MCMC SRSP-548 FS

26 December 2013

Standard Radio System Plan

REQUIREMENTS FOR FIXED SERVICE LINE-OF-SIGHT RADIO-RELAY SYSTEMS

OPERATING IN THE FREQUENCY BANDS OF

71.000 GHz TO 76.000 GHz

AND

81.000 GHz TO 86.000 GHz

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1.0 FOREWORD

1.1 This Standard Radio System Plan ('SRSP') is prepared by the Malaysian Communications and Multimedia Commission (the 'Commission') to provide information on the minimum technical and regulatory requirements for the efficient use of allocated frequency bands as described in the Spectrum Plan – an extract is illustrated in **Appendix A**.

1.2 This SRSP specifies the characteristics of radio systems, frequency channelling and coordination initiatives in maximising the utilisation of the allocated frequency bands and minimising interference.

1.3 This SRSP is intended to regulate the use of the allocated frequency bands and does not attempt to establish any detailed equipment standards.

2.0 INTENT

2.1 This SRSP states the requirements for the utilisation of frequency bands 71.000 GHz to 76.000 GHz and 81.000 GHz to 86.000 GHz (the 'allocated frequency bands') forFixed Service ('FS') line-of-sight radio-relay systems in Malaysia.

2.2 FS line-of-sight radio-relay systems in these allocated band frequency bands are mainly intended to provide ultra-high capacity point-to-point communications, capable to offer full duplex connectivity at bit rates of 1Gbps (Gigabit per second) and above for telephony, data, video and television signals.

3.0 GENERAL

3.1 Equipment(s) to be used for the FS line-of-sight radio-relay systems in the allocated frequency bands shall:

3.1.1 Conform with the Communications and Multimedia Act 1998 ("Act") and its subsidiary legislation made under the Act;

3.1.2 Conform with the requirements, specifications and standards (any Malaysian standard, International standards, technical standards, mandatory standards and technical codes registered by the Commission) that apply to the systems as decided by the Commission; and

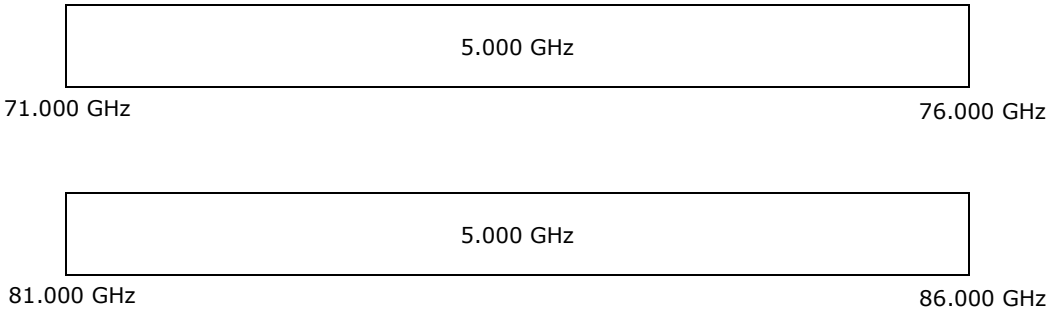
3.1.3 Be certified by the Commission or its registered certifying agency and bear a proper SKMM certification label in accordance with the Communications and Multimedia (Technical Standards) Regulation 2000.

3.2 The installation of the equipment(s) shall comply with the relevant safety rules as provided in the applicable standards stated in paragraph 3.1.2 above.

3.3 This SRSP is not exhaustive and may be reviewed by the Commission from time to time to reflect the new development in the country's communications and multimedia industry.

4.0 CHANNELLING PLAN

4.1 The channelling plan has been designed according to the Recommendation ITU-R F.2006. The channelling plan for the frequency bands of 71.000 GHz to 76.000 GHz and 81.000 GHz to 86.000 GHz are as shown below:



4.2 In order to provide high capacity link via FDD or TDD technique, issuance of an assignment will be based on a single channelling plan of 5.000 GHz bandwidth. The issuance of an assignment shall be made based on the channelling plan in **Appendix B.**

5.0 REQUIREMENTS FOR USAGE OF SPECTRUM

5.1 This SRSP covers the minimum key characteristics considered necessary to make the best use of the available frequencies.

5.2 These allocated frequency bands are not limited in their use for direct radio connection between a radio fixed station and subscribers in a point-to-point configuration. It may also be used for backhaul links from a base station to an exchange.

