



**MCMC SRSP FS 5.925
26 DECEMBER 2023**

Standard Radio System Plan

**REQUIREMENTS FOR
FIXED WIRELESS SYSTEMS
OPERATING IN THE FREQUENCY BAND OF
5925 MHz TO 6425 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 the Spectrum Plan (“**Spectrum Plan**”) to provide information on the minimum technical and regulatory requirements for the efficient use of the **5925 MHz to 6425 MHz** frequency band.
- 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
EIRP	Equivalent Isotropic Radiated Power
FACSMAB	Frequency Assignment Committee of Singapore, Malaysia and Brunei Darussalam
FS	Fixed Service
FSS	Fixed- Satellite Service
FWS	Fixed Wireless System
GHz	Gigahertz
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
MHz	Megahertz
MS	Mobile Service
NFP(I)	Network Facilities Provider (Individual)
RF	Radio Frequency
RR	Radio Regulations
SA	Spectrum Assignment
SRSP	Standard Radio System Plan

TRILATERAL Trilateral Coordination Meeting between the Republic of Indonesia,
Malaysia and Singapore

VSAT Very Small Aperture Terminal

3. INTENT

- 3.1 This SRSP is intended to ensure efficient provision of FWS in Malaysia with minimal service disruption and RF interference among the service providers.
- 3.2 This SRSP provides the minimum requirements for the utilisation of FWS in the frequency band of **5925 MHz to 6425 MHz** (“said Band”) for the digital transmission of FWS.
- 3.3 The intended use of this FWS is mainly for trunk/main link only. However, the use of FWS for mini/spur link may be considered on a case-by-case basis.

4. GENERAL

- 4.1 Technical characteristics of the FWS equipment shall conform to all applicable Malaysian standards and international standards including the ITU and its RR as agreed and adopted by Malaysia.
- 4.2 Although the system shall conform to the requirements of this SRSP, MCMC may require that modifications be made to the system whenever interference is caused or is likely to be caused to other radio stations or systems of services as listed in the Spectrum Plan.
- 4.3 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.
- 4.4 All FWS communications equipment installations shall comply with the safety rules and other requirements as specified in the applicable standards.

- 4.5 The communications equipment used shall be certified under the Communications and Multimedia (Technical Standards) Regulations 2000.
- 4.6 The allocation, requirements and information in respect of the said Band as provided in this SRSP are subject to further review by MCMC from time to time to reflect new developments in the communications and multimedia industry.

5. CHANNEL ARRANGEMENT

- 5.1 The allocation of services within the said Band is described in the Spectrum Plan.
- 5.2 The RF channel arrangement of this SRSP is based on the RF channel arrangement in the **Recommendation ITU-R F.383**. The assignment holders are encouraged to refer to the latest version of the recommendation document(s) published on the ITU-R website.
- 5.3 The RF channel arrangement shall be up to eight (8) of 29.65 MHz transmit and receive channels with each channel accommodating a capacity of the order of synchronous digital hierarchy bit rates or equivalent or higher data rate traffic as shown in **Figures 1A** of **APPENDIX A** of this SRSP and should be derived as follows:

Let:

f_0 be the frequency of the centre of the band of frequencies occupied (MHz), where $f_0 = 6175.0$ MHz;

f_n be the centre frequency of one (1) RF channel in the lower half of

the

frequency band (MHz);

f'_n be the centre frequency of one (1) RF channel in the upper half of the frequency band (MHz),

Note:

- i. Separation between adjacent channels = 29.65 MHz
- ii. Separation between corresponding transmit and receive channels = 252.04 MHz

The frequencies of individual channels are expressed by the following relationships:

lower half of the band: $f_n = f_0 - 259.45 + 29.65 n \text{ MHz}$

upper half of the band: $f'_n = f_0 - 7.41 + 29.65 n \text{ MHz}$

where:

$$n = 1, 2, 3, 4, 5, 6, 7 \text{ or } 8.$$

- 5.4 The standard channel arrangement is as shown in **Table 1** of **APPENDIX A** of this SRSP.

6. REQUIREMENTS FOR USAGE OF SPECTRUM

- 6.1 This SRSP covers the minimum key characteristics considered necessary in order to make the use of the said Band.
- 6.2 The minimum path length requirement for FWS in the said Band **shall be 20 km.**
- 6.3 The use of other than minimum path length requirement as stated in paragraph 6.2 will be treated on a case-by-case basis by MCMC.
- 6.4 The use of the said band shall comply with the transmit and receive based on channel arrangement shown in **Table 1** of **APPENDIX A** of this SRSP.

