



Thailand

**PROPOSAL FOR PRELIMINARY APT COMMON PROPOSALS ON WRC-19
AGENDA ITEMS 1.4, 1.5, 1.6, 7, 9.1.2, 9.1.3 AND 9.1.9****Agenda Item 1.4:**

to consider the results of studies in accordance with Resolution 557 (WRC-15), and review, and revise if necessary, the limitations mentioned in Annex 7 to Appendix 30 (Rev.WRC-15), while ensuring the protection of, and without imposing additional constraints on, assignments in the Plan and the List and the future development of the broadcasting-satellite service within the Plan, and existing and planned fixed-satellite service networks;

Resolution 557 (WRC-15) – Consideration of possible revision of Annex 7 to Appendix 30 of the Radio Regulations.

1. Background

WRC-15 adopted Resolution 557 (WRC-15) to study possible revisions of the limitations mentioned in Annex 7 to Appendix 30 (Rev.WRC-15) of the Radio Regulations (RR).

It should be noted that the broadcasting-satellite service (BSS) not subject to RR Appendix 30 (12.5-12.7 GHz, in Region 3) is not the subject of consideration in accordance with Resolution 557 (WRC-15).

It should be emphasized that studies calling for revision of Annex 7 to RR Appendix 30 (Rev.WRC-15) under Resolution 557 (WRC-15) in no way was intended to have any impact whatsoever to the integrity of RR Appendix 30 for Regions 1 and 3.

The Annex 7 to RR Appendix 30 (Rev.WRC-15) contains several orbital position limitations for proposed modifications to the Region 2 Plan and for proposed new or modified assignments in the Regions 1 and 3 List applicable to specific parts of the frequency band 11.7-12.7 GHz.

There are no orbital position limitations in RR Appendix 30A. One can already apply for and use the entire feeder-link frequency band within the restricted portions of the Annex 7 to RR Appendix 30 (Rev.WRC-15) arc. As a result, it is not necessary to analyse the impact of removing limitations that do not exist.

Should WRC-19 decide to remove some or all the current limitations on the use of the orbital arc for Regions 1 and 3 BSS networks as contained in Annex 7 to RR Appendix 30 (Rev.WRC-15), priority on the use of these new orbital positions should be given to those countries in Regions 1 and 3 with Plan assignments with equivalent downlink protection margin values in the RR Appendix 30 equal or below -10 dB, and with neither frequency assignments included in the List nor for which complete RR Appendix 4 information has been received by the Bureau in accordance with the provisions of § 4.1.3 of RR Appendix 30

(Rev.WRC-15). See draft new Resolution [B14-PRIORITY] (WRC-19) and draft new Resolution [D14-ENTRY-INTO-FORCE] (WRC-19).

2. Views and Proposals

Thailand is of the view that Deletion of some limitations of Annex 7 to Radio Regulations Appendix 30 (Rev.WRC-15), addition of draft new Resolutions [A14-LIMITA3] (WRC-19), [B14-PRIORITY] (WRC-19), [D14-ENTRY-INTO-FORCE] (WRC-19) and application of draft new Resolution [C14-LIMITA1A2] (WRC-19) with revised criteria for protection of new BSS networks with respect to limitations “A1a” and “A2a” should not impose on current and future FSS/BSS usage in the 11.7 – 12.7 GHz frequency band for Region 3.

Therefore, Thailand supports Method B of the CPM report.

Agenda Item 1.5:

to consider the use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion communicating with geostationary space stations in the fixed-satellite service and take appropriate action, in accordance with Resolution 158 (WRC-15);

Resolution 158 (WRC-15) – Use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion communicating with geostationary space stations in the fixed-satellite service.

1. Background

ESIM are earth stations that communicate with GSO FSS space stations but operate on platforms in motion in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz. There are three types of ESIM:

- ESIM on aircraft (aeronautical ESIM);
- ESIM on ships (maritime ESIM), and
- ESIM on land vehicles (land ESIM).

Any of the three types of ESIM can be used to provide broadband communications, including Internet connectivity.

Moreover, under Method B, for the operation of ESIM, examples of the technical, operational and regulatory responsibilities of administrations and entities responsible for the operation, authorization and the interference management of the various types of ESIM (on board aircraft, on board vessels and on board land vehicles) are defined and contained in the draft new Resolution [A15] (WRC-19).

