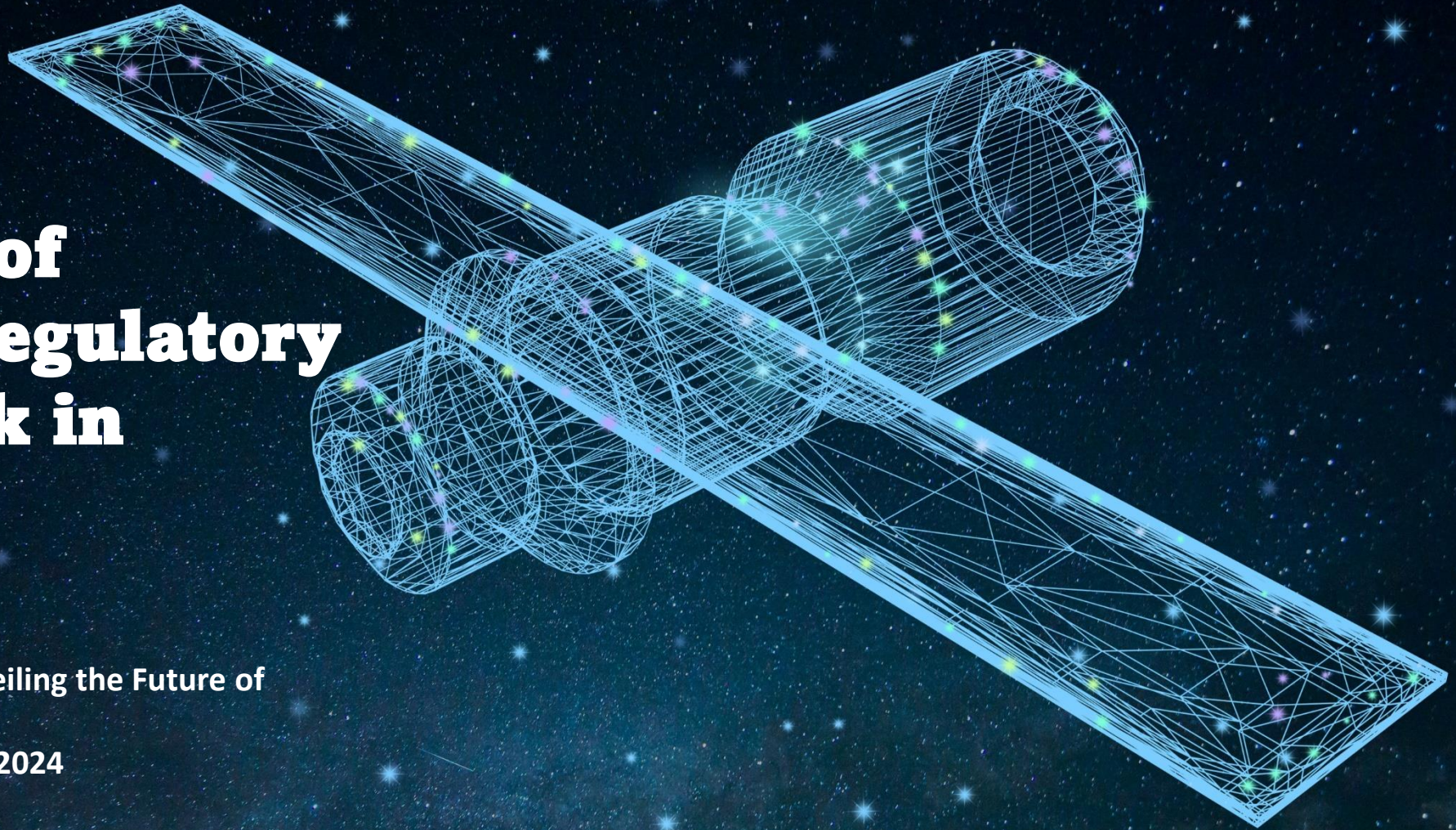




Overview of Satellite Regulatory Framework in Malaysia

Orbiting Innovations: Unveiling the Future of
Satellite Communications
DIGITAL OUTLOOK SERIES 2024
29 October 2024



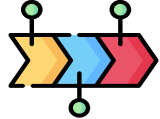
Outline



1 | International and National Regulations



2 | Malaysian Satellite Industry



3 | Spectrum Management



4 | Future Direction

Outline



1 | International and National Regulations



2 | Malaysian Satellite Industry



3 | Spectrum Management



4 | Future Direction

Who Owns the Space and Orbits?



Article I and Article II of the 1967 Outer Space Treaty :

No country or organization owns space; it is governed by international law.

The International Telecommunications Union (ITU) Constitution – Article 44:

Establishes the ITU's authority to regulate orbital slots and radio frequencies in a manner that ensure equal access for all countries.

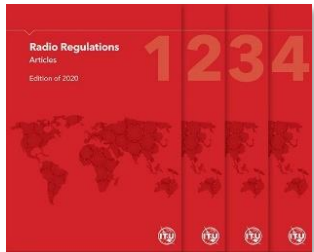
ITU Constitution – Article 45:

Assigns responsibility to each member state's administration (Malaysia - MCMC) for ensuring the use of the spectrum and orbits does not cause harmful interference and complies with international regulations.



Spectrum Framework

International



Radio Regulations

Rules of Procedure

ITU-R Resolutions

ITU-R Recommendations

SPACE LAW - Art. II of 1967 Outer Space Treaty

Not subject to national appropriation by claim or by occupation, but is free for exploitation and use by all States through their governmental or non-governmental entities in conformity with international regulations

Malaysia



Spectrum Plan

Standard Radio System Plans (SRSP)

Notifications

Guidelines

Standard Operating Procedures

- Communications and Multimedia Act 1998 (CMA)
- Communications and Multimedia (Spectrum) Regulations 2000 (Spectrum Regulations)

The Regulatory Bodies



BPA (Bahagian Penguasa Angkasa)

- Under the Ministry of Science, Technology, and Innovation (MOSTI)
- Established on 14 January 2022
- Govern and implement the regulations related to the Malaysian Space Board Act 2022 [Act 834]
- Managing Malaysian Space Board (MSB) affairs as the Executive Secretary, drafting relevant legal instruments to ensure effective implementation of the Act.
- Regulate space-related activities through licensing, permits, certification, registration of space objects, and conduct compliance inspections or investigations.