- 6.5 The above channel arrangement primarily provides for eight (8) transmit and eight (8) receive radio frequency channels on the same route.
- 6.6 In a digital radio system, it is possible to accommodate the transmit and receive channels on a single antenna. The transmit and receive channels on a given section should preferably use polarisations as shown in **Figure 1A** and **Table 2** of **APPENDIX A** of this SRSP.
- 6.7 In the past deployment of analogue systems of up to 1800 channels, the alternative arrangement of polarisation, as shown in **Figure 1B** and **Table 3** of **APPENDIX A** of this SRSP has been used and may possibly be maintained in the initial migration to the digital system.
- 6.8 When the equipment and network characteristics permit, co-channel frequency reuse of the arrangement in **Figure 1C** of **APPENDIX A** of this SRSP can be employed for improving spectral efficiency.
- 6.9 When very high-capacity links are required, channel width of 59.30 MHz should be used as below:

$$\text{lower half of the band: } f_n = f_0 - 274.275 + 59.30 n \text{ MHz}$$

$$\text{upper half of the band: } f'_n = f_0 - 22.235 + 59.30 n \text{ MHz}$$

where:

$$n = 1, 2, 3, 4.$$

- 6.10 The channel arrangement is as shown in **Figure 2** and **Table 4** of **APPENDIX A** of this SRSP.
- 6.11 Protection channel may be permitted for multi-channel systems provided that it is duly approved by MCMC with the issuance of an AA.
- 6.12 It should be noted that FS, FSS and MS share co-primary service allocation in the said Band and is of the same primary status with stations operating in the FSS and MS. Currently the said Band is also used for FSS uplink for VSAT and hub operations.
- 6.13 FWS in the FS shall not interfere with the earth stations of FSS in the said Band. As such, it shall comply with **Recommendation ITU-R SF.765**, and **Recommendation ITU-R SM.1540, Article 21** of the ITU RR.
- 6.14 Special care shall be taken by FWS service providers during the network planning stage and installation of their communications equipment to avoid any interference to and from other primary services. The FWS service providers shall take full advantage of interference mitigation techniques such as antenna discrimination, antenna tilting, antenna polarisation, frequency discrimination, shielding/blocking (introduction of diffraction loss), site selection, and/or power control to facilitate coordination of the relevant systems.
- 6.15 FWS receiving stations operating in the said Band should avoid directing their antennas towards the geostationary-satellite orbit and earth stations. It is recommended to maintain a geographical separation between earth stations and terrestrial stations as indicated in **Article 21** of the RR.

- 6.16 In the event that the FWS causes interference to other primary services, and the affected party files a written report to MCMC for a resolution, MCMC will decide the necessary modifications to resolve the interference dispute. MCMC will be guided by the interference resolution process as shown in **APPENDIX B** of this SRSP.

7. PRINCIPLES OF ASSIGNMENT

- 7.1 Authorization of the use of the said band for FWS station shall by way of an AA.
- 7.2 The eligibility criteria of applicants for submission of AA applications are as follows:
- 7.2.1 NFP(I) licence holder, which owns or provides radiocommunications transmitters and links; or
 - 7.2.2 Private network facility (Government and private corporations or companies) for private use only.
- 7.3 For use by private network facility other than offshore, the applicant shall provide proof that the existing NFP(I) licence holders are not able to provide FWS station to the said applicant.
- 7.4 Applicants are required to submit:
- 7.4.1 AA application for the apparatus by using the prescribed AA form in accordance with the Act, relevant subsidiary legislations including the Communications and Multimedia (Spectrum) Regulations 2000 ("**Spectrum Regulations**"), Spectrum Plan and any relevant instruments issued by MCMC including any amendments made to the same; and

- 7.4.2 any other documents and/or information that may be requested by MCMC.
- 7.5 The AA shall be subject to all conditions as specified in regulations 9, 10 and 22 of the Spectrum Regulations and any further assignment conditions as may be imposed by MCMC from time to time.
- 7.6 The issuance of an AA will be subject to technical analysis and evaluation conducted by MCMC. If necessary, operator-to-operator coordination at defined geographic boundaries may be required to reduce possibility of interference.
- 7.7 An applicant is encouraged to conduct frequency coordination among existing assignment holder of FWS stations in the same frequency band prior to the submission of the AA application.
- 7.8 The AA shall be assigned based on a first-come, first-served basis.

