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**APT report on SURVEY the usage and future plan of**

**The Band 3300-3400 MHz IN ASIA PACIFIC REGION**

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***(Source: AWG-23/OUT-17)***

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**The Band 3300-3400 MHz IN ASIA PACIFIC REGION**

1. **Introduction**

During WRC-15 meeting, the band of 3 300-3 400 MHz was identified for the implementation of International Mobile Telecommunications (IMT) in 33 countries in Region 1, 6 countries in Region 2, 6 countries (including Cambodia, India, Lao P.D.R., Pakistan, the Philippines and Viet Nam) in Region 3.

To facilitate the study on the band 3 300-3 400 MHz for terrestrial IMT-Advanced/IMT-2020 systems for the Asia Pacific region, AWG-21 developed a questionnaire to collect information on the current usage and future plan of the band 3 300-3 400 MHz among the APT countries.

The questionnaire is made of ten questions which can be found in APT/AWG website ([link](http://www.apt.int/sites/default/files/2017/04/AWG-21-out-24_QUESTIONNAIRE_ON_Bands_3300-3400_MHz_0.docx)). The information on the current usage and future plan of the band 3 300-3 400 MHz in Asia Pacific region was encouraged to share in the questionnaire.

1. **Summary of the respondents**

During the AWG-22 and AWG-23 meetings, twelve administrations responded to the questionnaire. The detailed response could be found in the following input contributions:

|  |  |
| --- | --- |
| **Country** | **Document** |
| Thailand | AWG-22-INP-11 |
| Australia | AWG-22-INP-19 |
| Indonesia | AWG-22-INP-47 |
| Lao PDR | AWG-22-INP-53 |
| Iran | AWG-22-INP-57 |
| Singapore | AWG-22-INP-66 |
| Korea | AWG-22-INP-75 |
| China | AWG-22-INP-82, further updated in AWG-23-INP-92 |
| Viet Nam | AWG-22-INP-107 |
| Philippines | AWG-23-INP-58 |
| Bangladesh | AWG-23-INP-112 |
| Malaysia | AWG-23-INP-117 |

1. **Summary of Questionnaire Responses**

**3.1 Question 1**

What is/are current allocation(s) (e.g. mobile service, fixed service, mobile-satellite service) in the bands 3 300-3 400 MHz in your country?

**Answers**

|  |  |  |
| --- | --- | --- |
| **Countries** | **Frequency Portion** | **Services** |
| **Thailand** | 3300-3400 MHz | Radiolocation (Primary) |
| 3300-3400 MHz | Armature Radio (Secondary) |
| **Australia** | 3 300-3 400 MHz | Radiolocation (primary) |
| 3 300-3 400 MHz | Amateur, Fixed, Mobile (all secondary) |
| **Indonesia** | 3300 – 3400 MHz | Fixed |
| **Lao PDR** | 3300-3400 MHz | RADIOLOCATION  Amateur |
| **Iran** | 3300-3400 MHz | FIXED, MOBILE, RADIOLOCATION |
| **Singapore** | No allocations | No allocations |
| **Korea** | 3 300-3 400 MHz | Radiolocation service, Mobile service, Fixed service |
| **China** | 3 300 - 3 400 MHz | FIXED  MOBILE  RADIOLOCATION  Amateur |
| **Viet Nam** | 3 300-3 400 MHz | FIXED SERVICE |
| 3 300-3 400 MHz | MOBILE |
| 3 300-3 400 MHz | RADIOLOCATION |
| 3 300-3 400 MHz | Amateur |
| **Philippines** | 3300 – 3400 MHz | Broadband Wireless Services (BWA) |
| **Bangladesh** | 3300 – 3400 MHz | 1. RADIO LOCATION 2. FIXED 3. MOBILE 4. Amateur |
| Malaysia | 3300 – 3400 MHz | FIXED  MOBILE  RADIOLOCATION  Amateur |

**3.2 Question 2**

What application(s) is/are currently licensed/used in the 3 300-3 400 MHz band? Which frequency portion is used for each application?

