
Standard Radio System Plan

**REQUIREMENTS FOR
INTERNATIONAL MOBILE
TELECOMMUNICATIONS SYSTEMS
OPERATING IN THE FREQUENCY BANDS OF
1915 MHz TO 1980 MHz,
2010 MHz TO 2025 MHz,
AND
2110 MHz TO 2170 MHz**

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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 to provide information on the minimum technical and regulatory requirements for efficient use of the **1915 MHz to 1980 MHz, 2010 MHz to 2025 MHz and 2110 MHz to 2170 MHz** frequency 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 legislations made under the Act, the Act or the subsidiary legislation shall prevail.

2. ABBREVIATIONS

AA	Apparatus Assignment
CA	Class Assignment
CEPT	European Conference of Postal and Telecommunications Administrations
EIRP	Effective Isotropic Radiated Power
FDD	Frequency Division Duplex
IMT	International Mobile Telecommunications
ITU	International Telecommunication Union
ITU-R	ITU Radiocommunication Sector
LTE	Long Term Evolution
MIMO	Multiple Input Multiple Output
RFI	Radio Frequency Interference
SA	Spectrum Assignment
SRSP	Standard Radio System Plan
TDD	Time Division Duplex
TRP	Total Radiated Power
UMTS	Universal Mobile Telecommunications System
WCDMA	Wideband Code Division Multiple Access
WRC	World Radiocommunication Conference

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 utilization of IMT systems in Malaysia in the following frequency bands:
- i) FDD: **1920 MHz to 1980 MHz paired with 2110 MHz to 2170 MHz**; and
 - ii) TDD: **1915 MHz to 1920 MHz and 2010 MHz to 2025 MHz**.

The above frequency bands shall be referred to as the '**said bands**'.

- 3.3 The usage of the said bands is intended for providing wireless telecommunication connectivity to subscribers and may include applications such as voice, internet, video, images, interactive multimedia, high-speed data and mobile television.
- 3.4 The term IMT in this document is referred to IMT-2000 and IMT-Advanced systems collectively.

4. GENERAL

- 4.1 Technical characteristics of equipment used in IMT systems shall conform to all applicable Malaysian standards, international standards, ITU and its radio regulations as agreed and adopted by Malaysia.
- 4.2 All equipment installations must comply with the safety rules as specified in the applicable standards.
- 4.3 The equipment used shall be certified under the Communications and Multimedia (Technical Standards) Regulations 2000.
- 4.4 The allocation and assignment of the said bands and the information in this SRSP are subject to review from time to time to reflect new developments in the communications and multimedia industry.

- 4.5 FDD transmission may be combined with TDD transmission, in order to undertake the most effective and efficient use of the said bands.
- 4.6 Different technologies can co-exist within the said bands, thus allowing maximum utilization of the said bands subject to the requirements as set out in this SRSP.

5. CHANNEL ARRANGEMENT

- 5.1 The allocation of spectrum and services within the said bands is described in the Spectrum Plan.
- 5.2 The band plan for the said bands is as shown in **Table 1** below.

Duplex	Frequency Range (MHz)
FDD	1920 to 1980 (uplink)
	2110 to 2170 (downlink)
TDD	1915 to 1920 and 2010 to 2025

Table 1

- 5.3 For the deployment of IMT systems in the said bands, the channelling plan is as shown in **Appendix A**. The channelling plan is based on the radio frequency arrangement of the ITU-R Recommendation M.1036.
- 5.4 Assignment holders having contiguous blocks of **5 MHz** may have the flexibility of combining the carriers to support higher channel bandwidth for IMT systems. The implementation methods are subject to mitigation techniques deployed.

6. REQUIREMENTS FOR USAGE OF SPECTRUM

- 6.1 This SRSP covers the minimum key characteristics considered necessary in order to make the best use of the said bands.

- 6.2 The use of the said bands are only allowed for deployment of up to IMT-Advanced system.
- 6.3 The said bands are not limited in its use for direct radio connection between a radio base station and subscribers in a point-to-multipoint configuration. It should be further noted that the operation of IMT systems in the said bands is allowed without causing any interference to other services in the adjacent frequency bands. The coexistence and mitigation of interference may require adopting a number of engineering solutions based on industry best practise, guidelines and recommendations described in this SRSP.
- 6.4 Maximum radiated power and unwanted emission for IMT systems:
- 6.4.1 Base station
- 6.4.1.1 Base station in-block transmissions should not exceed **65dBm/5MHz EIRP**;
- 6.4.1.2 For MIMO deployment, the above EIRP value shall be applicable per transmit port;
- 6.4.1.3 On a case-by-case basis, higher EIRP value may be permitted if acceptable technical justification is provided; and
- 6.4.1.4 Unwanted emissions in out-of-band and spurious domain outside an assignment holder's assigned frequency blocks shall comply with the ITU-R Recommendation M.2070.
- 6.4.2 Mobile station
- 6.4.2.1 IMT mobile station transmission should not exceed **24dBm TRP** for mobile/nomadic terminal stations and should not exceed **24dBm EIRP** for fixed terminal stations; and
- 6.4.2.2 Unwanted emissions in out-of-band and spurious domain outside an assignment holder's assigned frequency blocks shall comply with the ITU-R Recommendation M.2071.