8. COORDINATION REQUIREMENT

8.1 The use of the said Band shall require coordination with the neighbouring countries within the following coordination zones and shall be subject to the following agreed operational limit:

Border Agreement	Maximum EIRP (dBW)	Coordination Distance
FACSMAB	< 40 dBW	30 km
	> 40 dBW	50 km
JTC	Not Applicable	35 km
TRILATERAL	< 40 dBW	30 km
	> 40 dBW	50 km

Table 5: Coordination zone and band plan for neighbouring countries

8.2 In the event there is no agreement on coordination zone, a zone within 50 km from the border of the neighbouring countries will be applied.

8.3 It shall be noted that the coordination zones and parameters are continuously being reviewed with Malaysia's neighbouring countries and may be updated from time to time.

8.4 Issuance of an AA is also subject to successful coordination with the above neighbouring countries, where applicable.

8.5 The technical mitigation guide as mentioned in paragraphs 6.14 to 6.16 above shall be applied if operator-to-operator coordination is required.

8.6 In the event of any interference, the affected assignment holder shall carry out an operator-to-operator coordination and frequency scanning. If the interference remains unresolved after 24 hours, the affected parties may escalate the matter to MCMC for a resolution. MCMC will decide on the necessary modifications and schedule of modifications to resolve the interference dispute. MCMC will be guided by the interference resolution process as shown in **APPENDIX B** of this SRSP.

9. IMPLEMENTATION

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

9.2 Any FWS installed or purchased prior to the effective date of this SRSP may be allowed to operate, subject to the issuance of an AA by MCMC.

9.3 Any new FWS after the issuance of this SRSP, shall adhere to the requirements as set out in section 6 of this SRSP.

10. REVOCATION

10.1 The MCMC SRSP FS 5.925 dated 10 October 2017 is hereby revoked.

11. REFERENCES

- i. **Spectrum Plan**
- ii. **Recommendation ITU-R F.383** Radio-frequency channel arrangements for high-capacity fixed wireless systems operating in the lower 6 GHz (5925 MHz to 6425 MHz) band

- iii. **Recommendation ITU-R F.592** Vocabulary of terms for the fixed service
- iv. **Recommendation ITU-R F.746** Radio-frequency arrangements for fixed service systems
- v. **Recommendation ITU-R SM.1540** Unwanted emissions in the out-of-band domain falling into adjacent allocated bands
- vi. **ITU Radio Regulations Article 21** Terrestrial and space services sharing frequency bands above 1 GHz

APPENDIX A: CHANNEL ARRANGEMENT

RF channel arrangements for FWS operating in the 5925 MHz to 6425 MHz frequency band:

Figure 1A

Alternated channel arrangement
(All frequencies in MHz)

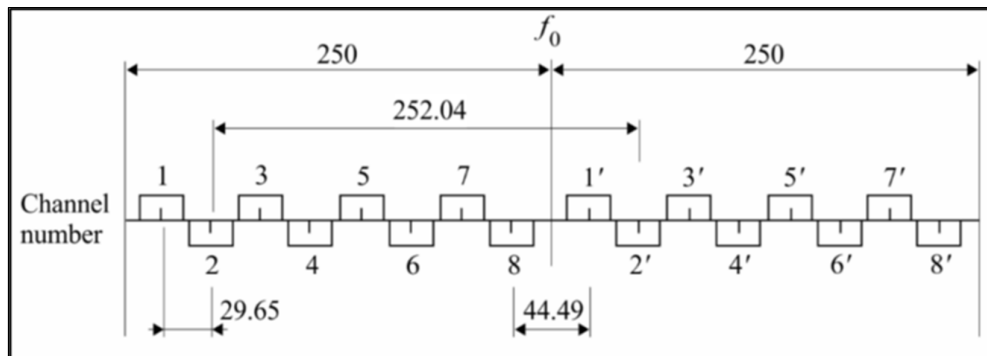


Table 1

RF Carrier Centre Frequencies
(bandwidth = 29.65 MHz)

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	5945.200	1'	6197.240
2	5974.850	2'	6226.890
3	6004.500	3'	6256.540
4	6034.150	4'	6286.190
5	6063.800	5'	6315.840
6	6093.450	6'	6345.490
7	6123.100	7'	6375.140
8	6152.750	8'	6404.790

Table 2

Polarization	Transmit channel				Receive channel			
H(V)	1	3	5	7	1'	3'	5'	7'
V(H)	2	4	6	8	2'	4'	6'	8'