**Answers**

|  |  |  |
| --- | --- | --- |
| **Countries** | **Frequency Portion** | **Applications** |
| **Thailand** |  | N/A |
| **Australia** | 3 300-3 400 MHz | Government use (primary) |
| 3 300-3 400 MHz | Amateur use (secondary) |
| **Indonesia** | 3300 – 3400 MHz | Broadband Wireless Access (BWA) |
| **Lao PDR** | None | |
| **Iran** | 3300-3400 MHz | Airborne radars |
| **Singapore** | No allocations | No allocations |
| **Korea** | 3 300-3 400 MHz | Radar |
| **China** | 3 300 - 3 400 MHz | RADIOLOCATION |
| **Viet Nam** | 3 300-3 400 MHz | Broadband Wireless Access |
| **Philippines** | 3300 – 3400 MHz | Broadband Wireless Services (BWA) |
| **Bangladesh** | 3300 – 3400 MHz | RADAR |
| **Malaysia** | 3300 – 3400 MHz | RADIOLOCATION  UWB Radar Imaging device  UWB Communication device |

**3.3 Question 3**

To what extent are those applications used (e.g. number of stations) in the bands 3 300-3 400 MHz in your country?

**Answers**

|  |  |  |
| --- | --- | --- |
| **Countries** | **Frequency Portion** | **Applications** |
| **Thailand** |  | N/A |
| **Australia** | 3 300-3 400 MHz | Government use – extensive itinerant use of high power radiolocation systems |
| 3 300-3 400 MHz | 16 amateur repeater stations |
| **Indonesia** | 3300 – 3400 MHz | 854 stations |
| **Lao PDR** | None | |
| **Iran** | 3300-3400 MHz | Airborne radars: In some air traffic control centers and airports |
| **Singapore** | No allocations | No allocations |
| **Korea** | 3 300-3 400 MHz | Radar |
| **China** | 3 300-3 400 MHz | Still under evaluation |
| **Viet Nam** | N/A | |
| **Philippines** | No assignee as of now |  |
| **Bangladesh** | 3 300-3 400 MHz | RADAR |
| **Malaysia** | 3300 – 3400 MHz | Radiolocation  UWB Communication device  Number of stations of the two applications not available |

**3.4 Question 4**

Is there any expiry date for the existing licenses in the bands 3 300-3 400 MHz in your country?

**Answers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Countries** | **Frequency Portion** | **Services/Applications** | **Licenses** |
| **Thailand** |  | N/A |  |
| **Australia** | 3 300-3 400 MHz | All above | Tenures/expiry dates vary, however all licences are issued with an expectation of renewal upon expiry |
| **Indonesia** | 3300 – 3400 MHz | Fixed Service / BWA | 5 years since assignment and can be extended for the next 5 years |
| **Lao PDR** | None | | |
| **Iran** | 3300-3400 MHz | Airborne radars | Expiry date is not an issue for this type of application |
| **Singapore** | No allocations | No allocations | No allocations |
| **Korea** | 3 300-3 400 MHz | Radar | no expiry date |
| **China** | 3 300-3 400 MHz |  | Not available. |
| **Viet Nam** | 3 300-3 400 MHz | Fixed | Until 2018 |
| **Philippines** | No assignee as of now |  |  |
| **Bangladesh** |  |  |  |
| **Malaysia** | 3300-3400 MHz | Radiolocation | Annually renewable upon expiry on 31 December |

**3.5 Question 5**

How widely are existing services/applications deployed in the bands 3 300-3 400 MHz within your country (in space and time – for example the geographical deployment in urban versus rural areas)?