AGENSI ANGKASA MALAYSIA (MYSA)
MALAYSIAN SPACE AGENCY

MYSA (Malaysian Space Agency)

- Under the Ministry of Science, Technology, and Innovation (MOSTI)
- Spearhead the national space policy implementation
- Lead research and development for space sector in Malaysia, including but not limited to space exploration, satellite development, use of space for scientific research, and other space-based services like earth observation space technology in Malaysia.
- Coordinates Malaysia's compliance with international space regulations, including treaties and guidelines under UNOOSA (United Nations Office for Outer Space Affairs).



MCMC (Malaysian Communications and Multimedia Commission)

- Under the Ministry of Communications
- Regulates Malaysia's telecommunications industry, including the internet, mobile networks, and broadcasting.
- Ensures compliance with the Communications and Multimedia Act 1998, regulating telecommunications providers, content, and network security.
- Oversees the allocation and management of radio frequency spectrum, including the coordination of satellite communication frequencies with international bodies like the ITU.

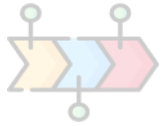
Outline



1 | International and National Regulations



2 | **Malaysian Satellite Industry**



3 | Spectrum Management



4 | Future Direction

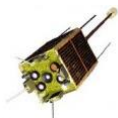
MALAYSIAN SATELLITE INDUSTRY – Key Milestone



WAWASAN
2020



Launch of MEASAT-1 and
MEASAT-2 satellites



Launch of
TiungSAT-1



Establishment of
the Malaysian
National Space
Agency (ANGKASA)

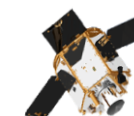


Launch of
MEASAT-3

MACRES was
known as
Malaysian
Remote
Sensing
Agency
(MRSA)



Launch of
MEASAT-3a



Launch of
RazakSAT



Launch of
MEASAT-3b



MCMC was
established on
1 Nov 1998

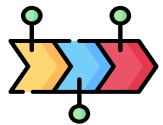
Outline



1 | International and National Regulations



2 | Malaysian Satellite Industry

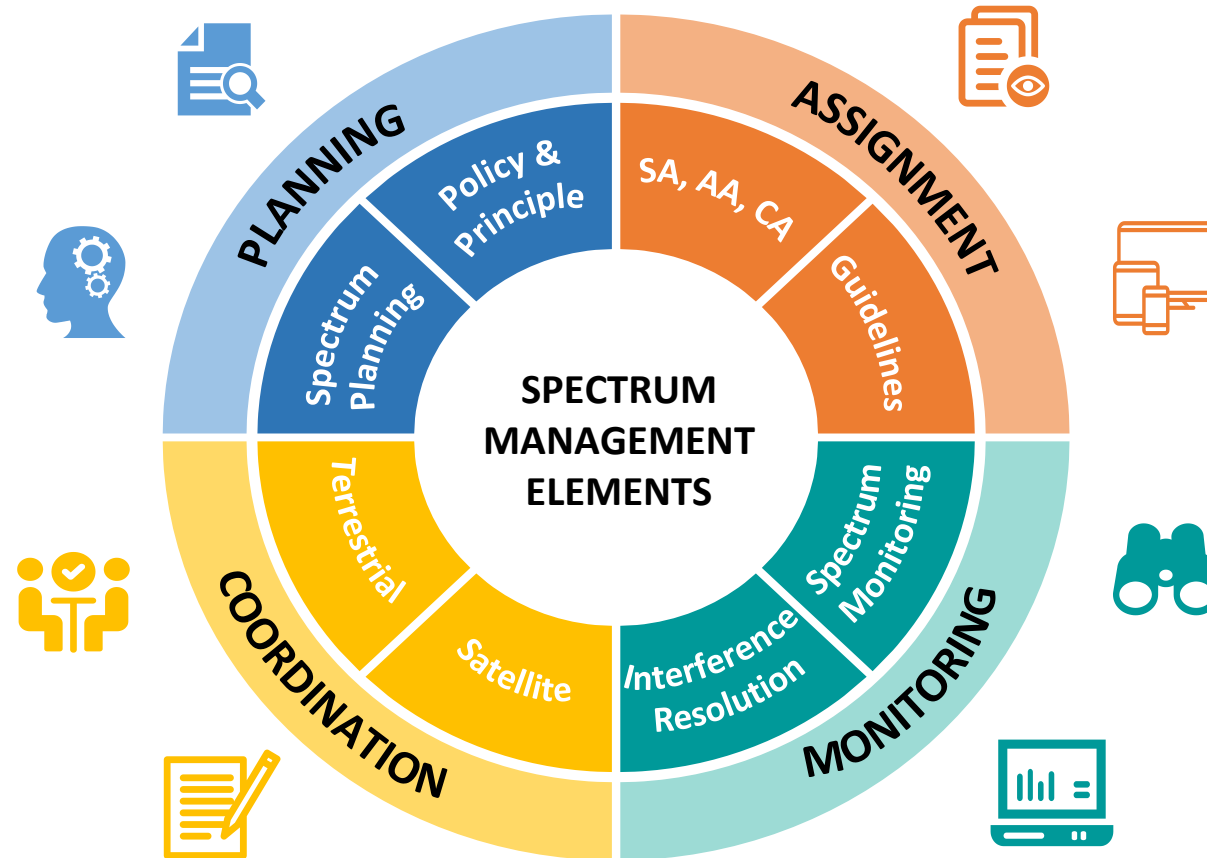
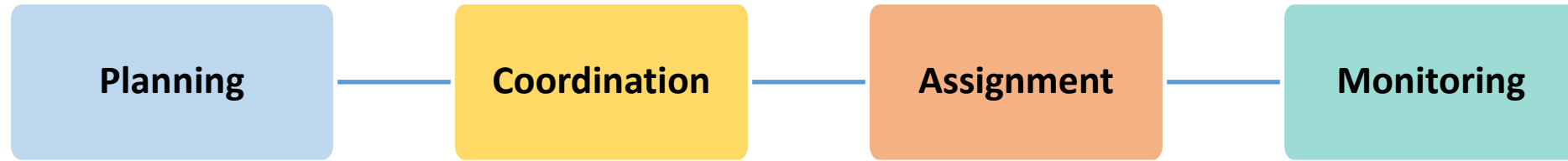