5.3 Only systems using digital technologies that promote spectral efficiency will be issued with an assignment. Capacity enhancing digital techniques is being developed rapidly and such techniques that promote efficient use of spectrum, without reducing the quality of service are encouraged.

5.4 A radio system conforming to the requirements of this SRSP may require modifications if harmful interference is caused to other radio stations of the same service within the same band, and/or other radio stations or systems of other services within the same band, and/or other radio stations or systems of other services in the adjacent bands.

5.5 Maximum equivalent isotropically radiated power (e.i.r.p.):

5.5.1 FS line-of-sight radio-relay link station transmission EIRP shall not exceed +55 dBW.

5.6 It should be noted that the Earth Exploration Satellite Service (EESS) operates in the band of 86 GHz to 92 GHz. The assignment holders shall take all reasonable steps to ensure that unwanted emissions of FS stations in the frequency band from 81 GHz to 86 GHz do not exceed the recommended maximum levels contained in ITU-R Resolution 750.

5.7 The allocation of spectrum and shared services within these bands are found in the Spectrum Plan and an extract of it is shown in **Appendix A**. Priority of an assignment of these shared services will be based on first come first serve basis.

6.0 PRINCIPLES OF ASSIGNMENT

6.1 Authorisation to use the allocated frequency bands for line-of-sight radio-relay systems is by way of Apparatus Assignment (AA) and shall be on a first come first serve basis.

6.2 Eligible persons who may apply for assignments are:

6.2.1 Network Facilities Provider Individual (NFP (I)) licence holder, who provides radiocommunication transmitters and links.

6.2.2 Network Facilities Provider Class (NFP (C)) licence holder, who provides radiocommunication transmitters and links.

6.2.3 Private network facility (Government and private corporations/companies) for own inland and/or offshore private use only.

6.3 Applicants are required to submit AA application for the apparatus on the prescribed AA forms.

6.4 Issuance of AA is subject to successful coordination among assigned stations and with neighbouring administrations where it applies.

6.5 Applicant is encouraged to coordinate among existing stations prior to submission of AA application.

7.0 IMPLEMENTATION

7.1 This SRSP shall be effective on the date of its issuance.

8.0 COORDINATION REQUIREMENT

8.1 The use of these frequency bands within the coordination zones shall require coordination with the neighbouring countries. The coordination zones are based on agreements reached at the committees namely FACSMAB[1], JTC[2] and JCC[3]. FACSMAB and JTC have defined the coordination parametersas below:

Committee	Neighbouring Country	Coordination Zone	Frequency Band
FACSMAB	Brunei Darussalam & Singapore	2 km	Full Band Sharing
JTC	Thailand	5 km	Full Band Sharing

8.2 Where there are no agreed coordination parameters, a zone of within 50 km from our neighbouring countries will be applicable.

[1]FACSMAB - Frequency Assignment Committee Singapore, Malaysia and Brunei Darussalam
[2]JTC - Joint Technical Committee on Coordination and Assignment of Frequencies along Malaysia - Thailand Common Border
[3]JCC - Joint Committee on Communications between The Republic of Indonesia and Malaysia

8.3 Noting that these coordination parameters are continuously being reviewed by the committees, the coordination parameters may be updated from time to time. As such, the Commission reserves the right to reassign the affected frequency channels at border coordination areas.

8.4 Technical analysis shall be carried out by the Commission before AA is issued. AA for FS line-of-sight radio-relay is issued based on station location to provide service to a specific geographical area. Operator-to-operator coordination at the specific geographical area and its boundaries may be required to avoid interference.

8.5 In the event of any interference, the Commission will require an operator-to-operator coordination to be carried out. In the event the interference remains unresolved after 24 hours, the matter may be escalated to the Commission for resolution. The Commission will decide the necessary modifications and schedule of modifications to resolve the interference. The Commission shall be guided by the interference resolution process as shown in **AppendixC**.

8.6 AA holders are expected to carry on interference mitigation techniques such as antenna discrimination, tilt, polarization, frequency discrimination, shielding/blocking (introduce diffraction loss), site selection, distance and/or power control in order to facilitate the coordination of systems.

9.0 REFERENCES

[1] Spectrum Plan.

[2] **Article 21 of ITU Radio Regulations** on Terrestrial and space services sharing frequency bands above 1 GHz.

[3] **ITU-R Resolution 731** on Consideration of sharing and adjacent-band compatibility between passive and active services above 71 GHz.

[4] **ITU-R Resolution 732** on Consideration of sharing between active services above 71 GHz.