**Answers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Countries** | **Frequency Portion** | **Services/Applications** | **Current Status** |
| **Australia** | 3 300-3 400 MHz | Government use | Australia-wide on itinerant basis |
| 3 300-3 400 MHz | Amateur | 16 repeater stations in five towns |
| **Indonesia** | 3300 – 3400 MHz | Fixed Service / BWA | urban : 547 stations  rural : 307 stations |
| **Lao PDR** | None | | |
| **Iran** | 3300-3400 MHz | Airborne radars | Airborne radars are deployed in some air traffic control centers and airports |
| **Singapore** | No allocations | No allocations | No allocations |
| **Korea** | 3 300-3 400 MHz | Radar | 24 hours and all territory |
| **China** | 3 300 - 3 400 MHz | RADIOLOCATION | Not specific |
| **Viet Nam** | 3 300-3 400 MHz | Fixed | Rural area |
| **Philippines** | No assignee as of now |  |  |
| **Bangladesh** | 3300-3400 MHz | RADAR | Urban Area- Limited Uses  Rural Area- Maximum Uses |
| **Malaysia** | 3300-3400 MHz | 1. Radiolocation 2. UWB Radar Imaging device 3. UWB Communication device (unlicensed) | 1. Nationwide 2. Limited for emergency and rescue agencies, law enforcement agencies, government agencies, scientific, research, commercial mining, medical and construction only 3. Limited to indoor use |

**3.6 Question 6**

When there are multiple applications licensed in the 3 300-3 400 MHz band, how do you achieve sharing/compatibility between these applications?

**Answers**

|  |  |
| --- | --- |
| **Countries** | **Answers** |
| **Thailand** | **-** |
| **Australia** | Amateur services are licensed on a secondary basis in Australia, so licences are issued with “no interference/no protection” conditions with respect to itinerant government radiolocation services. |
| **Indonesia** | No, we only have one application in the 3300 – 3400 MHz band, which is Broadband Wireless Access (BWA). |
| **Lao PDR** | None |
| **Iran** | Just one application (Airborne radars) are currently licensed in the 3 300-3 400 MHz band. |
| **Singapore** | There are currently no users and allocations in the 3300 – 3400MHz frequency band. |
| **Korea** | Yet to be determined. |
| **China** | Spectrum usage and requirements of different radiocommunication systems deployed within and adjacent to 3300 – 3400MHz frequency bands are taken into consideration to avoid harmful interference. |
| **Viet Nam** | - Service nature (Primary/Secondary)  **-** First come, first serve  - Frequency and distance separation principle |
| **Philippines** | N/A |
| **Bangladesh** | Not applicable |
| **Malaysia** | Technical analysis to study on sharing conditions is conducted prior to issuance of Apparatus Assignment. Apparatus Assignment is subject to operating conditions on sharing of the frequency, where required |

**3.7 Question 7**

Do you have planned or potential future applications on this bands 3 300-3 400 MHz?

**Answers**

|  |  |
| --- | --- |
| **Countries** | **Answers** |
| **Thailand** | No. |
| **Australia** | No [Australia is only monitoring developments, which does not suggest any plans at this stage.] |
| **Indonesia** | Yes. |
| **Lao PDR** | Yes. |
| **Iran** | Yes, future implementation of terrestrial IMT systems in the frequency range 3300-3400 MHz is under consideration |
| **Singapore** | Although Singapore was not included in the footnote identifying the 3300 – 3400MHz band for IMT services, it is noted that the industry had indicated a strong interest in this band. As such, Singapore will conduct studies to assess the feasibility of IMT deployment in this band and based on the results, Singapore may consider to be included into the footnote identifying this band for IMT. |
| **Korea** | No. |
| **China** | Yes. The band planning for 3 300 – 3 400 MHz as the band for IMT-2020 systems for indoor use in principle was officially issued in Nov, 2017. |
| **Viet Nam** | Yes, IMT. Guard band around 3 400 MHz need to be specified in order to avoid interference to the FSS systems in the band 3 400-3 600 MHz. |
| **Philippines** | BWA / 5G |
| **Bangladesh** | Not yet |
| **Malaysia** | No. |

**3.8 Question 8**

What is/are planned or potential future applications in the bands 3 300-3 400 MHz?