3 | Spectrum Management



4 | Future Direction

Spectrum Management Elements



SPECTRUM MANAGEMENT – National Framework

COMMUNICATIONS AND MULTIMEDIA ACT 1998

Part VII (Technical Regulation), Chapter 1 (Spectrum Assignment) – Relevant Provisions



SPECTRUM PLAN

Sections 172, 173 and 177



CLASS ASSIGNMENT

Sections 157, 169, 170 and 171



SPECTRUM ASSIGNMENT

Sections 157, 159, 160, 161, 162, 163, 174 and 176



DISPUTE ON INTERFERENCE

Section 175



APPARATUS ASSIGNMENT

Sections 157, 164, 165, 166, 167, 168, and 174



COMPULSORY ACQUISITION

Section 178



SPECTRUM MANAGEMENT – National Framework

COMMUNICATIONS AND MULTIMEDIA (SPECTRUM) REGULATIONS 2000

SPECTRUM PLANNING

Spectrum Plan, Marketing Plan,
Conversion Plan, Applicant
Information Package



ASSIGNMENT

Issuance, conditions, decision,
cancellation, variation



SPECTRUM ASSIGNMENT

Application, condition, fees,
validity period, cancellation,
transfer/dealing



APPARATUS ASSIGNMENT

Types, application, conditions,
fees, validity, third party
authorisation



SPECTRUM REGULATIONS 2000



CLASS ASSIGNMENT

Types, fees, validity



COMPULSORY ACQUISITION

Procedures, staggering of
acquisition, effect



GENERAL

Interference, form, fees, register
of assignment, penalty



FEE SCHEDULE

Apparatus assignment fees,
application fees

SPECTRUM PLANNING – National Frameworks

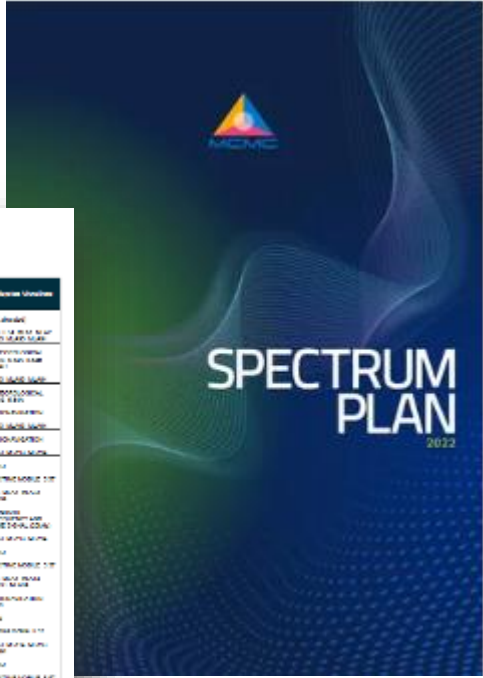


TABLE 1 – LIST OF FREQUENCY ALLOCATIONS

Frequency Band (MHz)	Service	Mode	Notes
670-690	Mobile	Mobile	...
700-720	Mobile	Mobile	...
730-760	Mobile	Mobile	...
770-800	Mobile	Mobile	...
810-840	Mobile	Mobile	...
850-880	Mobile	Mobile	...
890-920	Mobile	Mobile	...
930-960	Mobile	Mobile	...
970-1000	Mobile	Mobile	...
1010-1040	Mobile	Mobile	...
1050-1080	Mobile	Mobile	...
1090-1120	Mobile	Mobile	...
1130-1160	Mobile	Mobile	...
1170-1200	Mobile	Mobile	...
1210-1240	Mobile	Mobile	...
1250-1280	Mobile	Mobile	...
1290-1320	Mobile	Mobile	...
1330-1360	Mobile	Mobile	...
1370-1400	Mobile	Mobile	...
1410-1440	Mobile	Mobile	...
1450-1480	Mobile	Mobile	...
1490-1520	Mobile	Mobile	...
1530-1560	Mobile	Mobile	...
1570-1600	Mobile	Mobile	...
1610-1640	Mobile	Mobile	...
1650-1680	Mobile	Mobile	...
1690-1720	Mobile	Mobile	...
1730-1760	Mobile	Mobile	...
1770-1800	Mobile	Mobile	...
1810-1840	Mobile	Mobile	...
1850-1880	Mobile	Mobile	...
1890-1920	Mobile	Mobile	...
1930-1960	Mobile	Mobile	...
1970-2000	Mobile	Mobile	...
2010-2040	Mobile	Mobile	...
2050-2080	Mobile	Mobile	...
2090-2120	Mobile	Mobile	...
2130-2160	Mobile	Mobile	...
2170-2200	Mobile	Mobile	...
2210-2240	Mobile	Mobile	...
2250-2280	Mobile	Mobile	...
2290-2320	Mobile	Mobile	...
2330-2360	Mobile	Mobile	...
2370-2400	Mobile	Mobile	...
2410-2440	Mobile	Mobile	...
2450-2480	Mobile	Mobile	...
2490-2520	Mobile	Mobile	...
2530-2560	Mobile	Mobile	...
2570-2600	Mobile	Mobile	...
2610-2640	Mobile	Mobile	...
2650-2680	Mobile	Mobile	...
2690-2720	Mobile	Mobile	...
2730-2760	Mobile	Mobile	...
2770-2800	Mobile	Mobile	...
2810-2840	Mobile	Mobile	...
2850-2880	Mobile	Mobile	...
2890-2920	Mobile	Mobile	...
2930-2960	Mobile	Mobile	...
2970-3000	Mobile	Mobile	...
3010-3040	Mobile	Mobile	...
3050-3080	Mobile	Mobile	...
3090-3120	Mobile	Mobile	...
3130-3160	Mobile	Mobile	...
3170-3200	Mobile	Mobile	...
3210-3240	Mobile	Mobile	...
3250-3280	Mobile	Mobile	...
3290-3320	Mobile	Mobile	...
3330-3360	Mobile	Mobile	...
3370-3400	Mobile	Mobile	...
3410-3440	Mobile	Mobile	...
3450-3480	Mobile	Mobile	...
3490-3520	Mobile	Mobile	...
3530-3560	Mobile	Mobile	...
3570-3600	Mobile	Mobile	...
3610-3640	Mobile	Mobile	...
3650-3680	Mobile	Mobile	...
3690-3720	Mobile	Mobile	...
3730-3760	Mobile	Mobile	...
3770-3800	Mobile	Mobile	...
3810-3840	Mobile	Mobile	...
3850-3880	Mobile	Mobile	...
3890-3920	Mobile	Mobile	...
3930-3960	Mobile	Mobile	...
3970-4000	Mobile	Mobile	...
4010-4040	Mobile	Mobile	...
4050-4080	Mobile	Mobile	...
4090-4120	Mobile	Mobile	...
4130-4160	Mobile	Mobile	...
4170-4200	Mobile	Mobile	...
4210-4240	Mobile	Mobile	...
4250-4280	Mobile	Mobile	...
