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| APTlogogreen3 | ASIA-PACIFIC TELECOMMUNITY | **Document No.:** |
| **The 24th Meeting of the APT Wireless Group (AWG-24)**  | **AWG-24/INP-70** |
| 17 – 21 August 2018, Bangkok, Thailand | 10 August 2018 |

JAPAN

**RESPONSE TO QUESTIONNAIRE ON REGULATORY INFORMATION FOR IMPLEMENTATION IMT NETWORK IN ASIA-PACIFIC REGION**

**1. Background**

At the AWG-22 meeting held in September 2017, questionnaire on regulatory information for implementation IMT network was proposed and approved (AWG-22/OUT-06).

**2. Proposal**

Japan proposes that the following annex be considered as a response to the questionnaire on regulatory information for implementation IMT network

ANNEX

**questionnaire ON regulatory information for implementation IMT network in Asia-Pacific Region**

**Section 1: Elementary Part**

1. **Introduction:**

Protection of radio communication services is a key cornerstone for spectrum management with the appropriate definition of protection/sharing criteria. Nowadays, we are interested in a much more flexible world that is based on the premise of technology neutrality.

Service/Technology neutrality is understood as operators can deploy their network with any technology in any band, subject to it being economically efficient to do so, and no frequency band should be reserved for the exclusive use of a particular Service/Technology. Any two networks can be spectral/spatial neighbors. New technologies complies with the relevant spectrum technical requirements can be introduced as and when needed in a dynamic manner for effective spectrum trading.

Reviewing APT/AWG/REP-15 on Information of mobile operators’ frequencies, technologies and license durations in Asia Pacific countries, it is foreseen that IMT technologies (such as UMTS, HSPA, LTE, LTE-A and beyond) would be deployed in the same spectrum band in many markets.

The application of “neutrality” relies on the definition of a minimum set of parameters to which a certain radio system must adhere. Moreover, from a spectrum engineering point of view, the implementation of a radio system in a specific frequency band requires the consideration of many parameters (e.g., transmitter and receiver specific, or access methods TDD, FDD), which goes far beyond the general approach of having a simple analysis (e.g., just based on spectrum emission mask).

Compatibility studies carried out with specific technology / applications are enabling a fine tuning of parameters ensuring the best spectrum efficiency. The wider the assumptions are in relation to interfering and interfered systems (bandwidth, power, antenna category, TDD/FDD, deployment …), the more it is necessary to consider worst case scenarios. Different conditions associated with the assumption scenarios leads to different technical spectrum efficiency. Therefore, there is always a balance between the level of neutrality and the technical spectrum efficiency.

Normally, licensing of radio equipment is controlled by the authorization regimes of the regulators within Member States. National regulators are responsible for setting the conditions under which radio equipment can be authorized for use in their territories. These conditions might include, where appropriate in order to avoid harmful interference, frequency ranges, power limits, spectrum masks, etc. These conditions allow greater flexibility through minimal conditions attached to the authorization of the use of spectrum (i.e. a technology, service and application neutral approach).

To support and assist APT Members in using the radio frequency spectrum and deploying radio network effectively, it is proposed that the AWG consider to commence studies on establishing the minimum required set of technical conditions to be applied for coexistence that could help APT Administrations on regulating the neutrality usage of bands identified for IMT.

This survey is to collect regulatory information for implementation IMT network in the frequency bands used for IMT in Asia-Pacific Region countries. Based on the results of the survey, an APT survey report will be developed.

This Questionnaire is designed for administration as well as operators and other partners to provide the information. Response is requested only for those bands that are implemented whole or partly by IMT networks in your country.

**Section 2: Questionnaire Part**

**Question 1:**

**Institution/Company Information and Profile**

**Answer:**

Name of Administration : Ministry of Internal Affairs and Communications

Name of Contact Person : Masanori Miyake

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**Question 2:**

Which IMT technology being use and will be used or technology neutral in these bands?

Please fill in the frequency bands used for IMT and specify which IMT technology (e.g. WCDMA, HSPA, LTE, LTE-A, TDD-LTE, 3GPP Release 10, …) being used, if not IMT please answer “non-IMT”.