- 6.5 In some cases, a radio system conforming to the requirements of this SRSP may require modifications if major interference is caused to other radio communication stations or systems.
- 6.6 When an unwanted emission outside of an assigned frequency block causes harmful interference, MCMC may at its discretion, impose greater attenuation than specified in this section.
- 6.7 No frequency separation is required for coexistence requirement between WCDMA and LTE channel edges.
- 6.8 For systems operating within the TDD spectrum blocks, it shall be noted that:
 - 6.8.1 There is potential interference when two (2) assignment holders operate in adjacent channel blocks;
 - 6.8.2 The potential interference could be mitigated with synchronization between the assignment holders or by geographical separation; and
 - 6.8.3 In case there is a need to introduce guardband, it shall be within the designated spectrum block assigned to the assignment holder(s).

7. PRINCIPLES OF ASSIGNMENT

- 7.1 Authorisation to use the said bands for IMT base station(s) is by way of Spectrum Assignment (“SA”). The said bands are determined for SA under the Ministerial Determination on Spectrum Assignment No. 1 of 2002 and Ministerial Determination on Spectrum Assignment No. 1 of 2005.
- 7.2 The conditions that may be imposed by MCMC are the standard conditions for an assignment as specified in the Communications and Multimedia (Spectrum) Regulations 2000 and any additional conditions as may be imposed by MCMC.

8. IMPLEMENTATION

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

- 8.2 Noting that the deployment of new base station sites is an on-going process such as annual capacity enhancement of base station and new coverage deployment of base station, those base stations under development are taken into consideration in the coordination process. Coordination among operators may be required as recommended in Section 9 in order to minimize interference.

9. COORDINATION REQUIREMENT

- 9.1 Operator-to-operator coordination may be required to avoid interference.
- 9.2 In the event of any interference, MCMC will require the affected parties to carry out an operator-to-operator coordination. In the event that the interference remains unresolved after twenty-four (24) hours by the operators, the affected parties may escalate the matter to MCMC for a resolution. MCMC will decide the necessary modifications and schedule of modifications to resolve the interference. MCMC will be guided by the interference resolution process as shown in **Appendix B**.
- 9.3 Assignment holders are expected to take full advantage of interference mitigation techniques such as antenna discrimination, tilt, polarization, frequency discrimination, shielding/blocking (introduce diffraction loss), site selection, power control and/or filter installation to facilitate the coordination of systems.
- 9.4 The use of the said bands is subject to the coordination requirements with Malaysia's neighbouring countries for stations that are located at the border areas.
- 9.5 The agreed coordination requirement with Thailand for the frequency bands of **1920 MHz to 1980 MHz** paired with **2110 MHz to 2170 MHz** is as shown in **Table 2** below.

Band Plan	Full band sharing
Coordination Parameters	Based on ERC Recommendation 01-01 (ERC Rec.01-01): i. -78.69 dBm/5 MHz at the common border; and ii. -106.69 dBm/5 MHz at a distance of 6 km inside the neighbouring country.
Coordination Distance	6km from the common border. Agreed coordination distance serves as reference baseline for operator-to-operator coordination and interference resolution will be done on case-by-case basis.
Coordination Type	Through notification process. Notification of frequency assignment does not establish priority for interference protection. Interference resolution is to be handled on case-by-case basis.

Table 2

- 9.6 The agreed coordination requirement between Malaysia, Brunei and Singapore for the **said bands** is as shown in **Table 3** below.

