observed orbital parameters
- ✓ Filters by satellite system, apogee, perigee, RAAN, inclination, frequencies
- ✓ Download List
- ✓ Potential Infringements
- ✓ Satellite Operator Direct Point of Contact
- ✓ Linked to Space Explorer for Milestones Status and frequency assignments in MIFR



ITU-R Study Groups actions on Space Sustainability

ITU Radiocommunications Assembly adopted by consensus Resolution 74 (RA-23) :

1) to develop and finalize during the next study cycle a Handbook on best practices for the sustainable use of frequencies and associated non-GSO orbits by space radiocommunication services, including individual experiences and guidelines adopted by Member States and Sector Members



2) to conduct studies towards the development of a new Recommendation providing guidance on safe and efficient deorbit and/or disposal strategies and methodologies for non-GSO space stations involved in radiocommunication services after the end of their life, focusing on the radio-frequency spectrum and associated satellite-orbit resources used by space services,



Work ongoing at WP-4A