2. Views and Proposals

Thailand supports Method B on modification of the Radio Regulations to Add a new footnote in RR Article 5 that refers to a new WRC Resolution [A15] (WRC-19) with technical, operational and regulatory conditions for the operation of ESIM while ensuring protection of allocated services and consequential suppression of Resolution 158 (WRC-15).

Agenda Item 1.6:

to consider the development of a regulatory framework for non-GSO FSS satellite systems that may operate in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space to Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space), in accordance with Resolution 159 (WRC-15);

Resolution 159 (WRC 15) – Studies of technical, operational issues and regulatory provisions for non-geostationary fixed-satellite services satellite systems in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2 50.2 GHz (Earth-to-space) and 50.4 51.4 GHz (Earth-to-space).

1. Background

Advances in satellite design, manufacturing and launch service capabilities have enabled the deployment of non-GSO FSS constellations. Additionally, the advances in antenna and terminal technology have enabled the development of the 50/40 GHz frequency bands for both GSO FSS/BSS and non-GSO FSS.

There are currently no regulatory provisions for sharing between non-GSO systems and GSO networks in the 50/40 GHz frequency bands. Moreover, there are no existing mechanisms in the RR establishing coordination procedures applicable to non-GSO systems operating within the FSS allocations in frequency bands in the 37.5 to 51.4 GHz range, such as the application of RR No. **9.12**. This also contributes to uncertainty among potential operators of non-GSO satellite systems in these bands.

To address these issues, WRC-15 established agenda item 1.6 for WRC-19: *“to consider the development of a regulatory framework for non-GSO FSS satellite systems that may operate in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) in accordance with Resolution 159 (WRC-15)”*.

2. Views and Proposals

Thailand is of the view that GSO satellite networks in FSS, MSS and BSS, and other existing primary services in the frequency bands 37.5- 39.5 GHz (space-to-Earth), 39.5 - 42.5 GHz (space-to-Earth), 47.2 - 50.2 GHz (Earth-to-space) and 50.4 - 51.4 GHz (Earth-to-space) should be protected from non-GSO FSS satellite systems in the same bands under the development as well as protection of the EESS (passive) in the frequency bands 36-37 GHz and 50.2-50.4 GHz and the radio astronomy in the frequency bands 42.5-43.5 GHz, 48.94-49.04 GHz and 51.4-54.25 GHz.

Agenda Item 7:

“to consider possible changes, and other options, in response to Resolution 86(Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution 86 (Rev.WRC-07) to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

Resolution 86 (Rev.WRC-07)–Implementation of Resolution 86 (Rev. Marrakesh, 2002) of the

Background

According to the Resolution 86 (Rev. WRC-07) Implementation of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, WRC-19 is invited to consider the matters which deal with regulatory deficiencies and improvements in current procedures/related appendices of the Radio Regulations for frequency assignments pertaining to the space services in order to reflect the latest technologies, as far as possible.

In response to the resolution, the scope of this Agenda Item 7 is determined to study possible changes and other options in the advance publication, coordination, notification and recording procedures of the Radio Regulations for frequency assignments to the satellite systems. Any proposals under this Agenda Item which have been identified by the Administrations and the concerned organization are requested to consider and discuss for finding the final appropriation. WRC-19 should ensure that the revised of procedure and the related appendices of the Radio Regulations will reflect the latest technologies.

Issue A: Bringing into use of frequency assignments to all non-GSO systems, and consideration of a milestone-based approach for the deployment of non-GSO systems in specific frequency bands and services

1. Background

WRC-12 and WRC-15 adopted into the RR a series of specific provisions, including RR No. **11.44B**, that clarified the requirements for the bringing into use (BIU) and the bringing back into use (BBIU) of frequency assignments to a space station in a GSO satellite network. However, there are no provisions in the RR that specifically address the BIU of frequency assignments to space stations in non-GSO systems. In this context and in order to complete the recording of frequency assignments to non-GSO systems, it has been the practice of the Bureau to declare their BIU successfully completed when one satellite is deployed into a notified orbital plane and capable of transmitting and/or receiving those frequency assignments. This practice, reflected for FSS and MSS non-GSO systems in section 2 of the Rules of Procedure for RR No. **11.44**, has been used for a number of years. Furthermore, it has been used irrespective of the number of satellites or of the number of orbital planes indicated in the notification information provided under RR No. **11.2**.