**Answer:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Frequency band****(MHz)** | **Frequency Block (MHz)** | **Operator** | **IMT Technology** | **Channel bandwidth (MHz)** |
| **Uplink** | **Downlink** |
| 718 – 748 /773 – 803 | 718 – 728 | 773 – 783 | KDDI | LTE |  |
| 728 – 738 | 783 – 793 | NTT DOCOMO | LTE |  |
| 738 – 748 | 793 – 803 | SoftBank | LTE |  |
| 815 – 845 / 860 – 890 | 815 – 830 | 860 – 875 | KDDI | CDMA2000 / LTE |  |
| 830 – 845 | 875 – 890 | NTT DOCOMO | WCDMA/ LTE |  |
| 900 – 915 / 945 – 960 | 900 – 915 | 945 – 960 | SoftBank | WCDMA/ LTE |  |
| 1427.9 – 1462.9 / 1475.9 – 1510.9 | 1427.9 – 1437.9 | 1475.9 – 1485.9 | SoftBank | LTE |  |
| 1437.9 – 1447.9 | 1485.9 – 1495.9 | KDDI | LTE |  |
| 1447.9 – 1462.9 | 1495.9 – 1510.9 | NTT DOCOMO | LTE |  |
| 1710 – 1785 /1805 – 1880 | 1710 - 1730 | 1805 - 1825 | KDDI | LTE |  |
| 1730 - 1750 | 1825 - 1845 | Rakuten | LTE |  |
| 1750 - 1765 | 1845 - 1860 | SoftBank | LTE |  |
| 1765 - 1785 | 1860 - 1880 | NTT DOCOMO | LTE |  |
| 1884.5 – 1915.7 | 1884.5 – 1915.7 (TDD) | SoftBank | PHS |  |
| 1920 – 1980 / 2110 - 2170 | 1920 - 1940 | 2110 - 2130 | KDDI | CDMA2000 / LTE |  |
| 1940 - 1960 | 2130 - 2150 | NTT DOCOMO | WCDMA/ LTE |  |
| 1960 - 1980 | 2150 - 2170 | SoftBank | WCDMA/ LTE |  |
| 2545 – 2575 | 2545 – 2575 (TDD) | Wireless City Planning Inc. | AXGP (Advanced eXtended Global Platform) |  |
| 2595 - 2645 | 2595 – 2645 (TDD) | UQ Communi-cations | WiMAX / WiMAX2+ |  |
| 3400 - 3600 | 3400 – 3440 (TDD) | SoftBank | LTE |  |
| 3440 – 3520 (TDD) | NTT DOCOMO | LTE |  |
| 3520 – 3560 (TDD) | KDDI | LTE |  |
| 3560 – 3600 (TDD) | SoftBank | LTE |  |

**Question 3:**

Please provide (or refer to) characteristics, and protection criteria, for implementing the IMT systems/networks in Question 2, and similar information for non-IMT services, within the IMT band and in the neighboring bands.

**Answer:**

In Japan, at first, we define parameters for sharing studies based on IMT technologies which are considered for introduction. Then, sharing studies between IMT and existing services in the same/adjacent frequency band are conducted, in the frequency bands which are scheduled to be used for IMT.

Subsequently, frequency assignment plans and technical regulations are established, and then operators submit the implementation plan according to guidelines developed by the supervisory authority. Based on the examination of licensing by the supervisory authority, each frequency band is assigned to respective operators. Therefore, characteristics and protection criteria varies in the introduction of IMT technologies and the existing services in the same/adjacent frequency band.

Further information about radio use and administration such as frequency assignments in Japan can be found at the following web location.

http://www.tele.soumu.go.jp/e/index.htm

**Question 4:**

Which case of coexistence as illustrated below and the technical conditions must be applied to each IMT block (e.g power limit, emission mask for spectrum block, pfd limit, …) to support technology neutrality and spectrum efficiency?

**Answer:**

|  |  |  |
| --- | --- | --- |
| Frequency band (MHz) | Case | Technical condition |
| All bands | A | Application of unwanted emission regulations based on IMT standards should be considered. Also, guard bands are inserted as necessary. |
| B | Policies vary in non-IMT technologies to be protected. Generally, considering unwanted emission characteristics based on IMT standards, we should take the operating and adjusting approach such as inserting necessary guard bands, taking separate distance, and limiting the number of establishments of radio stations.  |
| C | Policies vary in non-IMT technologies to be protected. Generally, considering unwanted emission characteristics based on IMT standards, we should take the operating and adjusting approach such as inserting necessary guard bands, taking separate distance, and limiting the number of establishments of radio stations.  |
| D(as shown in the following figure) | Policies vary in IMT technologies. We should take the operating and adjusting approach as necessary, such as taking separate distance and limiting the number of establishments of radio stations.  |
| E(as shown in the following figure) | Policies vary in non-IMT technologies to be protected. We should take the operating and adjusting approach such as taking separate distances and limiting the number of establishments of radio stations. |



Case A: coexistence between IMT block and IMT in adjacent block in same IMT band

Case B: coexistence between IMT block and non-IMT in adjacent block in same IMT band

Case C: coexistence between IMT block in IMT band and non-IMT block in adjacent band

Case E: coexistence between IMT block and non-IMT block co-channel but adjacent geographical area

Case D: coexistence between IMT block and other IMT block co-channel but adjacent geographical area

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