

**TELECOMMUNICATIONS AUTHORITY
OF TRINIDAD AND TOBAGO**

**INTRODUCTION TO SPECTRUM MANAGEMENT
AND
KEY OUTCOMES FROM THE
WORLD RADIOCOMMUNICATION CONFERENCE 2023 (WRC-23)**

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Outline

- ✓ The Telecommunications Authority of Trinidad and Tobago (TATT) Mandate
- ✓ TATT's Spectrum Management Mandate
- ✓ What is the electromagnetic spectrum?
- ✓ Aim of Spectrum Management
- ✓ High-Level Spectrum Management Processes
- ✓ Spectrum Planning
- ✓ Licensing
- ✓ Spectrum Monitoring
- ✓ Key Outcomes for World Radiocommunications Conference, 2023 (WRC-23)

TATT's Mandate

Creating an Open Telecommunications Market

With Conditions for Fair Competition

Ensuring the Orderly Development of Telecommunications

To safeguard, enrich and strengthen society's social, cultural and economic well being

Protecting and Promoting the Public Interest

Accessibility

Affordability

Quality of Service

Facilitating Universal Access to Telecommunications

Encouraging Investment in Telecommunications

Regulating Broadcasting Services



TATT's (Spectrum Management) Mandate

Telecommunications Act Chap 47:31 –

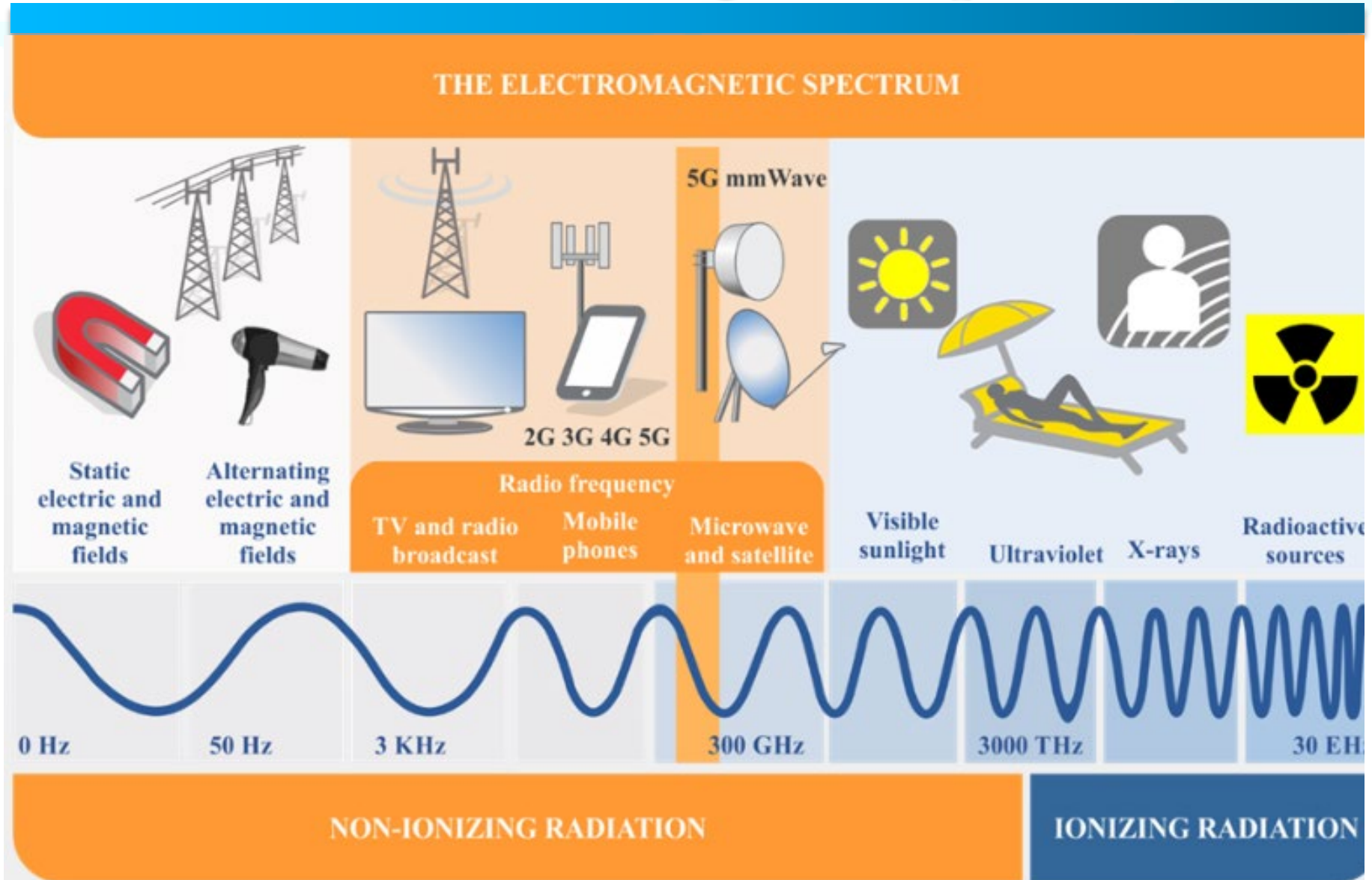
- Part II:
 - Section 18 – Authority's powers and functions to plan, supervise, regulate and manage the use of the radio frequency spectrum.
- Part IV:
 - Section 36 to 39 – Licensing (Authorisation)
 - Section 40 to 43 – Spectrum planning
- Part V:
 - Section 45: establishing preferred technical standards for equipment
- Part VI:
 - Section 46: Authority's inspection powers for a concessionaire or licensee to provide information, on its network and service, including equipment operation