Band Plan	Full band sharing
Coordination Parameters	As described in item 9.7 (Table 4)
Coordination Type	Operator-to-operator

Table 3

- 9.7 The border coordination parameters in **Table 4** below serves as reference baseline, to be used if operators among Malaysia, Singapore and Brunei are unable to come to an agreement on the:

9.7.1 Coordination parameters for existing and new homogeneous/heterogeneous mobile cellular technologies deployment; and

9.7.2 Mobile signal spillage reduction in any mobile cellular frequency bands.

Frequency Band (MHz)	Technology	At border (dBμV/m/5 MHz)	At defined distance from border	At 3km from border (dBμV/m/5 MHz)	Reference
1920 to 1980 paired with 2110 to 2170	UMTS vs UMTS FDD with preferential codes	65	37 dBμV/m/5 MHz at 6 km	45.5	ERC Rec. (01)01
	UMTS vs UMTS FDD with non-preferential codes	37	-	16	
1915 to 1920 and 2010 to 2025	UMTS vs UMTS TDD with preferential codes	37	-	16	
	UMTS vs UMTS TDD with non-preferential codes	21	-	0	

Table 4

9.8 When there is no agreed coordination zone, the zone within 50 km from the neighbouring countries will be used.

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

9.10 Agreement on the band plan from one neighbouring country to another may differ subject to the requirement of the respective country.

10. REVOCATION

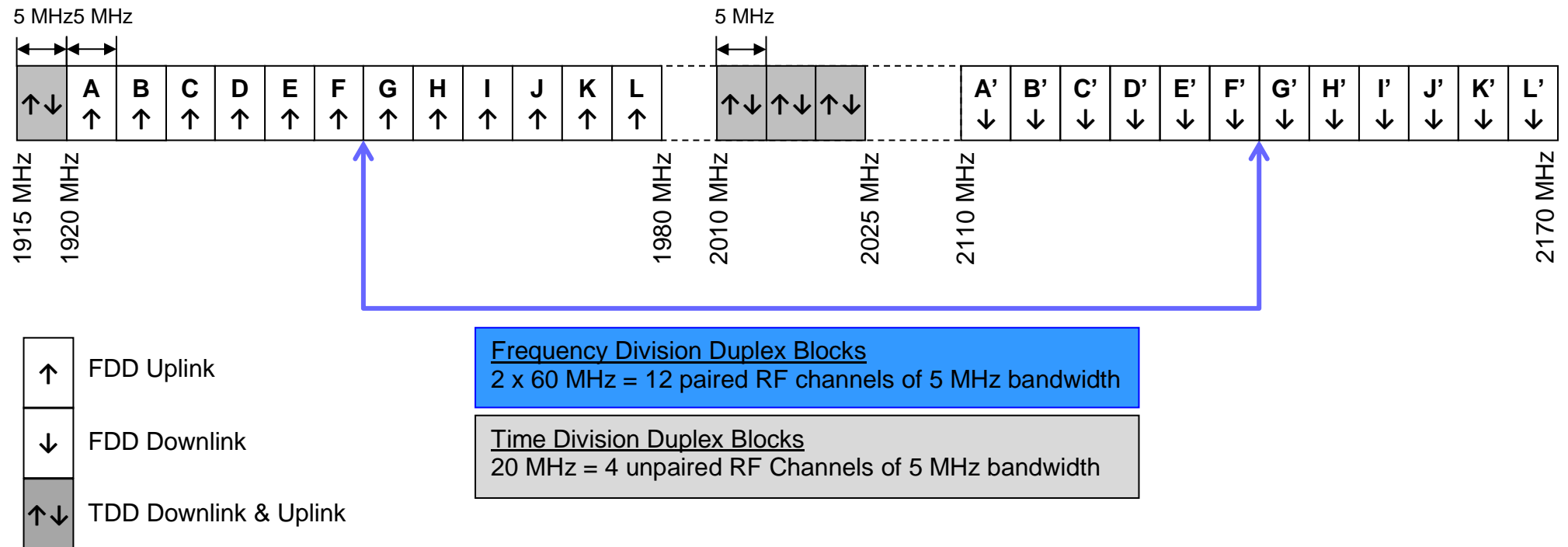
10.1 MCMC SRSP MS 2100, dated 3 May 2018 is hereby revoked.

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 (RR)
- iii) **Recommendation ITU-R M.1457** - Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)
- iv) **Recommendation ITU-R M.1580** - Generic unwanted emission characteristics of base stations using the terrestrial radio interfaces of IMT-2000
- v) **Recommendation ITU-R M.1581** - Generic unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT-2000
- vi) **Recommendation ITU-R M.2070** - Generic unwanted emission characteristic of base stations using the terrestrial radio interfaces of IMT-Advanced
- vii) **Recommendation ITU-R M.2071** - Generic unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT-Advanced
- viii) **ERC Recommendation 01-01** - Cross-border coordination for mobile/fixed communications networks (MFCN) in the frequency bands: 1920-1980 MHz and 2110-2170 MHz
- ix) **COMMISSION IMPLEMENTING DECISION 2012/688/EU** On the harmonisation of the frequency bands 1 920-1 980 MHz and 2 110-2 170 MHz for terrestrial systems capable of providing electronic communications services in the Union