[5] **ITU-R Resolution 750** on Compatibility between the Earth exploration-satellite service (passive) and relevant active services.

[6] **Recommendation ITU-R F.2006** on Radio-frequency channel and block arrangements for fixed wireless systems operating in the 71-76 and 81-86 GHz bands.

[7] **Report ITU-R F.2239** on Coexistence between fixed service operating in 71-76 GHz, 81-86 GHz and 92-94 GHz bands and passive services.

[8] **ECC/REC(05)07** on Radio Frequency Channel Arrangement for Fixed Service Systems Operating in the Bands 71-76 GHz and 81-86 GHz.

[9] **ECC REPORT 124** on Coexistence between Fixed Service Operating in 71-76 / 81-86 GHz and the passive services.

[10] **ETSI TS 102 524** on Fixed Radio Systems; Point-to-Point equipment; Radio equipment and antennas for use in Point-to-Point Millimetre wave applications in the Fixed Services (mmwFS) frequency bands 71 GHz to 76 GHz and 81 GHz to 86 GHz.

[11] **FCC OET Bulletin 65** on Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.

Issued by:
Malaysian Communications and Multimedia Commission
Date: 26 December 2013

APPENDIX A: TABLE OF FREQUENCY ALLOCATION 71 GHz to 76 GHz and 81 GHz to 86 GHz

Frequency Band (GHz)	ITU Allocation			Malaysian Allocation
	Region 1	Region 2	Region 3	
71-74	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)			FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)
74-76	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth) 5.561			FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth) 5.561
81-84	FIXED 5.338A FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space research (space-to-Earth) 5.1495.561A			FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space research (space-to-Earth) 5.149 5.561A

84-86	FIXED 5.338A FIXED-SATELLITE (Earth-to-space) 5.561B MOBILE RADIO ASTRONOMY 5.149	FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY 5.149

5.149 In making assignments to stations of other services to which the bands:

13 360-13 410 kHz,
25 550-25 670 kHz,
37.5-38.25 MHz,
73-74.6 MHz in Regions 1 and 3,
150.05-153 MHz in Region 1,
322-328.6 MHz,
406.1-410 MHz,
608-614 MHz in Regions 1 and 3,
1 330-1 400 MHz,
1 610.6-1 613.8 MHz,
1 660-1 670 MHz,
1 718.8-1 722.2 MHz,
2 655-2 690 MHz,
3 260-3 267 MHz,
3 332-3 339 MHz,
3 345.8-3 352.5 MHz,
4 825-4 835 MHz,
4 950-4 990 MHz,
4 990-5 000 MHz,
6 650-6 675.2 MHz,
10.6-10.68 GHz,
14.47-14.5 GHz,
22.01-22.21 GHz,
22.21-22.5 GHz,
22.81-22.86 GHz,
23.07-23.12 GHz,
31.2-31.3 GHz,
31.5-31.8 GHz in Regions 1 and 3,
36.43-36.5 GHz,
42.5-43.5 GHz,
48.94-49.04 GHz,
76-86 GHz,
92-94 GHz,
94.1-100 GHz,
102-109.5 GHz,
111.8-114.25 GHz,
128.33-128.59 GHz,
129.23-129.49 GHz,
130-134 GHz,
136-148.5 GHz,
151.5-158.5 GHz,
168.59-168.93 GHz,
171.11-171.45 GHz,
172.31-172.65 GHz,
173.52-173.85 GHz,
195.75-196.15 GHz,
209-226 GHz,
241-250 GHz,
252-275 GHz

are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from space borne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. **4.5** and **4.6** and Article **29**). (WRC-07)

5.338A In the bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 30-31.3 GHz, 49.7-50.2 GHz, 50.4-50.9 GHz, 51.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution **750 (Rev.WRC-12)** applies. (WRC-12)

5.561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service. (WRC-2000)

5.561A The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary basis. (WRC-2000)

APPENDIX B: CHANNELLING PLAN FOR FIXED SERVICE LINE-OF-SIGHT RADIO-RELAY SYSTEMS OPERATING IN THE FREQUENCY BANDS OF 71 GHz TO 76 GHz AND 81 GHz TO 86 GHz