However, in its report to WRC-15 on the experience in the application of regulatory procedures and other related matters, the Director of the Radiocommunication Bureau stated that:

“Taking into account of the numerous non-GSO systems received so far by the Bureau, and the possible speculative nature of such submissions that could lead to spectrum warehousing and resurgence of so-called “paper satellite networks” the conference may wish to consider redefining the notion of bringing into use for non-GSO satellite networks.”

WRC-15 invited the ITU-R to examine, under the standing WRC agenda item 7, the possible development of regulatory provisions beyond those under RR Nos. **11.25** and **11.44** on the non-GSO FSS/MSS systems and the implications of the application of such milestones to non-GSO FSS/MSS systems brought into use after WRC-15.

2. Views and Proposals

Thailand support a clarified requirement for the bringing into use (BIU) of frequency assignments to all non-GSO systems and has a view that a continuous period of at least 90 days in a notified orbital plane of a satellite with the capability of transmitting or receiving the frequency assignments, as aligning with the current requirement for bringing into use to GSO systems, is required.

Thailand also accepts the development of an appropriate milestone based deployment approach for specific services and bands including any transitional measure to maintain the recording in the MIFR of assignments to non-GSO systems associated with a minimum number of satellites to be deployed over time.

Issue B: Application of coordination arc in the Ka-band, to determine coordination requirements between the FSS and other satellite services

1. Background

Evolution of technology and in particular the development of precise tracking systems, has allowed that terminals on board of systems in motion used in the MSS have characteristics comparable to fixed earth stations. As a result of this, WRC-15 approved the use of earth stations in motion under the FSS (Resolution **156 (WRC-15)**) in the same frequency bands considered under WRC-19 agenda item 7, Issue B.

Currently in the Radio Regulations, to determine whether coordination under RR No. 9.7 is required, in the frequency bands 29.5-30 GHz (Earth-to-space)/19.7-20.2 GHz (space-to-Earth) in all 3 Regions the following criteria is applied:

- FSS vs FSS: Coordination arc of 8°
- FSS vs MSS: $\Delta T/T > 6\%$
- MSS vs MSS: $\Delta T/T > 6\%$

In addition, in the FSS vs FSS coordination, administrations can always request application of RR No. 9.41 to include additional satellite networks that would be affected taking into account the $\Delta T/T > 6\%$ criteria.

Taking into account that the coordination arc criteria is used to determine coordination between FSS systems and it works in an effective and efficient way, WRC-19 agenda item 7, Issue B studies the possibility to apply this same coordination criteria to determine if coordination is required between MSS systems and between MSS and FSS systems.

2. Views and Proposals

To facilitate and make more efficient the coordination procedure, Thailand supports with the application of the coordination arc with a value of 8 degrees as the coordination criteria, to determine the requesting coordination between FSS and MSS systems and between MSS systems in the frequency bands 29.5-30 GHz (Earth-to-space) and 19.7-20.2 GHz (space-to-Earth) in all 3 Regions, replacing the existing coordination criteria $\Delta T/T > 6\%$.

Therefore, Thailand supports the single Method of the CPM report for this Issue.

Issue C: Issues for which consensus was achieved in ITU-R and a single method has been identified

1. Background

Issue C is a collection of several different topics that are viewed as being straightforward and for which consensus was readily achieved within ITU-R and a single method has been identified. The issues address such things as resolving inconsistencies in regulatory provisions, clarifying certain existing practices, or increasing transparency in the regulatory process. The issues are separately numbered into seven sub-issues.