Figure 1B
 Alternated channel arrangement
 (All frequencies in MHz)

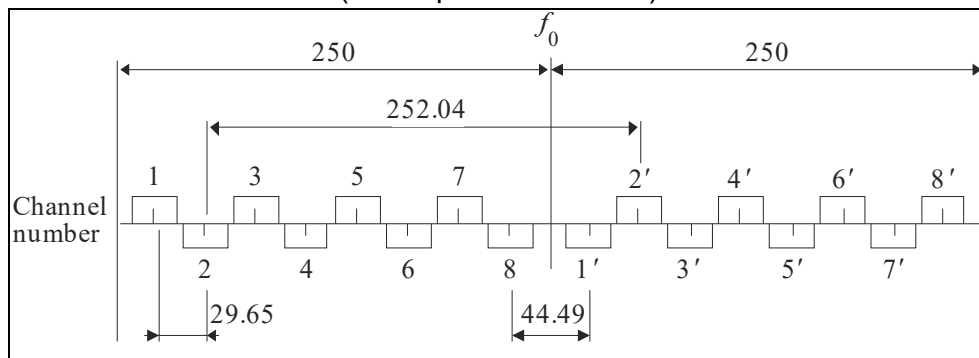


Table 3

Polarization	Transmit channel				Receive channel			
H(V)	1	3	5	7	2'	4'	6'	8'
V(H)	2	4	6	8	1'	3'	5'	7'

Figure 1C
 RF Co-channel Arrangement in high capacity FWS
 (All frequencies in MHz)

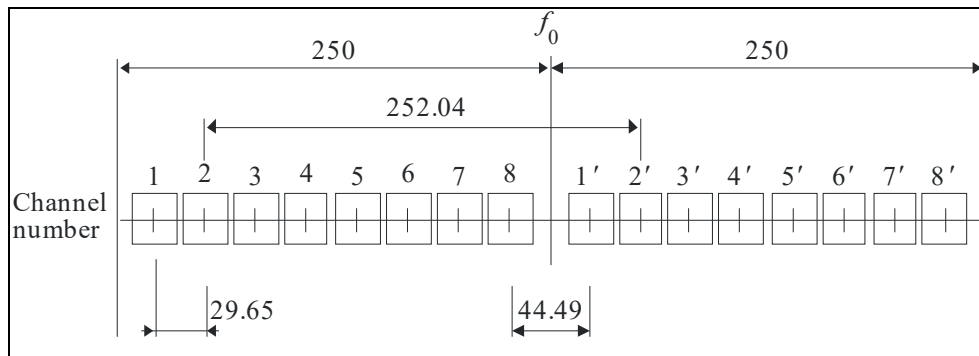


Figure 2
 59.3 MHz radio-frequency channel arrangement for radio-relay systems
 operating in the lower 6 GHz band
 (All frequencies in MHz)

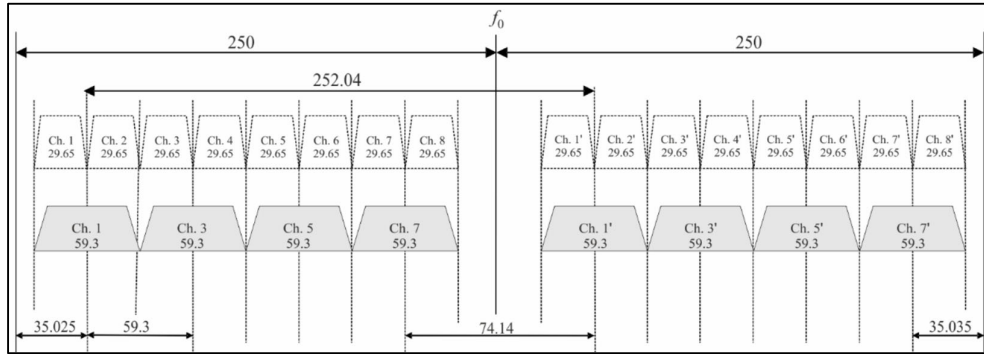


Table 4
 RF Carrier Centre Frequencies
 (bandwidth = 59.30 MHz)

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	5960.025	1'	6212.065
2	6019.325	2'	6271.365
3	6078.625	3'	6330.665
4	6137.925	4'	6389.965