4290-4320	Mobile	Mobile	...
4330-4360	Mobile	Mobile	...
4370-4400	Mobile	Mobile	...
4410-4440	Mobile	Mobile	...
4450-4480	Mobile	Mobile	...
4490-4520	Mobile	Mobile	...
4530-4560	Mobile	Mobile	...
4570-4600	Mobile	Mobile	...
4610-4640	Mobile	Mobile	...
4650-4680	Mobile	Mobile	...
4690-4720	Mobile	Mobile	...
4730-4760	Mobile	Mobile	...
4770-4800	Mobile	Mobile	...
4810-4840	Mobile	Mobile	...
4850-4880	Mobile	Mobile	...
4890-4920	Mobile	Mobile	...
4930-4960	Mobile	Mobile	...
4970-5000	Mobile	Mobile	...
5010-5040	Mobile	Mobile	...
5050-5080	Mobile	Mobile	...
5090-5120	Mobile	Mobile	...
5130-5160	Mobile	Mobile	...
5170-5200	Mobile	Mobile	...
5210-5240	Mobile	Mobile	...
5250-5280	Mobile	Mobile	...
5290-5320	Mobile	Mobile	...
5330-5360	Mobile	Mobile	...
5370-5400	Mobile	Mobile	...
5410-5440	Mobile	Mobile	...
5450-5480	Mobile	Mobile	...
5490-5520	Mobile	Mobile	...
5530-5560	Mobile	Mobile	...
5570-5600	Mobile	Mobile	...
5610-5640	Mobile	Mobile	...
5650-5680	Mobile	Mobile	...
5690-5720	Mobile	Mobile	...
5730-5760	Mobile	Mobile	...
5770-5800	Mobile	Mobile	...
5810-5840	Mobile	Mobile	...
5850-5880	Mobile	Mobile	...
5890-5920	Mobile	Mobile	...
5930-5960	Mobile	Mobile	...
5970-6000	Mobile	Mobile	...
6010-6040	Mobile	Mobile	...
6050-6080	Mobile	Mobile	...
6090-6120	Mobile	Mobile	...
6130-6160	Mobile	Mobile	...
6170-6200	Mobile	Mobile	...
6210-6240	Mobile	Mobile	...
6250-6280	Mobile	Mobile	...
6290-6320	Mobile	Mobile	...
6330-6360	Mobile	Mobile	...
6370-6400	Mobile	Mobile	...
6410-6440	Mobile	Mobile	...
6450-6480	Mobile	Mobile	...
6490-6520	Mobile	Mobile	...
6530-6560	Mobile	Mobile	...
6570-6600	Mobile	Mobile	...
6610-6640	Mobile	Mobile	...
6650-6680	Mobile	Mobile	...
6690-6720	Mobile	Mobile	...
6730-6760	Mobile	Mobile	...
6770-6800	Mobile	Mobile	...
6810-6840	Mobile	Mobile	...
6850-6880	Mobile	Mobile	...
6890-6920	Mobile	Mobile	...
6930-6960	Mobile	Mobile	...
6970-7000	Mobile	Mobile	...
7010-7040	Mobile	Mobile	...
7050-7080	Mobile	Mobile	...
7090-7120	Mobile	Mobile	...
7130-7160	Mobile	Mobile	...
7170-7200	Mobile	Mobile	...
7210-7240	Mobile	Mobile	...
7250-7280	Mobile	Mobile	...
7290-7320	Mobile	Mobile	...
7330-7360	Mobile	Mobile	...
7370-7400	Mobile	Mobile	...
7410-7440	Mobile	Mobile	...
7450-7480	Mobile	Mobile	...
7490-7520	Mobile	Mobile	...
7530-7560	Mobile	Mobile	...
7570-7600	Mobile	Mobile	...
7610-7640	Mobile	Mobile	...
7650-7680	Mobile	Mobile	...
7690-7720	Mobile	Mobile	...
7730-7760	Mobile	Mobile	...
7770-7800	Mobile	Mobile	...
7810-7840	Mobile	Mobile	...
7850-7880	Mobile	Mobile	...
7890-7920	Mobile	Mobile	...
7930-7960	Mobile	Mobile	...
7970-8000	Mobile	Mobile	...
8010-8040	Mobile	Mobile	...
8050-8080	Mobile	Mobile	...
8090-8120	Mobile	Mobile	...
8130-8160	Mobile	Mobile	...
8170-8200	Mobile	Mobile	...
8210-8240	Mobile	Mobile	...
8250-8280	Mobile	Mobile	...
8290-8320	Mobile	Mobile	...
8330-8360	Mobile	Mobile	...
8370-8400	Mobile	Mobile	...
8410-8440	Mobile	Mobile	...
8450-8480	Mobile	Mobile	...
8490-8520	Mobile	Mobile	...
8530-8560	Mobile	Mobile	...
8570-8600	Mobile	Mobile	...
8610-8640	Mobile	Mobile	...
8650-8680	Mobile	Mobile	...
8690-8720	Mobile	Mobile	...
8730-8760	Mobile	Mobile	...
8770-8800	Mobile	Mobile	...
8810-8840	Mobile	Mobile	...
8850-8880	Mobile	Mobile	...
8890-8920	Mobile	Mobile	...
8930-8960	Mobile	Mobile	...
8970-9000	Mobile	Mobile	...
9010-9040	Mobile	Mobile	...
9050-9080	Mobile	Mobile	...
9090-9120	Mobile	Mobile	...
9130-9160	Mobile	Mobile	...
9170-9200	Mobile	Mobile	...
9210-9240	Mobile	Mobile	...
9250-9280	Mobile	Mobile	...
9290-9320	Mobile	Mobile	...
9330-9360	Mobile	Mobile	...
9370-9400	Mobile	Mobile	...
9410-9440	Mobile	Mobile	...
9450-9480	Mobile	Mobile	...
9490-9520	Mobile	Mobile	...
9530-9560	Mobile	Mobile	...
9570-9600	Mobile	Mobile	...
9610-9640	Mobile	Mobile	...
9650-9680	Mobile	Mobile	...
9690-9720	Mobile	Mobile	...
9730-9760	Mobile	Mobile	...
9770-9800	Mobile	Mobile	...
9810-9840	Mobile	Mobile	...
9850-9880	Mobile	Mobile	...
9890-9920	Mobile	Mobile	...
9930-9960	Mobile	Mobile	...
9970-10000	Mobile	Mobile	...