BLOCK NUMBER	FREQUENCY RANGE (GHz)	AVAILABLE BANDWIDTH (GHz)	CENTRE FREQUENCY (GHz)
A	71.000 – 76.000	5.000	73.500

BLOCK NUMBER	FREQUENCY RANGE (GHz)	AVAILABLE BANDWIDTH (GHz)	CENTRE FREQUENCY (GHz)
B	81.000 – 86.000	5.000	83.500

APPENDIX C: INTERFERENCE RESOLUTION PROCESS

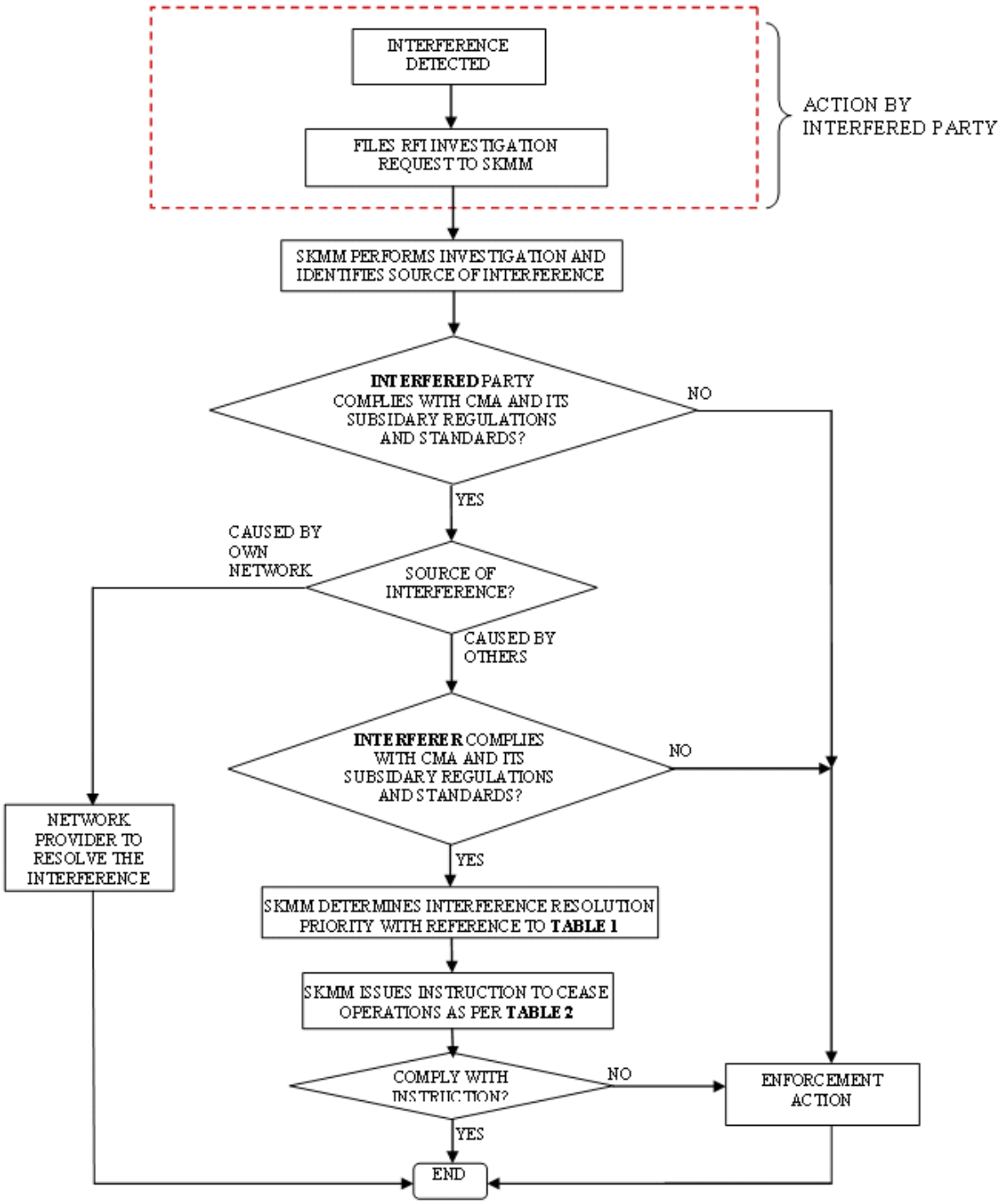


Table 1: INTERFERENCE RESOLUTION PRIORITY

	Resolution Type of Priority	Description
1	Service Priority	Primary has 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	Spectrum Assignment (SA) and Apparatus Assignment (AA) have equal priority but are of higher priority than Class Assignment (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; ii. Based on the Date of Apparatus Assignment - 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 CMA (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 complete implementation of the mitigation plan to the satisfaction of MCMC to remove/ avoid the interference.