- C1: to address the regulatory inconsistency identified in this issue is to align the text of paragraph 8.13 of Article 8 of RR Appendix 30B with that of RR No. 11.43A of RR Article 11.
- C2: to add another footnote to paragraph 6.1 of Article 6 of RR Appendix 30B to allow administration as the follows:
- a) to submit under paragraph 6.1 an additional use for the two blocks/sub-bands in 10-11 GHz but only bring into use one of the blocks/one sub-band or,
 - b) to submit under paragraph 6.1 an application of an additional use for only one of the two blocks/ sub-bands in 10-11 GHz and notify and bring into use that block/sub-band only;
 - c) to allow/authorize the Bureau, in applying Article 6, to act according to the nature of submission and further process them accordingly, i.e. to process the two blocks/sub bands or process one of the two block/sub-bands and further process the submission as received;
 - d) to allow/authorize the Bureau, in applying Article 8, to maintain one of the two blocks/sub-bands as notified even though the entire two blocks/sub-bands were submitted under Article 6 and successfully coordinated under that Article but only one of the block/sub-bands is notified or brought into use. (4A/425)
- C3: to add a new provision in Article 6 of RR Appendix 30B to clearly state that § 6.13 to 6.15 of RR Appendix 30B do not apply in the context of requirements associated with §6.6 of RR Appendix 30B.
- C4: to solidify the information required for submission for entry into the List under § 4.1.12 and for Notification under §§ 5.1.1 and 5.1.2 of RR Appendices 30 and 30A which seem to be identical.
- C5: to be considered advantageous to Notifying Administrations if the Bureau sends a reminder of the option to resubmit returned frequency assignments under RR No. 11.37 or 11.38. Modification of RR No. 11.46 requiring the Bureau to remind the Notifying Administration of the 6 month deadline would aid Administrations who may have had difficulties in receiving the communication of returned frequency assignments.
- C6: to modify § 6.17 to allow one submission to be treated in respect of both provisions and modify RR Appendix 4 to enable this.
- C7: to add a new provision 6.15*bis* to Article 6 of RR Appendix 30B in order to recognize the possibility of obtaining agreement from affected administrations for a specified period.

2. Views and Proposals

Thailand support the consideration of possible changes of Radio Regulations to resolve inconsistencies in regulatory provision, clarifying certain existing practices, or increasing transparency in the regulatory process.

Therefore, Thailand supports the single method in each of these sub issues within Issue C.

Issue D: Identification of those specific satellite networks and systems with which coordination needs to be effected under RR Nos. 9.12, 9.12A and 9.13

1. Background

Under the current regulatory, when an administration sends a coordination request for frequency assignments subject to RR Nos. **9.12, 9.12A and 9.13**, the Bureau publishes in the CR/C Special Section only a list of (potentially) affected administrations in the cases covered by the provisions under RR No. **9.36.1**.

It is required that the Bureau would additionally publish a list of potentially affected satellite networks and/or systems following the receipt of a coordination request (a new one or a modification to an existing one, as appropriate) for frequency assignments subject to RR Nos. **9.12, 9.12A and 9.13**, rather than a list of affected administrations only in order to help and reduce the administrative workload of identifying the names of specific satellite networks, systems and earth stations with which a new satellite network or system needs to effect coordination.

According to the CPM report, there are 2 Methods to satisfy this issue.

2. Views and Proposals

Thailand supports the amendment to the Radio Regulations by adding the requirements to have the list of potentially affected satellite networks and/or systems included in CR/C and CR/D special sections for coordination under RR Nos. 9.12, 9.12A and 9.13 which reduces the administrative workload of identifying the names of satellite networks and systems to be considered when effecting coordination.

Therefore, Thailand supports Method D1 of the CPM report.

Issue E: Resolution related to RR Appendix 30B

1. Background

An administration which decides to convert its national allotment into assignments in an economically viable manner very often needs to modify the initial characteristics of its national allotments, taking into account the latest available development and advancement in technology as well as the most economically viable solution.

In so doing, a) when the request for conversion is submitted, the application would be queued at the end of the last submission received before it and b) once its turn to be processed is reached, due to the nature of those additional systems/uses it would be extremely difficult, if

not totally impossible, to succeed coordination within the regulatory deadline. In summary, as it could be noted from the above, the probability that an administration could successfully complete coordination for the conversion of its national allotment to assignments with characteristics beyond the initial allotment within that regulatory period is very low.

2. Views and Proposals

Thailand is of the view that the establishment of special measures to be applied once with respect to the submission received from an administration having no frequency assignments in the RR Appendix **30B** List the details of which are to be contained in a WRC Resolution to facilitate the tasks of those administrations to provide an economically viable satellite service to its national territory as initially considered when the allotment Plan was established in 1988 should be supported.

Therefore, Thailand supports the single Method of the CPM report for this Issue.

Issue F: Measures to facilitate entering new assignments into the RR Appendix 30B List

1. Background

An administration which wants to convert its national allotment of RR Appendix **30B** into assignments in an economically viable manner very often needs to modify the initial characteristics of its national allotments, taking into account the latest available development and advancement in technology. For this purpose, the administration will make a submission and follow the procedures of Article 6 of RR Appendix **30B**. In so doing:

- a) when the submission is examined and published by the Bureau, the submission would need to coordinate with affected networks with higher priority;
- b) due to the conservative criteria used in RR Appendix **30B**, a large number of coordination requirements will be identified;
- c) networks can be designed with combinations of characteristics, possibly unrealistic, to obtain a high sensitivity to interference from later submissions of other administrations.