APPENDIX A: CHANNEL ARRANGEMENT

CHANNEL ARRANGEMENT OF IMT SYSTEMS OF
1915 MHz TO 1980 MHz, 2010 MHz TO 2025 MHz, AND 2110 MHz TO 2170 MHz



APPENDIX B: INTERFERENCE RESOLUTION PROCESS

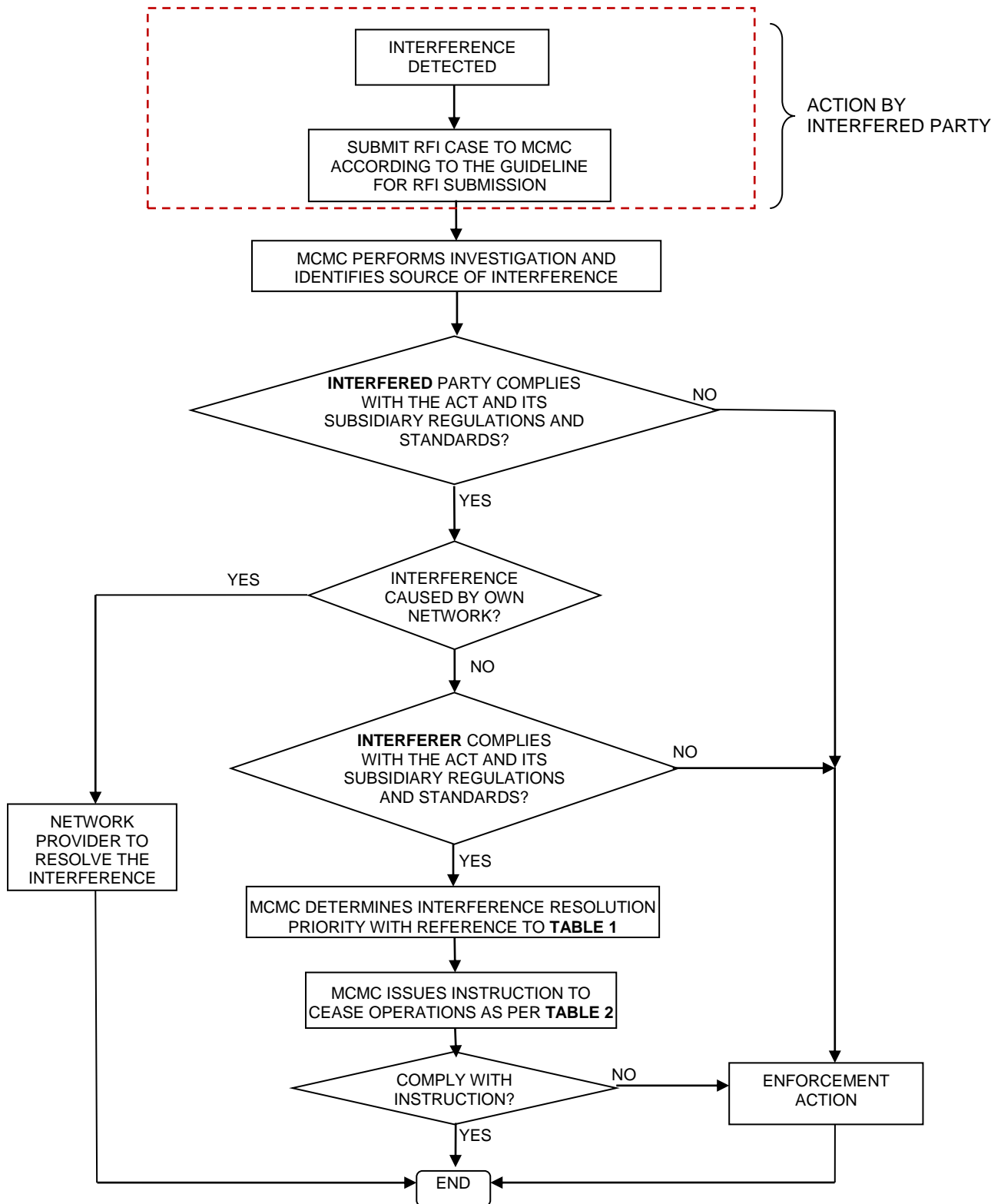


TABLE 1: INTERFERENCE RESOLUTION PRIORITY

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 provided 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 Communications and Multimedia (Spectrum) Regulations 2000.	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. For this purpose interference to public correspondence service is considered under this category.	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.