TATT's Mandate (cont'd)

Telecommunications Act Chap 47:31 –

- Part X:
 - Section 75: establishment and operation of spectrum monitoring stations
 - Section 76: mitigation of harmful interference
 - Section 78: regulations, as may be required, for the management of spectrum

What is the Electromagnetic Spectrum?



ITU EMF Guide - version 1.1 **Figure 1 - The electromagnetic spectrum**

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Aim of Spectrum Management

Spectrum Management

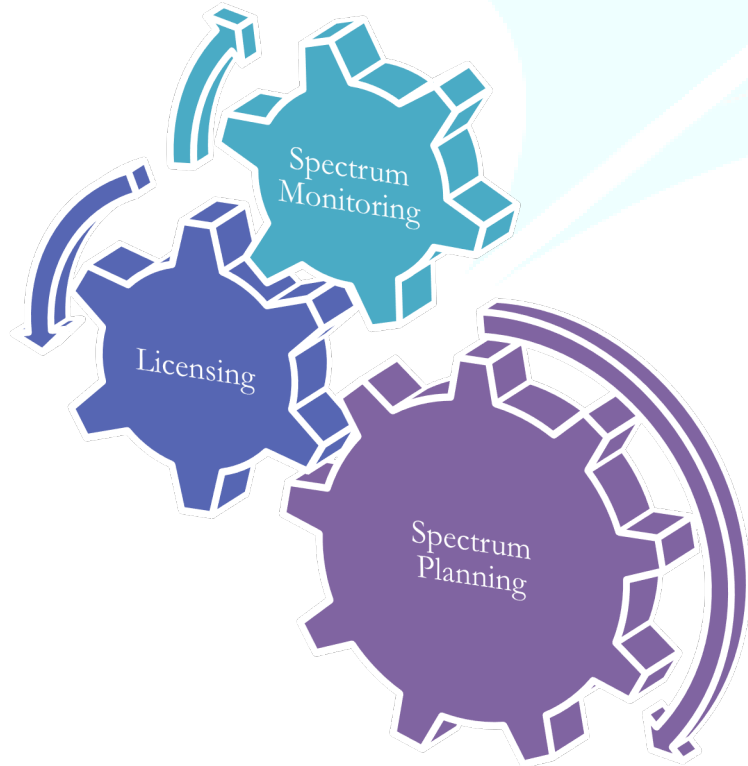
Spectrum, in spectrum management, means the continuous range of electromagnetic wave frequencies used for telecommunications.