Regulation 3 of Spectrum Regulations 2000:

- divided into such number of frequency bands
- designate one or more bands to be used primarily for the general purpose of the armed forces
- specific purpose – reservation for public, community, prevention or control of interference or for specified geographic area or period

STANDARD RADIO SYSTEM PLAN

Objective

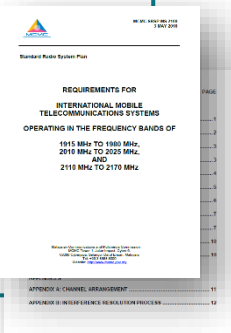
- Provide information on the minimum technical and regulatory requirements for efficient use of the spectrum

Content

- Radio systems
- Channeling plan/arrangement
- Requirement for use
- Principle of assignment
- Implementation/operation requirement
- Coordination requirement

Availability

- Made available to the public



CLASS ASSIGNMENT

Objectives

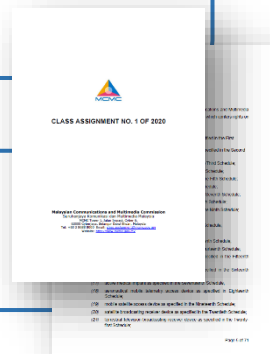
- To guide the public on the use of spectrum under class assignment

Content

- Definition of radiocommunication devices
- Identified frequency bands and channeling plan
- Assignment principle
- Conditions and restrictions imposed
- Other operational requirement

