MCMC SRSP MS 450
12 SEPTEMBER 2024

Standard Radio System Plan

REQUIREMENTS FOR

INTERNATIONAL MOBILE TELECOMMUNICATIONS SYSTEMS

OPERATING IN THE FREQUENCY BANDS OF

452.5 MHz TO 457.5 MHz
AND
462.5 MHz TO 467.5 MHz

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SECTION

1 FOREWORD

1.1 This Standard Radio System Plan ("**SRSP**") is prepared by the Malaysian Communications and Multimedia Commission ("**MCMC**") pursuant to the Communications and Multimedia Act 1998 ("**Act**") and Spectrum Plan ("**Spectrum Plan**") to provide information on minimum technical and regulatory requirements for efficient use of the **452.5 MHz to 457.5 MHz paired with 462.5 MHz to 467.5 MHz** frequency bands ("**the said bands**").

1.2 This SRSP does not attempt to establish any detailed equipment standards.

1.3 In the event there are any inconsistencies between this SRSP and the Act or any subsidiary legislation made under the Act, the Act or the subsidiary legislation shall prevail.

2 ABBREVIATIONS

AA	Apparatus Assignment
CA	Class Assignment
DM RS	Demodulation Reference Signal
EIRP	Effective Isotropic Radiated Power
FACSMAB	Frequency Assignment Committee of Singapore, Malaysia and Brunei Darussalam
IMT	International Mobile Telecommunication
ITU	International Telecommunication Union
ITU-R	ITU Radiocommunication Sector
JCC	Joint Committee on Communications between the Republic of Indonesia and Malaysia
JTC	Joint Technical Committee on Coordination and Assignment of Frequencies along Malaysia-Thailand Common Border
MIMO	Multiple Input Multiple Output
NFP(I)	Network Facilities Provider Individual
PCI	Physical-Layer Cell Identities
PRACH	Physical Random Access Channel
PN	Pseudo Noise
RFI	Radio Frequency Interference
SA	Spectrum Assignment
SRSP	Standard Radio System Plan

3 INTENT

3.1 This SRSP is intended to ensure efficient provision of mobile service in Malaysia with minimal service disruption and radio frequency interference among the service providers.

3.2 This SRSP states the requirements for the utilisation of the said bands.

3.3 The usage of the said bands is intended for the purpose of providing wireless telecommunication connectivity for machine type communications and internet of things applications for utilities such as smart grids and smart meters.

3.4 The term 'IMT system' in this document is referred to IMT-Advanced system.

4 GENERAL

4.1 The technical characteristics of the equipment used in IMT system including the equipment designed for consumer use, i.e. the end users, such as mobile phones or other mobile devices ("**user equipment**") and the fixed station that communicates with user equipment via radio waves ("**base station**"). The user equipment and base station ("**IMT system equipment**") shall conform with all applicable Malaysian standards, international standards, ITU and its radio regulations as agreed and adopted by Malaysia.

4.2 All IMT system equipment installations shall comply with safety rules as specified in the applicable standards.

4.3 The IMT system equipment used shall be certified under the Communications and Multimedia (Technical Standards) Regulations 2000.

4.4 For new installations of the IMT system equipment, starting 1 January 2023, the assignment holders shall affix or provide a label that clearly indicates the assignment holder's ownership ("**Label**") on the apparatus such as cables terminating with antenna, remote radio unit, equipment rack and any other relevant apparatus ("**Apparatus**") to facilitate interference investigation and/or audit performed by MCMC.

4.5 The Label shall be physically affixed on the Apparatus. This is to facilitate the identification of the operating frequency and the owner, i.e. assignment holder of the said bands ("**assignment holder**") of the Apparatus.

4.6 The equipment rack for the Apparatus shall be specifically labelled with the assignment holder's name and the operating frequencies.

4.7 The allocation of the said bands and information in this SRSP are subject to review by MCMC from time to time to reflect new developments on the use of the said bands in the communications and multimedia industry.

5 CHANNEL ARRANGEMENT

5.1 The allocation of services within the said bands is described in the Spectrum Plan.

5.2 For the deployment of IMT system in the said bands, the channel arrangement is shown in **Appendix A** of this SRSP. The channel arrangement is based on the radio frequency arrangement of the Recommendation ITU-R M.1036 in force at that particular time.

6 REQUIREMENTS FOR USAGE OF SPECTRUM

6.1 This SRSP covers the minimum requirements to be followed by the assignment holder in order to ensure efficient use of the said bands.

6.2 The use of the said bands shall only be allowed for the deployment of IMT-Advanced system.

6.3 The said bands are not limited in their use for direct radio connection between a base station and user equipment in a point-to-multipoint configuration. It should be further noted that the operation of the IMT system in the said bands is allowed as long as it does not cause any interference to other services in the adjacent frequency bands. The coexistence and mitigation of interference may require adopting several engineering solutions based on the industry best practise, guidelines and recommendations described in this SRSP.