**Answers**

|  |  |  |  |
| --- | --- | --- | --- |
| **Countries** | **Frequency Portion** | **Future Applications** | **Timeline** |
| **Australia** |  | Not applicable. | Unknown |
| **Indonesia** | 3300 – 3400 MHz | IMT | Not sooner than 2020 |
| **Lao PDR** | 3300-3400 MHz | IMT | N/A |
| **Iran** | 3300-3400 MHz | IMT | Probably, in next two years |
| **Singapore** | To be studied | To be studied | To be studied |
| **China** | 3 300 - 3 400 MHz | IMT-2020 system | Commercialization 2019 - 2020 |
| **Viet Nam** | 3 300-3 400 MHz | IMT | Not decided yet |
| **Philippines** | 3300 – 3400 MHz | BWA / 5G  Memorandum Circular No. 02-02-2018 |  |
| **Bangladesh** |  |  |  |
| **Malaysia** | Not Applicable | Not Applicable | Not Applicable |

**3.9 Question 9**

What are the issues / challenges that need to be considered in order to allocate, identify and make available for use the bands of 3 300-3 400 MHz for IMT?

Answers

|  |  |  |
| --- | --- | --- |
| **Countries** | **Frequency Portion** | **Issues/Challenges** |
| **Thailand** | National Policy. | |
| **Australia** | 3 300-3 400 MHz | Ensuring ongoing use by itinerant government services. Australia finds it challenging to share spectrum between IMT and high power itinerant radiolocation services. |
| **Indonesia** | 3300 – 3400 MHz | Capital expenditures that have been invested by the existing BWA operators |
| **Lao PDR** |  | N/A |
| **Iran** | 3300-3400 MHz | Sharing between IMT systems and airborne radars systems |
| **Singapore** | 3300 – 3400MHz | Cross-border and adjacent band coexistence |
| **Korea** | 3 300-3 400 MHz | Sharing and compatibility with neighboring country |
| **China** | 3 300-3 400 MHz | Compatibility and sharing studies between IMT systems and other systems deployed within and adjacent to 3300 – 3400MHz frequency bands are needed before making decisions on frequency allocation or identification. |
| **Viet Nam** | 3 300-3 400 MHz | Guard band around 3 400 MHz need to be specified in order to avoid interference to the FSS systems in the band 3 400-3 600 MHz.  Economic scale of mobile device |
| **Philippines** | 3300 – 3400 MHz | None |
| **Bangladesh** | 3300-3400 MHz | Existing services need to be relocated in suitable alternative band. Co-existence with Protection. |
| **Malaysia** | 3300-3400 MHz | 1. Possible interference to/from Radiolocation stations in the frequency band 2. Coexistence of IMT stations with Radiolocation stations |

**3.10 Question 10**

Do you have any expectations or suggestions for your administration about the bands 3 300-3 400 MHz to be studied in the AWG?

**Answers**

|  |  |
| --- | --- |
| **Countries** | **Answers** |
| **Thailand** | **-** |
| **Australia** | Australia may contribute a proposal to study shared access between itinerant government and non-government mobile services – ensuring primacy for government services is maintained – at a future AWG. |
| **Indonesia** | No. |
| **Lao PDR** | None |
| **Iran** | Sharing studies between IMT systems and airborne radar systems within 3 300-3 400 MHz band, including effective interference mitigation techniques, is proposed to be conducted by AWG. |
| **Singapore** | No. |
| **Korea** | Before the development of the frequency arrangements for the bands 3 300–3 400 MHz, the relevant sharing and compatibility studies should be taken into account as outlined in Resolution 223 (Rev.WRC-15)]. |
| **China** | N/A |
| **Viet Nam** | APT members should:  - develop a report on usage and future plans of this band in Asia Pacific Region.  - promote study on harmonized frequency arrangement in the band 3 300-3 400 MHz, taken into account guard band with FSS around 3 400 MHz. |
| **Philippines** |  |
| **Bangladesh** | No |
| **Malaysia** | No |