



ITU-APT Foundation of India (IAFI¹)

UPDATES TO WORKING DOCUMENT TOWARDS NEW APT REPORT ON PMSE FREQUENCY USAGE IN THE 470-806 MHZ BAND IN ASIA PACIFIC REGION

1. Background

The questionnaire, was initiated in AWG-30, focused on the use of the 470-806 MHz band for Programme Making and Special Events (PMSE) in the Asia-Pacific region. Aimed at collecting regulatory and usage data on PMSE equipment. Key aspects included the types of PMSE equipment in use, existing regulatory frameworks, and the need for frequency harmonization across APT member countries.

2. Introduction

The usage of the 470-806 MHz radio spectrum for Programme Making and Special Events (PMSE) in the Asia-Pacific region is undergoing critical evaluation. PMSE, encompassing a diverse range of multimedia applications, from audio-video content broadcasting to support for various public events like concerts and sports, plays a crucial role in the multimedia industry.

Programme Making and Special Events (PMSE) equipment is meant for use in applications identified in various publications as Services Ancillary to Programme making (SAP), Services Ancillary to Broadcasting (SAB), Electronic News Gathering (ENG) / Outside Broadcasting (OB) and Broadcast Auxiliary Systems (BAS). PMSE includes wireless applications used in professional audio/video productions such as concerts, musicals, or other staging of entertainment, meetings, conferences, cultural and educational activities, trade fairs, sport, religious, and other public or private events.

3. Proposal

PMSE is an important incumbent in 470-806 MHz worldwide. We are looking forward to seeing additional replies from administrations in the Asia-Pacific region to the PMSE questionnaire.

While this questionnaire is looking at PMSE frequency usage, we would like to encourage APT members to also assess the overall benefits of PMSE applications for their respective cultural and creative industry (CCI) in their future national economy development plan.

This contribution provides some information on wireless applications of PMSE as additional background information to be added to the draft report. Proposed additions are highlighted in turquoise

¹ IAFI is an affiliate member of APT.



Sub-Working Group on Spectrum Arrangement and Harmonization

**WORKING DOCUMENT TOWARDS NEW APT REPORT ON PMSE FREQUENCY
USAGE IN THE 470-806 MHZ BAND IN ASIA PACIFIC REGION**

1. Introduction:

In 2016, the Asia-Pacific Telecommunity (APT) adopted the APT Recommendation on ‘Frequency arrangements for the implementation of IMT in the band 698-806 MHz’ when considering the harmonized frequency arrangements in the band of 698 - 806 MHz for mobile services will facilitate global roaming, economies of scale and availability of low-cost user equipment and recognizing the needs of countries for low-cost mobile user equipment.

The AWG/REP-79 on ‘Frequency Arrangements for IMT in the Band 470-698 MHz’ is revising in AWG, which considering to expand the APT harmonized band plan for IMT in to 2 time 40 MHz to address the need of APT countries. This work item is planned to finalize in AWG-30.

Programme Making and Special Events (PMSE²) describes the service and applications that use radio spectrum to support the capture, production and broadcast of audio and video content consumed all over the world on a multitude of platforms. It relates typically to televised sport, outdoor music events, theatre productions, television light entertainment, feature film production and live television news gathering. However, it also encompasses many other applications, for example PMSE is used at exhibitions, conferences and educational institutions.

Many national administrations, including APT Members, decided and going to decide the 698-806 MHz band for International Mobile Telecommunication system (IMT) implementation. Some national administrations are also re-purposing the 610-698 MHz band from the traditional terrestrial TV, to accommodate IMT as well. At the present time, these bands are used by PMSE for content creation. However, there is a general incompatibility in co-channel spectrum sharing between various services, such as IMT and wireless PMSE equipment, specifically wireless microphones and similar devices, which are operating in the frequency range of 470-806 MHz. It is reported on some interference cases between IMT systems and PMSE equipment operating in the same frequency in some APT countries.

Re-purposing of these bands in favor of IMT systems is having a collateral effect of displacing some percentage of PMSE equipment. Also, there are transitions from analogue TV in the band 470-806 MHz to digital TV and mobile broadband, it is in the interests of national administrations and industry to examine, study, and specify frequency bands for PMSE in and

² Programme Making and Special Events (PMSE) equipment is meant for use in applications identified in various publications as Services Ancillary to Programme making (SAP), Services Ancillary to Broadcasting (SAB), Electronic News Gathering (ENG) / Outside Broadcasting (OB), Broadcast Auxiliary Systems (BAS) and applications used in meetings, conferences, cultural and education activities, trade fairs, local entertainment, sport, religious and other public or private events.

outside of TV bands, as well as the possibility of coexistence between PMSE and IMT in these bands.

