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Thailand

PROPOSAL FOR PRELIMINARY APT COMMON PROPOSALS ON WRC-19 AGENDA ITEMS 1.13, 1.16 AND 9.1 (ISSUES 9.1.1, 9.1.5 AND 9.1.8)

Agenda Item 1.13:

"to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution 238 (WRC-15)"

1. Background

International Mobile Telecommunications (IMT) systems have contributed to global economic and social development of both developed and developing countries. IMT systems are now being evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband (eMBB), massive machine-type (mMTC) and ultra-reliable and low-latency communications (URLLC) requiring larger contiguous blocks of spectrum than currently available bandwidth to realize those applications, as described in Recommendation ITU-R M.2083.

Resolution 238 (WRC-15) specifies the following frequency bands for the appropriate sharing and compatibility studies with respect to services in adjacent bands:

- 24.25-27.5 GHz, 37-40.5 GHz, 42.5-43.5 GHz, 45.5-47 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz, which have allocations to the mobile service on a primary basis; and
- 31.8-33.4 GHz, 40.5-42.5 GHz and 47-47.2 GHz, which may require additional allocations to the mobile service on a primary basis.

The CPM Report for agenda item 1.13 includes:

– The results of the studies of estimated spectrum needs for the terrestrial component of IMT in the frequency range between 24.25 GHz and 86 GHz;

– The results of sharing and compatibility studies carried out by ITU-R for each of the frequency bands under study; and

– The methods to satisfy agenda item 1.13 and regulatory and procedural considerations for each of the frequency bands under study.

A no-change method (NOC) to the Radio Regulations (RR) is included in each of the frequency bands. Some other methods are accompanied by a series of alternatives for allocation and/or identification for IMT as appropriate. Furthermore, conditions for protection measures of different services are also included, as appropriate.

Contact: Office of the NBTC, Thailand Email:

It is noted that some of the frequency bands under this agenda item overlapped with those frequency bands subjected to studies under WRC-19 agenda items 1.6, 1.14 and 9.1 (issue 9.1.9).

2. Views and Proposals

Taking into account current ITU-R sharing and compatibility studies and methods to satisfy the agenda item as reflected in the CPM Report, Thailand's views and proposals are as follows:

Band A: 24.25-27.5 GHz
Thailand supports identification of the frequency band 24.25-27.5 GHz, which will provide administrations the flexibility to implement IMT in the entire band or portions thereof, through Method A2 Alternative 2 in the CPM Report.
[Protection of the incumbent services in this and adjacent frequency bands should be ensured by selecting an appropriate Option for each Condition under Method A2 in the CPM Report.]
[Protection of the incumbent services in these frequency bands should be established appropriately based in the results of sharing and compatibility studies.]

Band B: 31.8-33.4 GHz
Thailand supports Method B1 which proposes NOC to the Radio Regulations as the only Method in the CPM Report, for the frequency band 31.8-33.4 GHz due to difficulty of sharing and compatibility between IMT and the incumbent services.

Bands C/D/E: 37-40.5 GHz, 40.5-42.5 GHz and 42.5-43.5 GHz
Thailand supports identification of the frequency bands 37-40.5 GHz, 40.5-42.5 GHz and 42.5-43.5 GHz, or portions thereof, for IMT, through Methods C2/D2/E2 Alternative 2 in the CPM Report.
[Protection of the incumbent services in these and adjacent frequency bands should be ensured by selecting an appropriate Option for each Condition under Method C2/D2/E2 in the CPM Report.]
[Protection of the incumbent services in these frequency bands should be established appropriately based in the results of sharing and compatibility studies.]

Thailand also supports APT Views reached at APG19-4 recognizing that different administrations would implement IMT in different portions of the 37-43.5 GHz frequency range for IMT, and a global identification for IMT in the 37-43.5 GHz band, or portions thereof, would allow each country/region to implement IMT in different portions of the band in accordance with their national/regional considerations, while still facilitating the benefits of economies of scale.

Bands F/G/H/I: 45.5-47 GHz, 47-47.2 GHz, 47.2-50.2 GHz and 50.4-52.6 GHz
Thailand supports Methods F1/G1/H1/I1 which propose NOC to the Radio Regulations for the frequency bands 45.5-47 GHz, 47-47.2 GHz, 47.2-50.2 GHz and 50.4-52.6 GHz partly due to insufficient sharing and compatibility studies in some of the frequency bands as mentioned in the CPM Report and also due to divergent views and lack of strong interest from industry.