As a result, it may be difficult for an administration to successfully complete the coordination within the regulatory period.

According to the CPM report, there are 4 Methods to satisfy this issue.

2. Views and Proposals

Thailand is of the opinion that the simplification of the regulatory procedure to the using the frequency bands of RR Appendix 30B is needed. By means of this, Thailand supports the updating and restructuring the coordination trigger used in Appendix 30B to take into account technological advances and avoid some unnecessary coordination while assuring adequate protection of other satellite networks. Therefore, Thailand can accept Methods F1, F2, F3 and opposes Method F4 of the CPM Report.

Issue G: Updating the reference situation for Regions 1 and 3 networks under RR Appendices 30 and 30A when provisionally recorded assignments are converted into definitive recorded assignments

1. Background

§§ 4.1.18 to 4.1.20 were included in the RR based on a WRC-2000 decision, to be used in exceptional cases to overcome continuing disagreement of administrations of the affected networks to enter provisionally into the List and after being four months in use without complaint of harmful interference to give a chance to new or modified Article 4 networks to enter definitively in the Lists of RR Appendices **30** and **30A**.

The issue of updating the reference situation for Regions 1 and 3 networks under RR Appendices **30** and **30A** when provisionally recorded assignments are converted into definitive assignments was first raised during the CPM15-2 meeting. It was therefore too late to have this issue captured in the CPM Report. Subsequently, this issue was brought to the attention of the RRB-70 meeting in October 2015 (Document RRB-70/10), requesting that a Rule of Procedure (RoP) be prepared to outline the desired practice to be followed by the Bureau. RRB-70 however was of the view that such a RoP would consist in a change of the Radio Regulations and therefore was outside the authority of the RRB.

Following this decision, a proposal on this issue was submitted to WRC-15, which has the authority to make changes to the Radio Regulations (Document WRC-15/169). Since this proposal was made directly to the conference with no previous ITU-R studies, WRC-15 decided that:

“...it was felt that further study of this issue is required if this current practice is to be changed. ITU-R is therefore invited to study this issue under the standing agenda item 7 with the aim of finding an appropriate regulatory and technical solution to this issue.”

According to the CPM report, there are 3 Methods to satisfy this issue.

2. Views and Proposals

Thailand supports the modification and updating the current regulatory procedure for recording the assignment into the List for Regions 1 and 3 under RR Appendices 30 and 30A. Therefore, Thailand can accept Methods G1, G2 and opposes Method G of the CPM Report.

Issue H: Modifications to RR Appendix 4 data items to be provided for non-geostationary satellite systems

1. Background

The RR Appendix 4 data items provided in APIs and CR/Cs for satellite networks or systems are used by administrations to identify potential interference scenarios to their existing and planned systems and to formulate their comments under RR No. **9.3** and by the Bureau to perform the relevant examination including compliance with the RR Article **22** efpd limits and publish its findings in the BR IFIC for administrations to identify/validate potential interference scenarios to their existing and planned systems and to formulate their comments under RR No. **9.52**

respectively. Recent analysis performed for non-GSO satellite networks or systems have shown that, in some instances, there is a need for additional information in order to properly model the non-GSO satellite systems.

2. Views and Proposals

Thailand supports the extension of the data elements in RR Appendix 4 for submitting the APIs and notifications for frequency assignments to non-GSO satellite networks/systems in the frequency bands not subject to coordination for facilitating modelling of non-GSO.

Therefore, Thailand supports the single Method of the CPM report for this Issue.

Issue I: Modified regulatory procedure for non-GSO satellite systems with short-duration missions

1. Background

In recent years, an increasing number of academic institutions, amateur satellite organizations and government agencies have been developing non-GSO satellite systems with short duration missions using nano and picosatellites. The use of these types of satellites has presented various regulatory challenges, including difficulties for the notifying administrations to provide accurate RR Appendix 4 orbital characteristics at the beginning of the development cycle and, in some instances, not even prior to the launch of the satellites.

WRC-15 decided not to include the new proposal for modifications to the regulatory procedures for notifying satellite networks to accommodate nanosatellite and picosatellite missions and concluded that this matter could best be dealt with by the ITU-R under the standing WRC agenda item 7.

As a result, the ITU-R developed a method to address this issue that consists of modifications to the existing regulatory procedures for advanced publication and notification of satellite networks and systems that are not subject to Section II of RR Article 9 to facilitate the recording of non-GSO satellite systems with short-duration missions in the MIFR.