The harmonization would provide economies of scale and logistical practicality, especially for networks and production companies that must cover events in multiple countries, such as global news, elections, international sport events, conferences, and concert tours.

However, the availability of spectrum for PMSE equipment is determined by national administrations, according to differing national PMSE requirements, authorisation mechanisms and divergent national frequency plans.

This fragmentation of spectrum access contrasts with the preference of PMSE stakeholders that operate internationally for equipment that may be operated across multiple countries, and of PMSE equipment manufacturers for economies of scale to encourage innovation and investment in new equipment.

Reconciling the requirements of PMSE users with the divergence in PMSE demand for spectrum and fragmentation of supply across administrations lies behind the recommended “tuning ranges” concept for PMSE. A “tuning range” is a range of frequencies over which radio equipment is envisaged to be capable of operating. Within this tuning range, the use in any single administration of radio equipment will be limited to the range of frequencies identified for PMSE nationally (if any) within that country and will be operated in accordance with the related national regulatory conditions and requirements.

Furthermore, it is reported on interference cases between IMT systems and PMSE equipment operating in the same frequency in some APT countries.

2. Terminologies and definitions

[TBD]

3. Current status of frequency usage for PMSE in APT countries

AWG-30 developed a survey questionnaire to collect information of regulation and frequency usage of PMSE equipment in the bands 470-806 MHz in Asia Pacific region. The questionnaire is made of five questions which can be found in APT/AWG website ([link](#)). This section summarizes the responses from the APT members to the questionnaire.

3.1 Summary of the respondents

During the AWG-31 meeting, eight administrations responded to the questionnaire. The detailed responses could be found in the following input contributions:

Country	Abbreviation	Document
Bhutan (Kingdom of)	BTN	AWG-31/INP-10
Nepal (Federal Democratic Republic of)	NPL	AWG-31/INP-15
Thailand (Kingdom of)	THA	AWG-31/INP-21
Japan	J	AWG-31/INP-40
Palau (Republic of)	PLW	AWG-31/INP-42
Malaysia	MLA	AWG-31/INP-46
Indonesia (Republic of)	INS	AWG-31/INP-57
Viet Nam (Socialist Republic of)	VTN	AWG-31/INP-81

3.2 Summary of Questionnaire Responses

3.2.1 Question 1

What are the existing services and systems in your country for frequency band 470 – 806 MHz and the incumbent applications?

Answers (detail informations could be found in the Annex to this Report)

Band	Services (Systems)			
	BS	MS/LMS	FS	RNS
470 – 610 MHz	BTN (DTTV, PMSE) NPL(DTTV) THA(DTTV) J(DTTV) MLA(DTTV) INS(DTTV) ³ VTN(DTTV)	J(PMSE) MLA (PMSE) VTN(PMSE)	J VTN	VTN
610 – 698 MHz	NPL(DTTV) THA(DTTV) J(DTTV) MLA(DTTV) INS(DTTV) ³ VTN(DTTV)	BTN (IMT) PLW J(PMSE) MLA(PMSE) VTN(PMSE) ⁴	J VTN(IMT)	
698 – 806 MHz	INS(ATV) J(DTTV) ⁶ VTN ⁵	BTN (IMT) NPL(IMT) ¹ J(DTTV) ⁷ THA(IMT) ¹ MLA(IMT) PLW ² VTN	VTN(IMT)	

Note:

- 1) 703-748 MHz paired with 758 MHz -803 MHz for International Mobile Telecommunications
- 2) 703-743 MHz paired with 758 MHz -798 MHz for International Mobile Telecommunications
- 3) 478-694 MHz for Digital TV Broadcasting, 694-806 MHz for Analog television; 470-478 MHz (channel 21 UHF) is not used for any Broadcasting activities as the frequency channel is intended as guard band between IMT 3GPP Band 31 and Digital TV Broadcasting; 478-694 MHz is heavily used for Digital TV Broadcasting using DVB-T2 with 8 MHz channeling
- 4) Can be used for DTTV until 2028
- 5) Not in operation anymore
- 6) 698-710 MHz for DTTV⁷ 710-714 MHz for PMSE; 714-750 MHz: for IMT; 750-770 MHz for ITS; 770-806 MHz for IMT

3.2.2 Question 2

What is the PMSE equipment operating in 470 – 806 MHz deployed in your country?