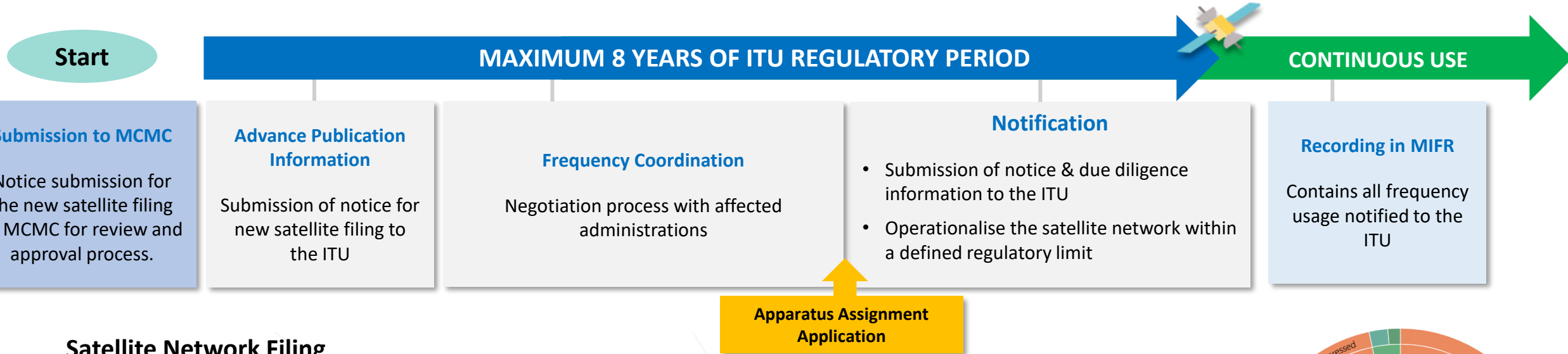
Availability

- Made available to the public



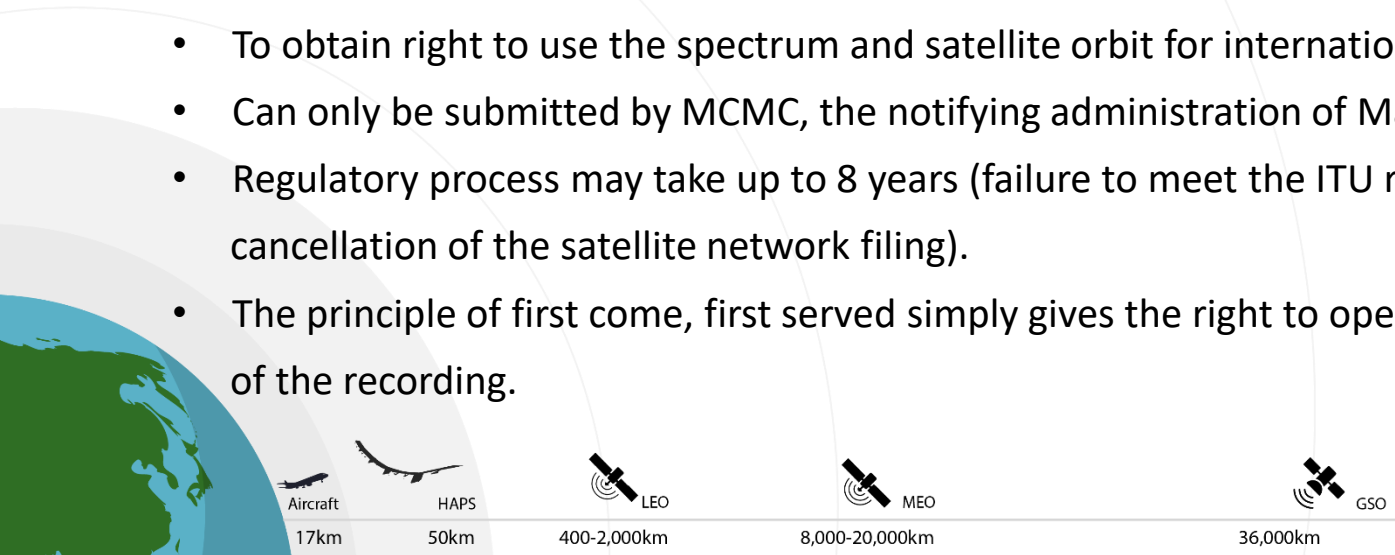
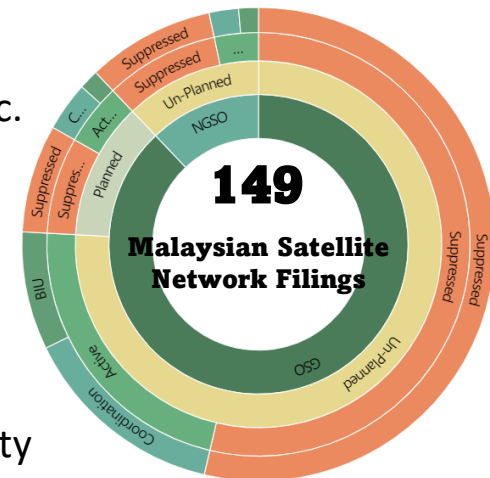
ITU SATELLITE NETWORK FILING PROCESS

The process of the satellite network filing to be recorded in the Master International Frequency Register (MIFR) may take up to 8 years



Satellite Network Filing

- Provides information on the satellite orbital parameters, type of services, coverage and service areas etc.
- To obtain right to use the spectrum and satellite orbit for international recognition and protection.
- Can only be submitted by MCMC, the notifying administration of Malaysian satellite networks.
- Regulatory process may take up to 8 years (failure to meet the ITU requirements will result in the cancellation of the satellite network filing).
- The principle of first come, first served simply gives the right to operate a frequency based on the priority of the recording.

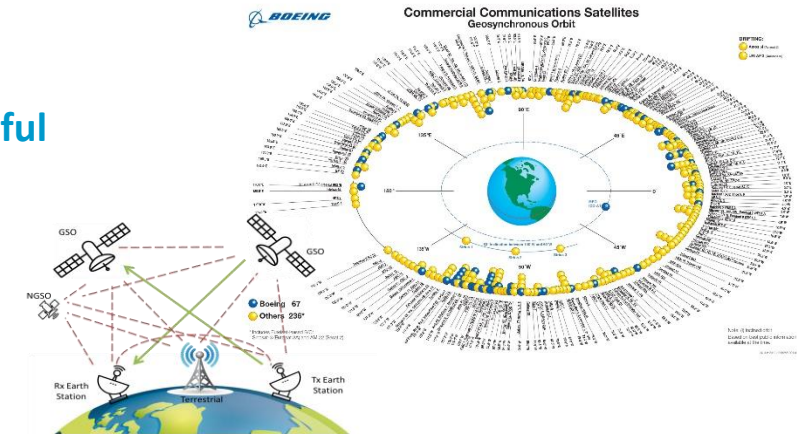


SPECTRUM COORDINATION & NOTIFICATION – Overview

Coordination of Satellite Network Filings between Administrations

- Formal regulatory obligation for administration seeking to assign new frequency assignment in its network towards other administration's existing/planned services that may be affected by the new assignment

Negotiation between Malaysia and other Administrations to avoid harmful interference with existing services



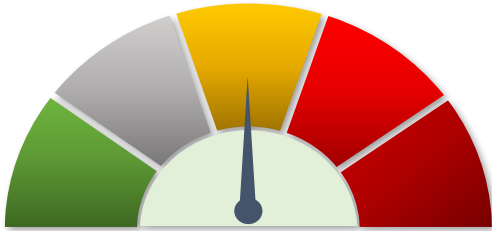
Notification of Malaysia's Satellite Network Filings to ITU

- MCMC acts as notifying administration for Malaysia's satellite network filings
- ITU has set out procedures and provisions in ITU Radio Regulations prior to operation of satellites

Notification of frequency assignment for Malaysia's satellite systems for international recognition

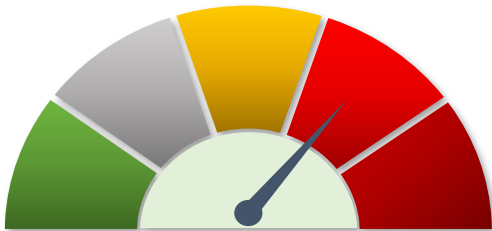


SPECTRUM MONITORING – CMA98



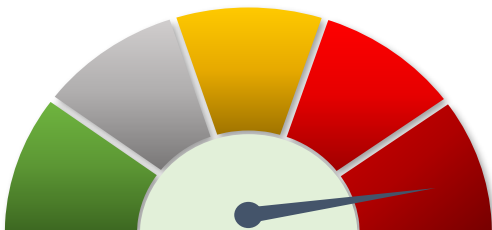
Minor Interference

Electromagnetic interference which does not affect the overall operation of any radiocommunications transmission



Major Interference

Electromagnetic interference
(a) rendering any apparatus or services unsuitable for their intended purpose; or
(b) degrades or obstructs, or repeatedly interrupts a radiocommunications service



Harmful Interference

Interference which endangers or seriously degrades, obstructs or repeatedly interrupts the functioning of a radionavigation service or safety service(s)