Nevertheless, Thailand is not against continuation of further studies for possible identification of these frequency bands for IMT in the future if there is still such a strong interest to do so.

Band J: 66-71 GHz

Thailand supports Method J3 which proposes continuation of studies in this frequency band for possible IMT identification through a WRC Resolution. While there is a strong interest from the industry for this frequency band but divergent views still exist, and further studies may warrant such an action.

A revision to Resolution **238 (WRC-15)** or a new WRC resolution may be required.

Bands K/L: 71-76 GHz and 81-86 GHz

Thailand supports Methods K1/L1 which propose NOC to the Radio Regulations for the frequency bands 71-76 GHz and 81-86 GHz due to divergent views and lack of strong interest from industry.

Agenda Item 1.16:
"to consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, in accordance with Resolution 239 (WRC-15)."

1. Background

Resolution 239 (WRC 15), calls for ITU-R to study WAS/RLAN technical characteristics and operational requirements in the 5 GHz frequency range. It also calls for ITU-R to perform sharing and compatibility studies between WAS/RLAN applications and incumbent services in the frequency bands 5 150-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz while ensuring the protection of incumbent services including their current and planned use, to consider enabling outdoor WAS/RLAN operations in the band 5 150-5 350 MHz, and potential mobile service allocations to accommodate WAS/RLAN operations in the 5 350-5 470 MHz and 5 725-5 850 MHz frequency ranges, and identify potential WAS/RLAN use in 5 850-5 925 MHz frequency range.

For the 5 150-5 250 MHz frequency band, six methods (including NOC) are proposed (A1, A2, A3, A4, A5 and A6); for the 5 250-5 350 MHz and for the 5 350-5 470 MHz frequency bands, only one method (NOC) is proposed (B and C respectively); for the 5 725-5 850 MHz frequency band, three methods (including NOC) are proposed (D1, D2 and D3); and for the 5 850-5 925 MHz frequency band only one method (NOC) is proposed (E).

2. Views and Proposals

In the frequency bands 5 250-5 350 MHz, 5 350-5 470 MHz and 5 850-5 925 MHz, Thailand supports No Changes to the Radio Regulations for the use of WAS/RLAN to protect the incumbent services.

In the frequency band 5150 – 5250 MHz, Thailand supports possible outdoor WAS/RLAN operations while having conditions to protect the incumbent services, without unacceptable constraints on these services. In this regard, Thailand prefers Method A3.

In the frequency band 5 725-5 850 MHz, some Administrations including Thailand already have a mobile primary allocation in accordance with RR No.5.453. Therefore, Thailand invites other Administrations to consider allocation to the mobile service in the band without technical constraints.

Agenda Item 9.1 Issue 9.1.1:
"Resolution 212 (Rev. WRC-15) - Implementation of International Mobile Telecommunications (IMT) in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz"

1. Background

The frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz have been identified in the Radio Regulations (RR) for use by IMT. Within these broader frequency ranges, the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz are allocated to the FS, MS and MSS on a co-primary basis. The MSS allocation is in the Earth-to-space direction in the 1 980-2 010 MHz frequency band, and in the space-to-Earth direction in the 2 170-2 200 MHz frequency band. Both the satellite and terrestrial components of IMT have been deployed or are being considered for further deployment within the 1 980-2 010 MHz and 2 170-2 200 MHz frequency bands.

Resolution **212 (Rev.WRC-15)** invites *"ITU-R to study possible technical and operational measures to ensure coexistence and compatibility between the terrestrial component of IMT (in the mobile service) and the satellite component of IMT (in the mobile service and the mobile-satellite service) in the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz where those frequency bands are shared by the mobile service and the mobile-satellite service in different countries, in particular for the deployment of independent satellite and terrestrial components of IMT and to facilitate development of both the satellite and terrestrial components of IMT"*.
In accordance with Resolution **212 (Rev.WRC-15)**, coexistence and compatibility between the terrestrial component of IMT (in the MS) and the satellite component of IMT (in the MS and the MSS) in neighboring countries/different concerned countries/adjacent geographical areas across different countries were studied to facilitate the development of both the satellite and terrestrial components of IMT.