Spectrum management aims to make the radio frequencies available for use in wireless devices to stimulate social and economic progress; and make efficient and effective use of the spectrum.

Spectrum Management Hierarchy



High-Level Spectrum Management Processes



Spectrum Planning

Establishment of the guidelines, rules, and procedures for the assignment and use of spectrum, along with coordination and in consultation with stakeholders, where applicable.

Licensing

The process of assigning spectrum or spectrum-related resource (call-signs) to users under specified terms of use, in accordance with the relevant spectrum plan, for a finite time-period and fee, where applicable.

Spectrum Monitoring

The proactive or reactive conduct of field measurements and/or inspections to confirm the terms and conditions of use of authorized spectrum and to take action against unauthorized use of spectrum.

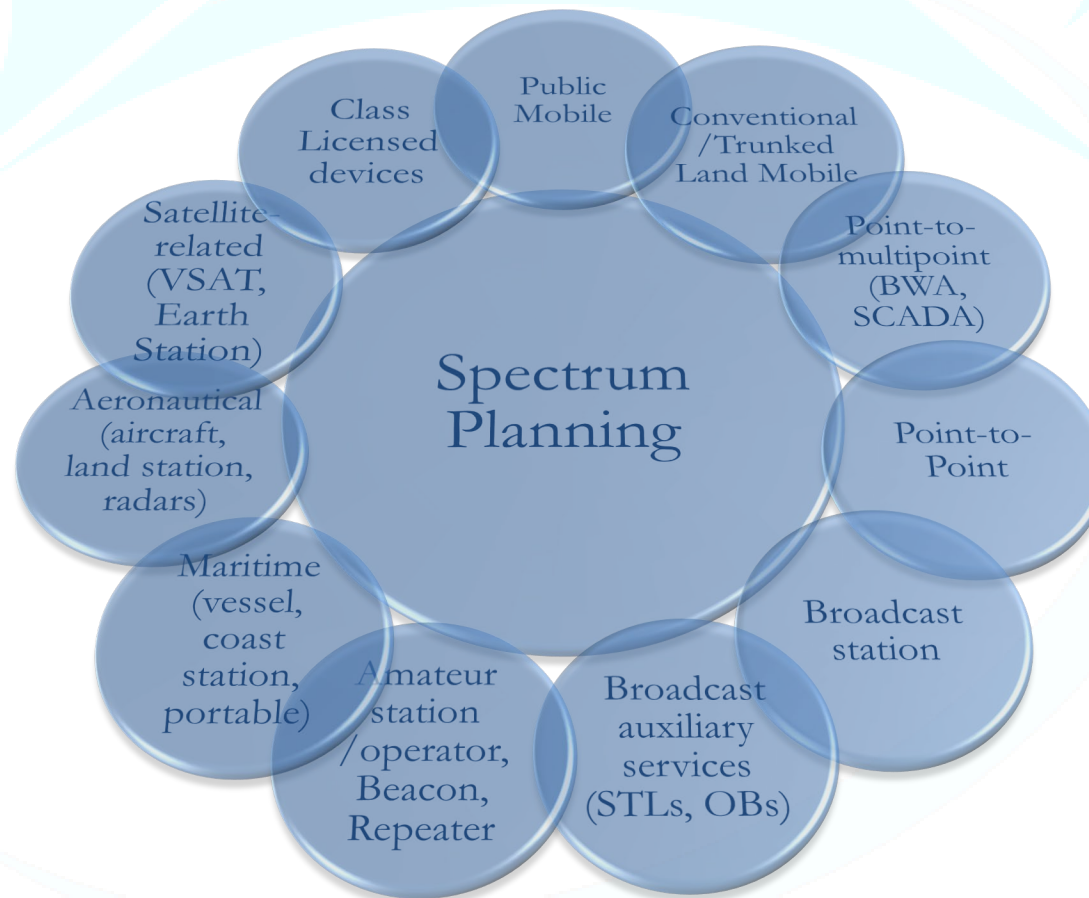
To confirm spectrum availability to inform planning and licensing.