Interference Resolution Priority

1

Primary services have priority over secondary services

2

SA and AA have equal priority but are of higher priority than CA

3

In the event where service priority and assignment type priority are equal for affected parties, the following list will determine the priority level for the interference case (the earlier in the list is given higher priority):

- Safety or radionavigation service
- Based on the date of assignment
 - priority is given to the earliest/first installation

SPECTRUM MONITORING – ITU-R Radio Regulations



Permissible Interference (1.167)

Observed or predicted interference which complies with quantitative interference and sharing criteria contained in the Regulations or in ITU-R Recommendations or in special agreements as provided for in the Radio Regulations



Acceptable Interference (1.168)

Interference at a higher level than that defined as permissible interference and which has been agreed upon between two or more administrations without prejudice to other administrations



Harmful Interference see No. 1.169

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

ITU online reporting of harmful interference cases affecting space services, “*Satellite Interference Reporting and Resolution System (SIRRS)*” (<https://www.itu.int/ITU-R/space/sirrs>),

Broader Regulatory Frameworks for Satellite Operations



Licensing Guidebook

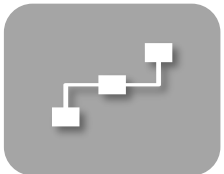
Provides a guide to the type of information that is required in all licence applications and the criteria applied by the MCMC in evaluating all licence applications.



Guidelines for Apparatus Assignment

Pursuant to paragraph 21(2)(b) of the Communications and Multimedia (Spectrum) Regulations 2000, the Guidelines give guidance to interested parties and the general public.

Interactive Guideline: Apparatus Assignment Interactive Guideline “AAIG”



Guideline for Trial, Experimental & Demonstration

Innovation process involves research, development, trial and error. In promoting and facilitating this process, MCMC may provide some regulatory flexibility and temporary usage of spectrum, subject to an approval on a case-by-case basis.



Guideline on Nomination for Free Entitlement from ITU Cost Recovery for Satellite Network Filing

Outline the application and evaluation process for the nomination of a Malaysian satellite network filing for free entitlement from cost recovery at the ITU

Outline



1 | International and National Regulations



2 | Malaysian Satellite Industry



3 | Spectrum Management



4 | **Future Direction**

NEW SATELLITE EMERGING TECHNOLOGIES

Small Satellites
CubeSats,
FemtoSats

Satellite
Constellations

High-
Throughput
Satellites (HTS)

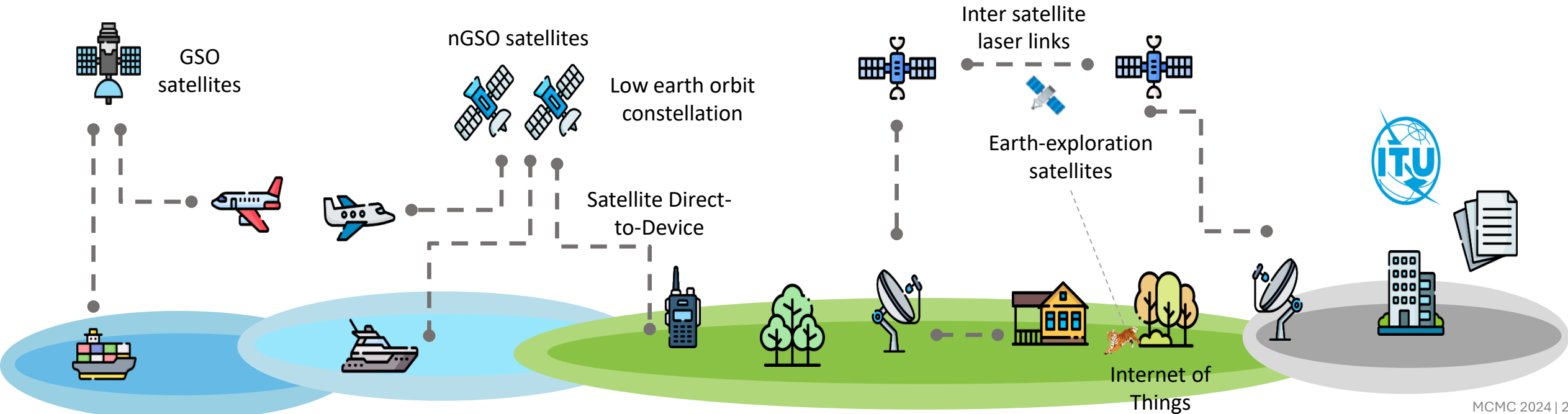
Inter-Satellite
Laser Links

5G and
Satellite
Integration

Space Debris
Mitigation and
Active Debris
Removal

In-Orbit
Servicing and
Refueling

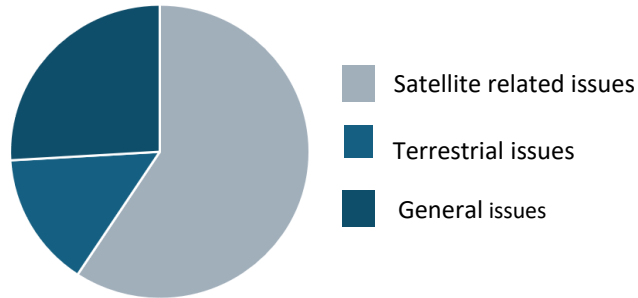
Satellite Direct-
to-Device



Summary of agenda items for WRC-27 – Satellite issues



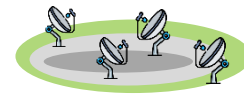
27 agenda items were approved for WRC-27:



- Satellite related issues (FSS/BSS/MSS/ESS)
16 agenda items
- Terrestrial issues (FS/MS/RLS/AMS)
4 agenda items
- General issues
7 agenda items



Consideration of technical and operational conditions for FSS GSO/non-GSO aeronautical and maritime ESIM in the Q/V bands **(AI 1.1)**



Possible revisions of sharing conditions in the 13.75–14 GHz frequency band to allow the use of FSS uplink for earth stations with smaller antenna sizes **(AI 1.2)**