For the satellite component of IMT, the technical and operational characteristics used in the studies were based on the specifications from Recommendation ITU-R M.1850-2. It should be noted that some parameters used in the studies (e.g. bandwidth and satellite e.i.r.p.) differ from those currently in Recommendation ITU-R M.1850-2, as a consequence of technical development of the satellite component of IMT. The use of these parameters is still being studied in ITU-R. However, those differences do not affect the conclusions of the calculations in Scenarios A1 and A2.

The parameters for the terrestrial component of IMT used in the studies are based on Report ITU-R M.2292, and the methodology for modelling and simulating the terrestrial IMT network is given in Recommendation ITU-R M.2101. It should be noted that in addition to the values specified in Report ITU-R M.2292, one study employed different values for some of the parameters (noise figure, antenna gain and body loss), as a consequence of technical development of the terrestrial component of IMT, such as Machine Type Communication (MTC) as contained in Recommendation ITU-R M.2012. The use of these assumed IMT MTC UE parameters, which are still being studied in ITU-R, resulted in different conclusions from those results for IMT UEs related to the scenario of potential interference from IMT space stations into terrestrial receivers.

The protection criterion for IMT-Advanced is provided in Report ITU-R M.2292-0 as $I/N = -6$ dB. Additional studies were performed by ITU-R with the protection criterion of $I/N = -10$ dB in order to assess the impact of lower I/N values on the compatibility between the satellite and terrestrial components of IMT operating in neighbouring countries.

The recommended frequency arrangements for terrestrial IMT are contained in Recommendation ITU-R M.1036-5.

2. Views and Proposals

Thailand is of the view that protecting terrestrial components of IMT in the frequency band 1 980 - 2 010 MHz and 2 170 - 2 200 MHz is preferred

However, since there are two different views in the CPM report and there are no conclusions drawn during the study cycle to justify values/parameters in the proposed regulatory constraints, Thailand supports no modification of the Radio Regulations (RR) regarding this agenda item.

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Agenda Item 9.1 Issue 9.1.5:
"Consideration of the technical and regulatory impacts of referencing Recommendations ITU-R M.1638-1 and ITU-R M.1849-1 in Nos. 5.447F and 5.450A of the Radio Regulations"

1. Background

The aim of this agenda item is to consider the technical and regulatory impacts of referencing Recommendations ITU-R M.1638-1 and ITU-R M.1849-1 in Nos. 5.447F and 5.450A of the Radio Regulations

Two Approaches have been developed to satisfy this agenda item.

2. Views and Proposals

Thailand supports Approach B in the CPM Report to satisfy this agenda item.

Agenda Item 9.1 Issue 9.1.8:

Studies on the technical and operational aspects of radio networks and systems, as well as spectrum needed, including possible harmonized use of spectrum to support the implementation of narrowband and broadband machine-type communication infrastructures, in order to develop Recommendations, Reports and/or Handbooks, as appropriate, and to take appropriate actions within the ITU Radiocommunication Sector (ITU-R) scope of work.

1. Background

Machine Type Communications (MTC), which are also known as Machine-to-Machine (M2M) communications or Internet of Things (IoT), describe communication between devices that do not require human intervention. An increasingly large number of MTC devices, with a range of performance and operational requirements, are expected to communicate due to further improvements of low-cost and low complexity device types requiring high reliability techniques, for instance in the field of traffic safety, traffic efficiency, smart grid, e-health, wireless industry automation, augmented reality, remote tactile control and tele-protection.

The results of ITU-R studies of the current and future spectrum use for narrowband and broadband MTC performed, as expressed in Resolution **958 (WRC-15)**, concluded that there is no need for any regulatory action in the Radio Regulations with regard to specific spectrum intended for use by those applications. Nonetheless, there are other mechanisms, which could facilitate the harmonized use of spectrum to support the implementation of narrowband and broadband MTC infrastructures, including ITU-R Recommendations or Reports.

2. Views and Proposals

Thailand supports the APG 19-4 Preliminary views on WRC-19 AGENDA ITEM 9.1 (ISSUE 9.1.8)”