Spectrum Planning

Spectrum Planning Ecosystem: Inputs



Spectrum Planning (Radiocommunications Systems) Ecosystem: Outputs



Spectrum Planning Documents



TATT Website: www.tatt.org.tt



Licensing

Types of Licences



Spectrum
Licence



Station
Licence



Class
Licence

Licensing Approaches

Competitive
authorisation
process:

- Comparative evaluation
- Auction
- Lotteries
- Hybrid (pre-qualification followed by auction or lottery)

First Come
First Served

Spectrum Monitoring

Spectrum Monitoring Plan

Spectrum monitoring informs the following key functions:

- spectrum planning and management
- licensing
- interference complaint handling
- consumer complaint handling (quality of service and coverage complaints)
- compliance and enforcement (in relation to spectrum use)

Spectrum monitoring is also used to:

- confirm licensees' operations are in accordance with the technical schedule of their licences
- determine spectrum utilisation in specified bands both authorised and unauthorised use
- verify information related to wireless concessionaire obligations such as quality of service and coverage

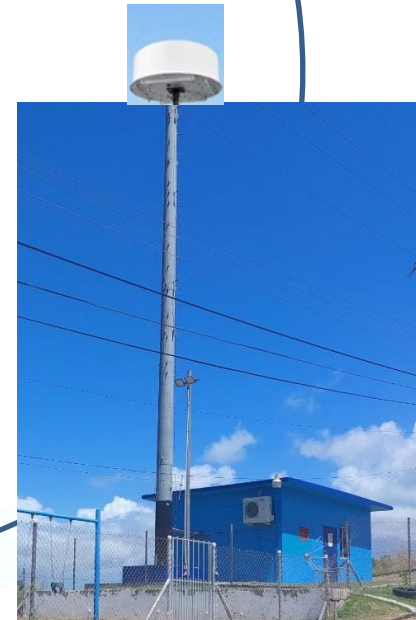
Spectrum Monitoring System

Two spectrum monitoring vehicles monitors 20 MHz to 8000 MHz



Head Office remote monitoring

Handheld spectrum analyser monitors 100 kHz to 3 GHz



Fixed monitoring sites at Mt Hope, Sevilla and Tobago monitors 20 MHz to 3000 MHz