6.4 The maximum radiated power and unwanted emission for IMT system in the said bands are as follows:

6.4.1 Base station

6.4.1.1 base station in-block transmissions should not exceed 43 dBm EIRP per antenna;

6.4.1.2 for the case of MIMO deployment, the above EIRP value shall be applicable per transmit port of the antenna;

6.4.1.3 subject to assessment by MCMC, a higher EIRP value may be permitted provided that a reasonable technical justification is provided to MCMC; and

6.4.1.4 the unwanted emissions in out-of-band and spurious domain outside an assignment holder's assigned frequency blocks shall comply with the Recommendation ITU-R M.2070 in force at that particular time.

6.4.2 User equipment

6.4.2.1 user equipment transmissions should not exceed 23 dBm EIRP for mobile/nomadic terminal station and should not exceed 31 dBm EIRP for fixed terminal station; and

6.4.2.2 the unwanted emissions in out-of-band and spurious domain outside an assignment holder's assigned frequency blocks shall comply with the Recommendation ITU-R M.2071 in force at that particular time.

6.5 The use of the said bands shall not cause harmful interference to and shall not claim protection from broadcasting service in the adjacent band.

6.6 A radio system conforming to the requirements of this SRSP may require modifications if major interference is caused to other radiocommunication stations or systems.

6.7 When an unwanted emission outside of an assigned frequency block causes harmful interference, MCMC may at its discretion, impose higher attenuation than specified in paragraph 6.4.

6.8 For avoidance of doubt, MCMC shall not be responsible for any costs incurred as a result of the system modification. The cost of modification shall be fully borne by the assignment holder.

7 PRINCIPLES OF ASSIGNMENT

7.1 Authorisation to use the said bands shall be subject to the following:

7.1.1 by way of AA for IMT system base station apparatus; and

7.1.2 by way of CA for IMT system user equipment and is required to comply with the CA document in force at that particular time issued by MCMC pursuant to section 169 of the Act.

7.2 Issuance of AA within the said bands shall be subject to successful coordination among assigned stations and with neighbouring countries where it applies.

7.3 The application for AA for the said bands is exclusively open to NFP (I) license holders who operate radiocommunication transmitters and links. This paragraph does not apply if the said bands are intended to be used for private network usage.

7.4 Applicants are required to submit:

7.4.1 AA application for the apparatus on the prescribed AA form in accordance with the Act, the Communications and Multimedia (Spectrum) Regulations 2000 ("**Spectrum Regulations**") and any relevant instrument issued by MCMC from time to time; and

7.4.2 any other documents and/or information that may be requested by MCMC.

7.5 The AA shall be assigned based on a first come first served basis.

8 COORDINATION REQUIREMENT

8.1 Operator-to-operator Coordination

8.1.1 The assignment holder shall ensure that the operation of the IMT system will not cause interference to other services in the said bands and the adjacent frequency bands at all material times.

8.1.2 The assignment holder operating in the said bands shall ensure that its system only operate within the assigned frequency bands.

8.1.3 Coordination between IMT system base stations operating in the same frequency band is required to mitigate the interference.

8.1.4 A geographical separation distance of at least 20 km from the nearest transmitting base station in the said bands is required.

8.1.5 Operator-to-operator coordination as the following may be required to avoid interference:

8.2.2.1. In the case of within 20km geographical separation distance, the mean field strength produced by the cell does not exceed the value of 37 dBμV/m/5MHz (-70 dBm/5MHz) at a height of 3 m above ground at the cell edge of both different assignment holders' base stations;

8.2.2.2. Assignment holders shall consider applying general techniques for interference mitigation including but not limited to direction of antenna, antenna tilting, transmit power control, DM RS and PRACH coordination etc.; and

8.2.2.3. Assignment holders are encouraged to work through operator-to-operator coordination for further interference mitigation, if any.

8.2 Common Border Area Coordination

8.2.1 The use of the said bands shall also require coordination with the neighbouring countries within the coordination zones. The

coordination zones are based on agreements reached at border committees namely FACSMAB, JTC, JCC and the Trilateral coordination meeting between the Republic of Indonesia, Malaysia and Singapore.

8.2.2 In the event there is no agreement on coordination zone, a zone within 50 km from the neighbouring countries will be used.

8.2.3 It shall be noted that the coordination distance and other coordination parameters between Malaysia and the neighbouring countries may be reviewed and updated from time to time.

8.2.4 An agreement on the frequency bands plan from one neighbouring country to another may differ subject to the requirements of the respective country.