Answers

Country	Band	If yes, please specify the applications
Bhutan (Kingdom of)	470 – 610 MHz	None
	610 – 698 MHz	None
	698 – 806 MHz	None
Nepal (Federal Democratic Republic of)	470 – 610 MHz	NA
	610 – 698 MHz	NA
	698 – 806 MHz	NA
Thailand (Kingdom of)	470 – 610 MHz	-
	694 – 703 MHz	Wireless microphone
	748 – 758 MHz	
	803 – 806 MHz	
Japan	470 – 714 MHz	Radio Microphone (licensed) and Digital Radio Microphone (licensed)
Palau (Republic of)	None	None
Malaysia	470 – 694 MHz	Wireless Microphone Device (Class Assignment/Unlicensed)
Indonesia (Republic of)	470 – 806 MHz	No exclusive allocation for PMSE
Viet Nam (Socialist Republic of)	470 – 610 MHz	Wireless microphone (470 – 694 MHz)
	610 – 698 MHz	
	698 – 806 MHz	None

3.2.3 Question 3

Does your country regulate PMSE equipment operating in 470 – 806 MHz now?

Answers

Country	Band	If yes, please specify the regulations and standards
Bhutan (Kingdom of)	470 – 610 MHz	No
	610 – 698 MHz	No
	698 – 806 MHz	No
Nepal (Federal Democratic Republic of)	470 – 610 MHz	No
	610 – 698 MHz	No
	698 – 806 MHz	No
Thailand (Kingdom of)	470 – 610 MHz	-
	694 – 703 MHz	50mW maximum e.i.r.p for Wireless microphone
	748 – 758 MHz	
	803 – 806 MHz	

Japan	470 – 714MHz	For your information, the standard of Specified Radio Microphone is referred to in the page below. https://www.arib.or.jp/english/std_tr/telecommunications/std-t112.html
Palau (Republic of)	None	None
Malaysia	470 – 694 MHz	Class Assignment for Wireless Microphone Device <ul style="list-style-type: none"> EIRP: Shall not exceed 50mW Transmitter and receiver spurious emissions & Test reference: EN 300 220-1/ EN 300 422-1
Indonesia (Republic of)	470 – 806 MHz	No exclusive allocation for PMSE, low power PMSE equipment operated under class license
Viet Nam (Socialist Republic of)	470 – 610 MHz	30mW maximum ERP for Wireless microphone (470 – 694 MHz) <ul style="list-style-type: none"> - National technical regulation on cordless audio devices in the range 25 MHz to 2000 MHz (QCVN 91:2015/BTTTT); - National technical regulation on radio spectrum and radiation of Radio Telecommunications Equipment (QCVN 47:2015/BTTTT); - Circular providing the list of radio frequency use license-exempt radio devices and accompanying technical and operational conditions (Circular No. 08/2021/TT-BTTTT).
	610 – 698 MHz	
	698 – 806 MHz	

3.2.4 Question 4

Which portion of the 470 – 806 MHz band is not allowed for PMSE equipment?

Answers

Country	
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Bhutan (Kingdom of)	Those allocated for cellular communication
Nepal (Federal Democratic Republic of)	No PMSE equipment having range more than 15 meters is allowed to operate in the whole range of 470 – 806 MHz
Thailand (Kingdom of)	Frequency bands 470-694 MHz, 703-748 MHz and 758-803 MHz are not allowed.
Japan	714-750 MHz band can be used only for IMT and 750-770 MHz band can be used only for ITS, while 470-714 MHz band can be used for PMSE(Specified Radio Microphone and Digital Specified Radio Microphone)
Palau (Republic of)	No current band allocate to PMSE equipment
Malaysia	The 694 MHz to 806 MHz frequency range is not allowed for PMSE equipment.
Indonesia (Republic of)	In relation to the answer provided in question no 1, there is no allocation for PMSE equipment in the 470-806 MHz frequency range. However, exception is provided for the temporary use of the 470-806 MHz frequency for PMSE limited to special events. The use of PMSE in this band is only permitted for very specific, limited, and temporary usage (e.g. Asian Games 2018 special event) , and is subject to non-interference and no-protection. It is also regulated that the use of low power PMSE devices (e.g. wireless microphone) are to be operated under Class License.
Viet Nam (Socialist Republic of)	PMSE equipment is not allowed to operate in the frequency band 694 - 806 MHz. In Viet Nam, there are number of wireless microphones operating in 694-806 MHz range been imported and causing harmful interference to LTE-700 MHz networks. It's time and resource consuming to eliminate those wireless microphones.

3.2.5 Question 5

Do you think it is necessary to harmonize the frequency band / tuning range for PMSE equipment among APT countries?