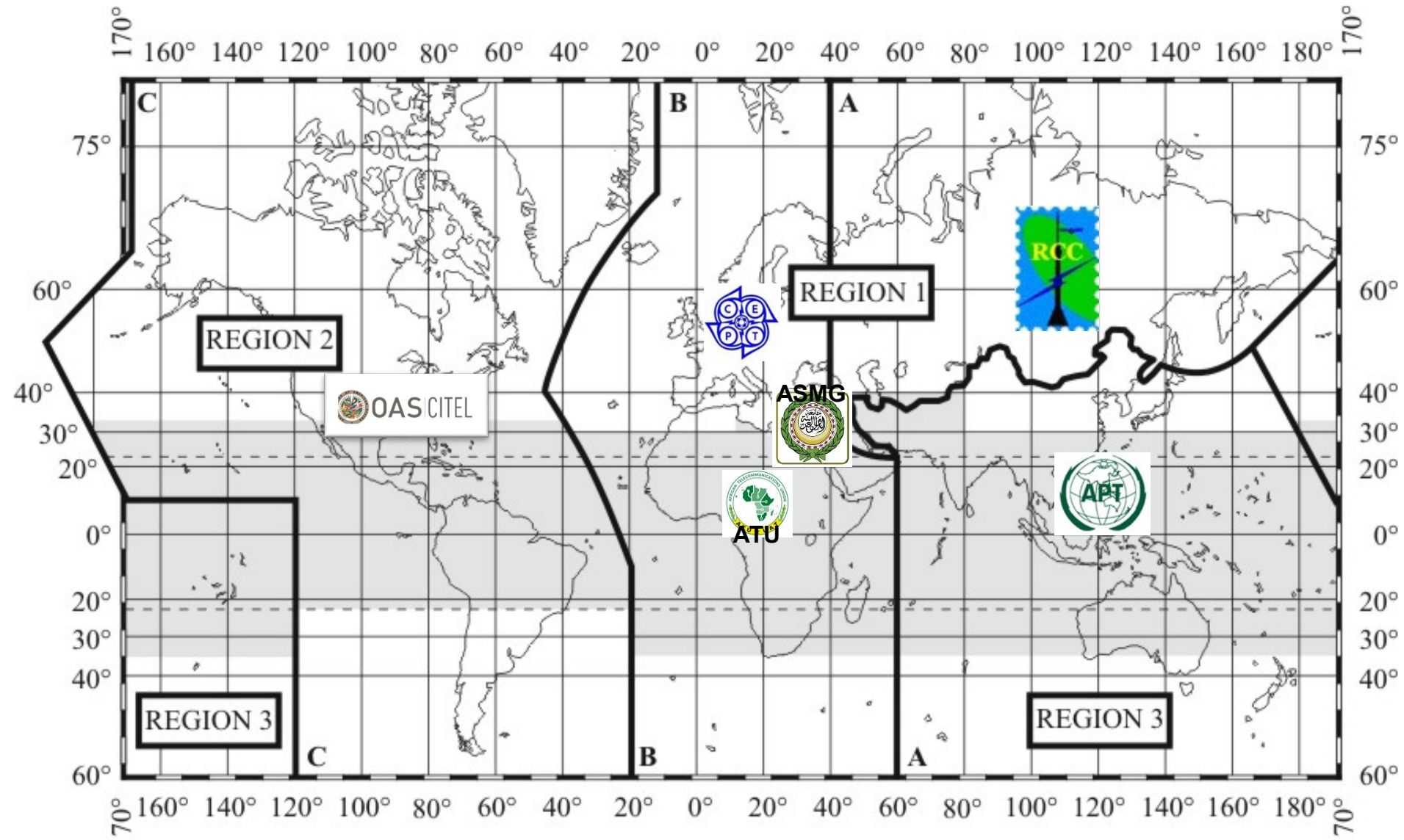
The World Radiocommunications Conference 2023 (WRC-23)



WRC Process



ITU-R Regions





Overview of the WRC preparatory process



Acronyms:

- ASMG – Arab Spectrum Management Group
- APT – Asia-Pacific Telecommunity
- ATU – African Telecommunication Union
- CEPT – European Conference of Postal and Telecommunications Administrations
- CITEL – Inter-American Telecommunication Commission
- CPM – Conference Preparatory Meeting
- RA – Radio Assembly
- RCC – Regional Commonwealth in the Field of Communications
- WRC – World Radiocommunications Conference

Key Outcomes of WRC-23

Broadband connectivity

- More mid-band (3 – 7 GHz) allocated to expand wireless broadband and cellular mobile technologies (5G, 6G and beyond)
- 2 GHz and 2.6 GHz bands allocated to high-altitude platform stations as IMT base stations (HIBS), which can serve to connect remote and rural areas and offer connectivity during disasters.
- New frequencies to deliver high-speed satellite broadband via earth stations in motion (ESIMs) onboard aircrafts, vessels, trains and even vehicles.

Safety

- Protection of ship and aircraft critical communications in international waters and airspace.
- Modernisation of global maritime distress and safety systems (GMDSS) used for distress communications at sea.

Science

- Allocation of additional frequencies for passive earth exploration satellites to enable advanced ice cloud measurements for better weather forecasting and climate monitoring.
- Recognition of the operation of space weather sensors as part of the meteorological aid service to observe space weather phenomena including solar flares, solar radiation and geomagnetic storms which can interfere with radiocommunication services including satellites, mobile phone services and navigation systems

Thank You

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