New primary allocation for FSS/BSS in 17 GHz band **(AI 1.4)**



Possible spectrum allocation to FSS downlink in the 17.3–17.7 GHz frequency band and BSS downlink in the 17.3–17.8 GHz frequency band in Region 3 **(AI 1.5)**



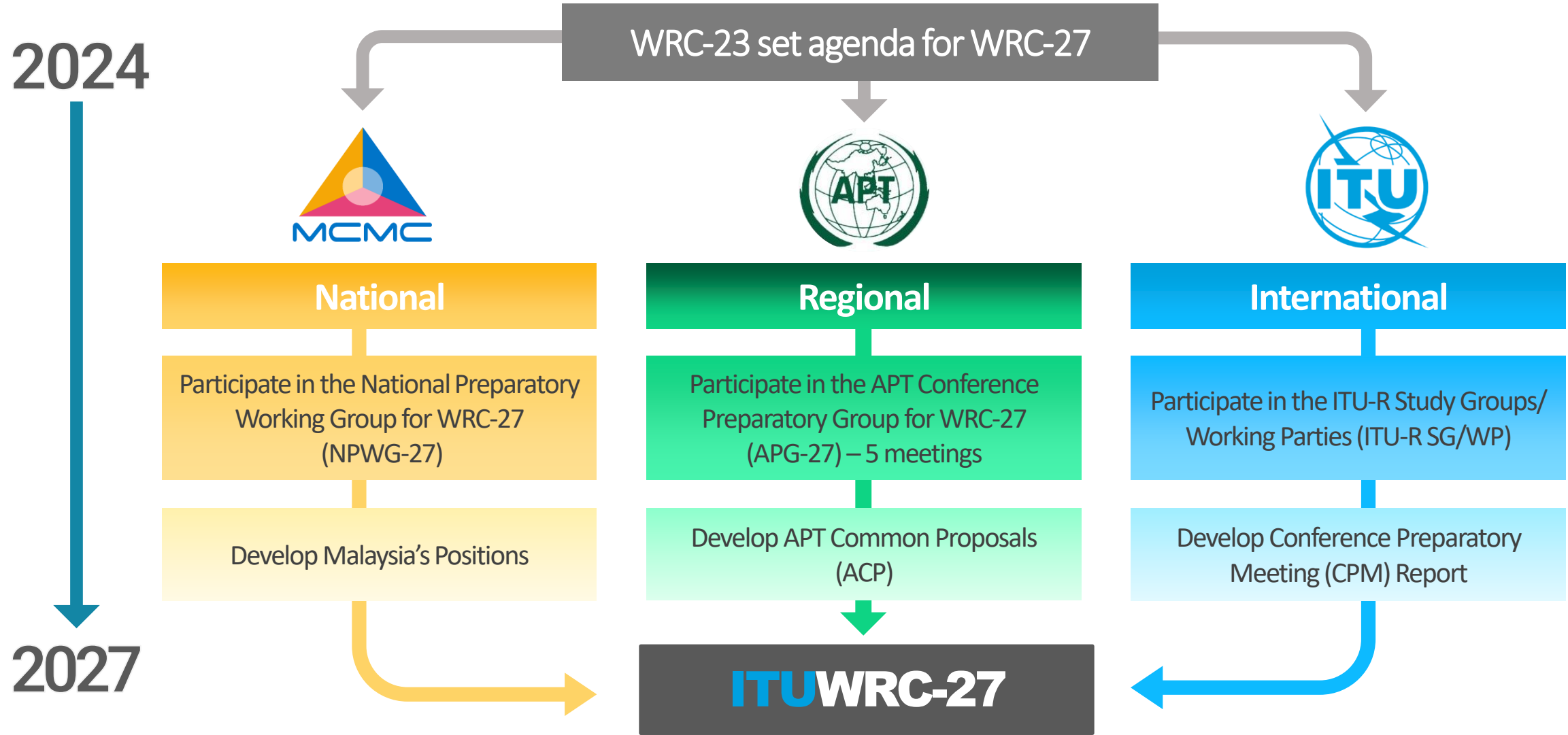
Potential spectrum allocations and regulatory actions for future development of low-data-rate non-GSO MSS (small satellites) **(AI 1.12)**



Allocation for MSS direct-to-device to complement terrestrial IMT network between 694/698 MHz to 2.7 GHz frequency bands **(AI 1.13)**

Possible spectrum allocations in all Regions to EESS (passive) in the 4200–4400 MHz and 8400–8500 MHz frequency bands **(AI 1.19)**

Preparatory Process for WRC-27



The National Preparatory Working Group for the WRC-27 (NPWG-27)



1st Meeting : 13 June 2024

Objective

- To develop Malaysia's views and positions for WRC-27 agenda items

Duration of NPWG-27

- Starting from July 2024 until the end of WRC-27 cycle

Roles and Functions of the NPWG-27

- Identify issues on each WRC-27 agenda item
- Study and analyse WRC-27 agenda items through participation in ITU-R SG/WP and APT meetings
- Consult with spectrum users and stakeholders
- Consolidate views from NPWG-27 members and public
- Assess technical and regulatory impact to users & industry

Members of the NPWG-27

- Ministry of Communications;
- Malaysian Communications and Multimedia Commission;
- Ministry of Digital;
- Ministry of Foreign Affairs;
- Ministry of Home Affairs;
- Ministry of Science, Technology and Innovation;
- Attorney General Chamber;
- Malaysian National Security Council;
- Spectrum users from government agencies;
- Telecommunication companies and service providers;
- Broadcasters;
- Amateur radio operators;
- Academicians; and
- Researchers.

NPWG-27 Working Groups

WORKING GROUP 1

Fixed satellite and
broadcasting satellite
issues

WORKING GROUP 2

Fixed, mobile and
radiolocation issues

WORKING GROUP 3

Mobile-satellite
issues

WORKING GROUP 4

Science issues

WORKING GROUP 5

General issues

For Further Information...

Satellite Section in the MCMC website for quick and easy access to key information

Guidelines on the use of spectrum for commercial and trial purposes

Capacity Building and Industry Development – Participation in the NPWG-27 and Future Public Consultation



THANK YOU