Answers

Country	
Bhutan (Kingdom of)	Agree

Nepal (Federal Democratic Republic of)	Agree
Thailand (Kingdom of)	Neutral
Japan	Neutral
Palau (Republic of)	Do not agree
Malaysia	Neutral
Indonesia (Republic of)	Neutral To harmonize a dedicated frequency band for PMSE, it is important to avoid using existing broadcasting and IMT bands, therefore to seek frequency band other than the following frequency bands: 1) MF Broadcasting 526.5 – 1606.5 kHz 2) HFBC bands 3) VHF Band II (87 – 108 MHz) 4) VHF Band III (174 – 230 MHz) 5) UHF TV bands (478 – 694 MHz) 6) IMT Band 28 (703-748 MHz paired with 758-803 MHz)
Viet Nam (Socialist Republic of)	Taking into account the ongoing studies in the band 470-694/960 MHz in ITU-R for mobile service, there is a need to harmonize the frequency band / tuning range for PMSE equipment among APT countries for ensuring the stable operation and future development of PMSE equipment.

4. Possible harmonized frequency band / tuning range for PMSE in APT countries
[TBD]

5. Summary / Conclusion
[TBD]

ANNEX

Detail information on existing services and systems in your country for frequency band 470 – 806 MHz and the incumbent applications

Country	Band	Services	Systems
Bhutan (Kingdom of)	470 – 610 MHz	Broadcasting Service]	[DTTV, PMSE]
	610 – 698 MHz	[Mobile Service]	[IMT, IMT-Advanced,
	698 – 806 MHz	Mobile Service	IMT, IMT-Advanced
Nepal (Federal Democratic Republic of)	470 – 610 MHz	Broadcasting Service	Digital Terrestrial Television Broadcasting and television distribution networks
	610 – 698 MHz	Broadcasting Service	Digital Terrestrial Television Broadcasting and television distribution networks
	698 – 806 MHz	Mobile Service	703 MHz -748 MHz paired with 758 MHz -803 MHz for International Mobile Telecommunications
Thailand (Kingdom of)	470 – 610 MHz	Broadcasting Service	DTTV
	610 – 694 MHz	Broadcasting Service	DTTV
	703 – 748 MHz	Mobile Service	IMT (uplink)
	758 – 803 MHz	Mobile Service	IMT (downlink)
Japan	470-710 MHz	Fixed service Broadcasting service Land mobile service	DTTV PMSE
	710-714 MHz	Land mobile service	PMSE
	714-750 MHz	Mobile service	IMT
	750-770 MHz	Land mobile service	ITS
	770-806 MHz	Mobile service	IMT, etc.
Palau (Republic of)	355 – 427 MHz	[Digital Television Service]	[DTTV]
	703-723 MHz – Uplink 758-778 MHz – Downlink 723-743 MHz – Uplink 778-798 MHz - Downlink	Mobile Cellular Devices	Band (3GPP)

Malaysia	470 – 698 MHz	Broadcasting Service	DTTV (470 – 694 MHz)
		Fixed/Mobile Service	Wireless Microphone Device (470 – 694 MHz)
	698 – 806MHz	Mobile Service	IMT (703 – 803 MHz)
Indonesia (Republic of)	470 - 478 MHz	None	None
	478 – 694 MHz	Digital TV Broadcasting	DTTV DVB-T2
	694 – 806 MHz	Analog TV Broadcasting	PAL-G
	<ul style="list-style-type: none"> ▪ 470 – 478 MHz (channel 21 UHF) is not used for any Broadcasting activities as the frequency channel is intended as guard band between IMT 3GPP Band 31 and Digital TV Broadcasting ▪ 478 – 694 MHz is heavily used for Digital TV Broadcasting using DVB-T2 with 8 MHz channeling ▪ 694 – 806 MHz is currently being use for analog TV, future use is intended only for mobile service using IMT (UHF TV band is undergoing transition from analogue transmission to digital transmission) 		
Viet Nam (Socialist Republic of)	470 – 610 MHz	BROADCASTING SERVICE	DTTV
		Fixed Service Mobile Service Radionavigation Service	PMSE ¹
	610 – 698 MHz	BROADCASTING SERVICE	DTTV (until 2028)
		Fixed Service Mobile Service	IMT ² , PMSE
698 – 806 MHz	BROADCASTING SERVICE FIXED SERVICE MOBILE SERVICE	IMT ³	
<p>¹ The band 470-694 can be use for PMSE subject to the condition that no harmful interference is caused to, and no protection is claimed from other licensed equipment, in accordance with Circular No. 08/2021/TT-BTTTT.</p> <p>² The band 610 – 694 MHz is identified for IMT and can be used after 2028 when the DTV be switched off in this band, in accordance with National Frequency Allocation Table, footnote VTN27.</p> <p>³ The band 694-806 MHz is identified for IMT, in accordance with footnote VTN7 of the National Frequency Allocation Table.</p>			

	<p>The band plan for IMT in this band is specified in Circular No. 08/2021/TT-BTTTT, which is compatible with frequency arrangement A7 of Recommendation ITU-R M.1036-6 and 3GPP band n28.</p>
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