APPENDIX B: INTERFERENCE RESOLUTION PROCESS

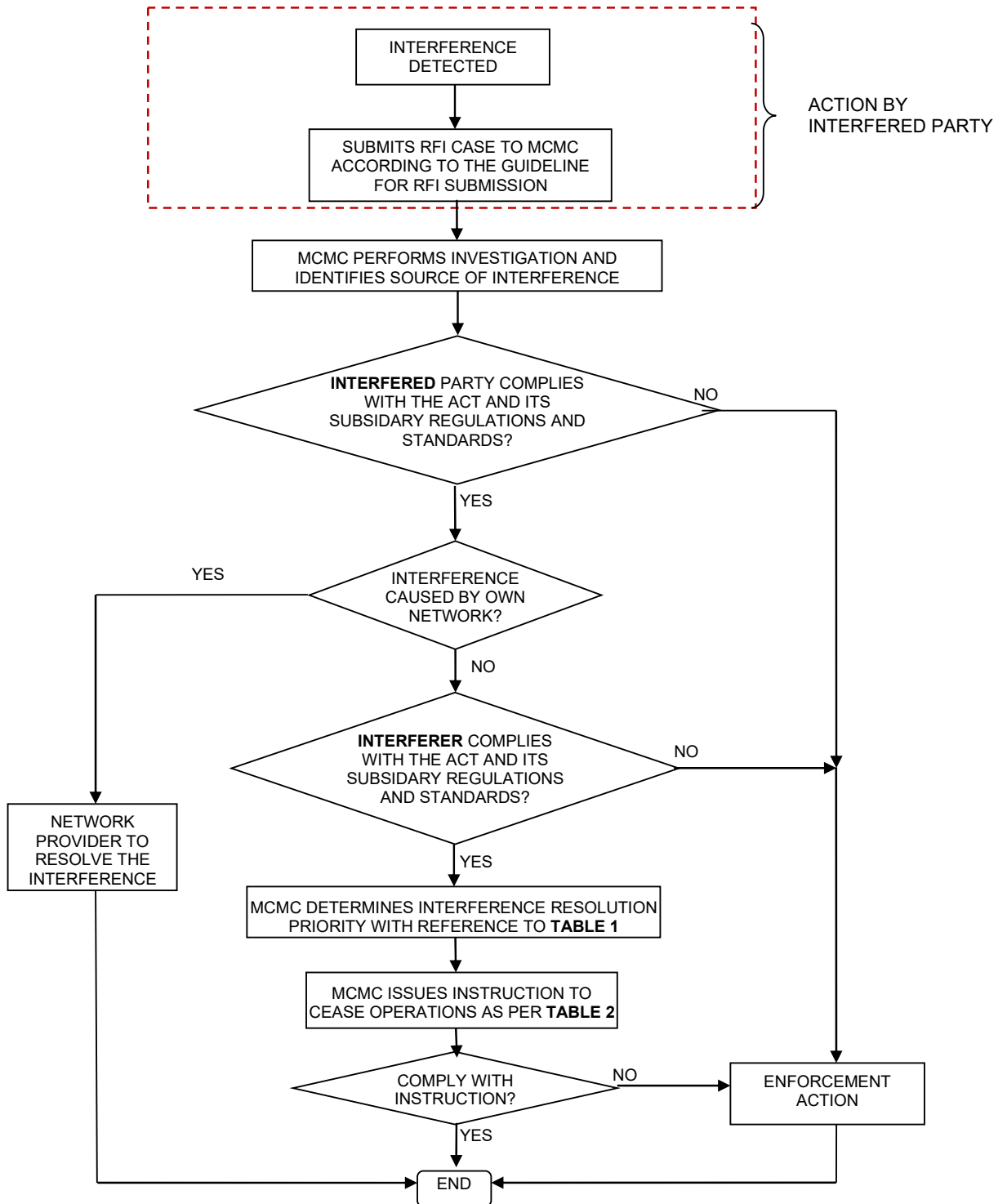


TABLE 1: INTERFERENCE RESOLUTION PRIORITY

	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): <ul style="list-style-type: none"> i. safety or radionavigation service; and ii. based on the date of the AA - Priority is given to the earliest/first installation.

TABLE 2: INTERFERENCE RESOLUTION TIMELINE TO PARTIES

	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 service unsuitable for its purpose or which degrades or obstructs, or repeatedly interrupts any other radiocommunications service operating, in accordance with the Spectrum Regulations.	To cease* operation within 3 days or earlier as specified in the 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 submits an interference resolution or a mitigation plan and has completed the implementation of the mitigation plan to remove/avoid the interference to the satisfaction of MCMC.