8.3 The assignment holder shall take all necessary actions on interference mitigation techniques including but not limited to antenna discrimination, tilt, polarization, frequency discrimination, shielding/blocking (introduce diffraction loss), site selection, power control, PCI codes, PN codes and/or filter installation to facilitate the coordination of systems.

8.4 In the event of any interference, MCMC shall have the discretion to decide the necessary modifications and to schedule the time for the modifications to resolve the interference. MCMC will be guided by the interference resolution process as shown in **Appendix B** of this SRSP ("**Interference Resolution Process**").

8.5 Any costs incurred as a result of the coordination processes stipulated in this Coordination Requirement section shall be fully borne by the assignment holder.

9 IMPLEMENTATION

9.1 This SRSP shall be effective on the date of issuance of this document.

10 REVOCATION

10.1 MCMC SRSP MS 450 dated 20 July 2022 is hereby revoked.

11 REFERENCES

i) **Spectrum Plan**

ii) **Recommendation ITU-R M.1036** - Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications in the bands identified for IMT in the Radio Regulations

iii) **Recommendation ITU-R M.2070** - Generic unwanted emission characteristic of base stations using the terrestrial radio interfaces of IMT-Advanced

iv) **Recommendation ITU-R M.2071** - Generic unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT-Advanced

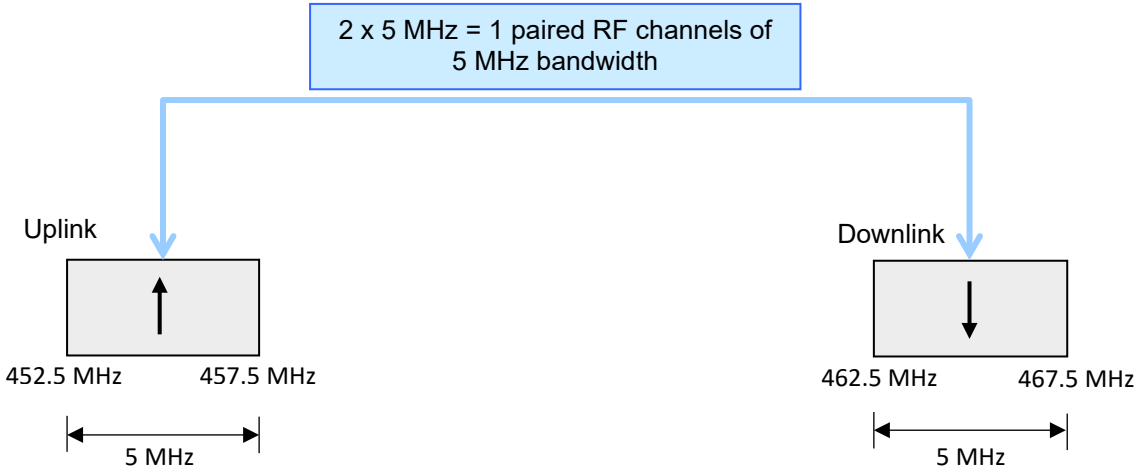
v) **ECC Decision (19)02 -** Land mobile systems in the frequency ranges 68-87.5MHz, 146-174 MHz, 406.1-410 MHz, 410-430 MHz, 440-450 MHz and 450-470 MHz

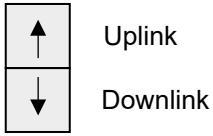
vi) **Recommendation T/R 25-08 -** Planning criteria and cross-border coordination of frequencies for land mobile systems in the range 29.7-470 MHz

vii) **3GPP TS 36.101 -** 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception

APPENDIX A: CHANNEL ARRANGEMENT

CHANNEL ARRANGEMENT OF IMT SYSTEM OF
452.5 MHz TO 457.5 MHz PAIRED WITH 462.5 MHz TO 467.5 MHz





Channel	Channel No.1	
	Uplink	Downlink
Centre Frequency	455 MHz	465 MHz

APPENDIX B: INTERFERENCE RESOLUTION PROCESS

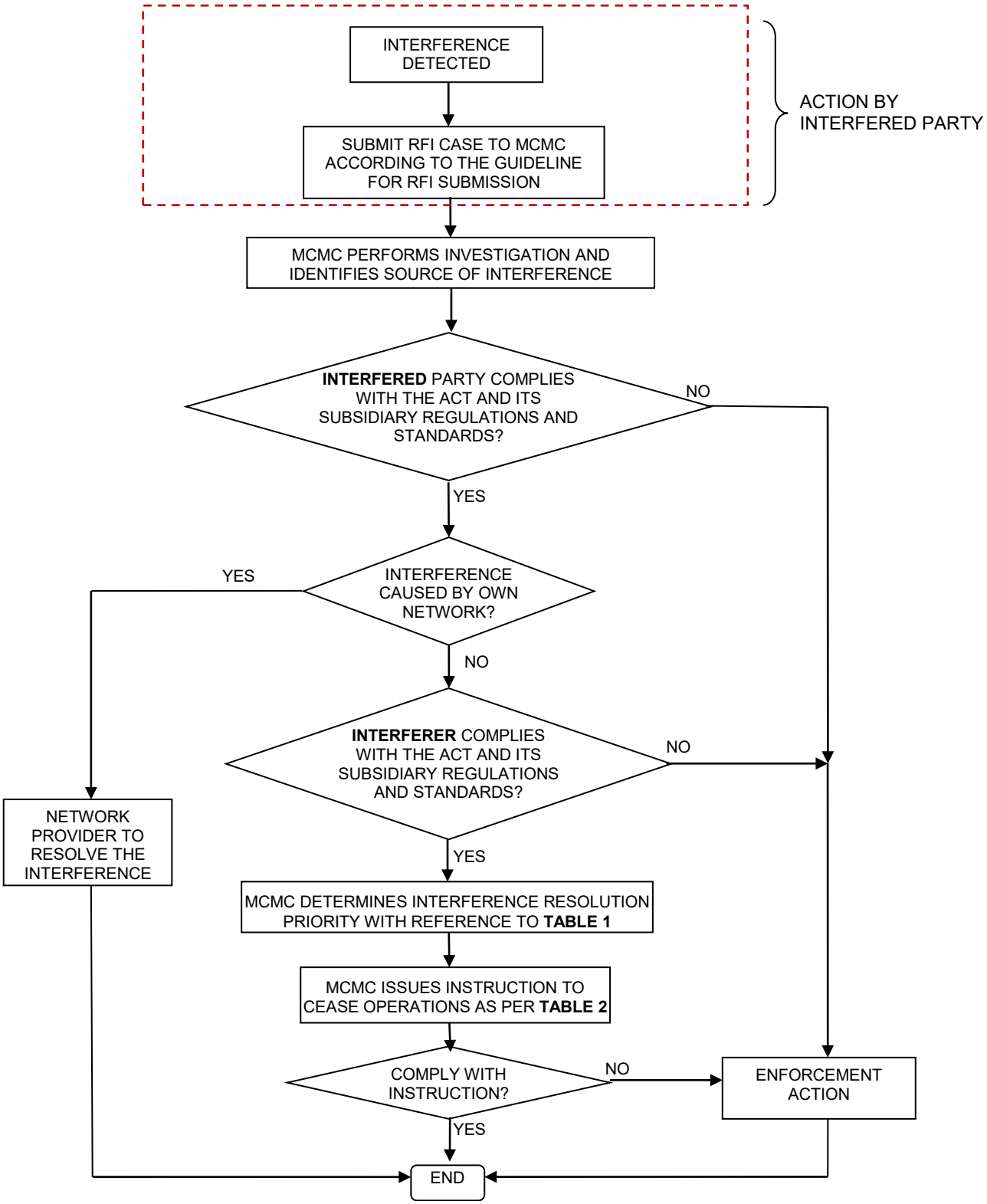


TABLE 1: INTERFERENCE RESOLUTION PRIORITY

No.	Resolution Type of Priority	Description
1	Service Priority	Primary services have priority over secondary services. Among co-primary or co-secondary services, the stated priority is accorded as in the Spectrum Plan.
2	Assignment Type Priority	SA and AA have equal priority but are of higher priority than CA.
3	Service Type Priority	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): i. safety or radionavigation service; and ii. based on the date of AA - Priority is given to the earliest/first installation.

TABLE 2: INTERFERENCE RESOLUTION TIMELINE TO PARTIES

No.	Types of interference	Description	Resolution Timeline
1	Harmful	Interference which endangers or seriously degrades, obstructs or repeatedly interrupts the functioning of a radionavigation service or one or more safety services operating in accordance with the Spectrum Regulations.	To cease* operation immediately within 24 hours or earlier as specified in the notice issued by MCMC.
2	Major	Electromagnetic interference rendering any apparatus or services unsuitable for their intended purpose or which degrades or obstructs, or repeatedly interrupts, a radiocommunications service operating in accordance with the Spectrum Regulations.	To cease* operation within 3 days or earlier as specified in notice issued by MCMC if interference cannot be resolved.
3	Minor	Electromagnetic interference which does not affect the overall operation of any radiocommunications transmission.	To cease* operation within 7 days or earlier as specified in the notice issued by MCMC if interference cannot be resolved.

*Note:
Resumption of operation of the apparatus is not allowed unless the assignment holder submit interference resolution or mitigation plan and has completed the implementation of the mitigation plan to the satisfaction of MCMC to remove/avoid the interference.