According to the CPM report, there are 2 Methods to satisfy this issue.

2. Views and Proposals

Thailand adopts the establishment of the simplified regulatory regime annexed to the new WRC Resolution, together with an associated regulatory regime for non-GSO satellite systems with short-duration missions to modify the regulatory process for short-duration missions.

Therefore, Thailand supports Method I2 of the CPM report.

Issue J: Pfd limit in Section 1, Annex 1 of RR Appendix 30

1. Background

Issue J deals with the possibility of the exceedance of the power flux-density (pfd) limit for the broadcasting-satellite service (BSS) networks in the List.

The pfd limit of $-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ was established for additional use in Regions 1 and 3 in order to protect BSS networks outside the coordination arc of ± 9 degrees. In the case that an administration applies the relevant provisions of RR Article **23** to request the exclusion of its territory from the service areas of BSS networks of other administrations, such BSS networks of other administrations are not entitled to be protected within the territory of the objecting administration. According to the idea above, the pfd limit of $-103.6 \text{ dB(W/(m}^2 \cdot 27 \text{ MHz))}$ may be exceeded only within the national territory of the notifying administration providing that, on the border areas and other territory of another country, this pfd limit is not exceeded.

According to the CPM report, there are 2 Methods to satisfy this issue.

2. Views and Proposals

Taking into account of the flexibility of BSS services, Thailand supports principle to allow the pfd limits given in Appendix 30 List assignment to be exceeded only within the national territory of the notifying administration provided that the assignment does not overlap with the guardbands as defined in Appendix 30 including that pfd limit is not exceeded on the border areas and other territory of another country.

Therefore, Thailand supports Method J1 of the CPM report.

Issue K: Difficulties for Part B examinations under § 4.1.12 or 4.2.16 of RR Appendices 30 and 30A and § 6.21 c) of RR Appendix 30B

1. Background

Examination under § 6.21 c) of RR Appendix **30B** is based on the assignments for which the Bureau has previously received complete information in accordance with § 6.1 (senior Network SR-Part A) even though the Network SR-Part B has already been published under § 6.23 or § 6.25 with much reduced characteristics and from that Part B publication, Network SR-Part A no longer exists in the Appendix **30B** databases. While, examination under § 4.1.12 or § 4.2.16 of RR Appendices **30** and **30A** is based on the completed information received by Bureau in accordance with § 4.1.3 or § 4.2.6 (Network SR-Part A) even though the Network SR-Part B has already been published under § 4.1.15 or § 4.2.19 with the reduced characteristics and from that Part B publication, Network SR-Part A no longer exists in the RR Appendices **30** and **30A** databases.

This creates difficulties to the notifying administration and may prevent its notice submitted under § 4.1.12 or § 4.2.16 of RR Appendices **30** and **30A** or § 6.17 of RR Appendix **30B** (Network JR-Part B) from entering into the List or Plan with favourable findings as the examination of its submission in respect of the senior network (Network SR-Part A) is unfavourable even though in reality, its network (Network JR-Part B) can coexist with the senior network in the List or Plan (Network SR-Part B) and if examination in respect of

Network SR is based on its Part B, the examination result will become favourable. As the results, it is proposed that the additional examination should be conducted.

2. Views and Proposals

In order to avoid over protection of Network SR based on the Part A characteristics which may be outdated and no longer valid, Thailand supports additional examination of satellite notices under § 4.1.12 and § 4.2.16 of RR Appendices **30** and **30A** and § 6.21 c) of RR Appendix **30B** for the Part B submission which have received as unfavourable finding.

Therefore, Thailand supports the single Method of the CPM report for this Issue.

Agenda Item 9.1:

to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention on the activities of the Radiocommunication Sector since WRC-15;

Issue 9.1.2: Resolution 761 (WRC-15) - Compatibility of International Mobile Telecommunications and broadcasting-satellite service (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3

1. Background

Pursuant to Resolution **761 (WRC-15)**, the regulatory and technical studies between International Mobile Telecommunications (IMT) and broadcasting-satellite service (sound) (BSS (sound)) in the frequency band 1 452-1 492 MHz in Regions 1 and 3 were conducted by ITU-R, taking into account IMT and BSS (sound) operational requirements.

ITU-R WP 4A and WP 5D are the responsible groups for this study. WP 4A and WP 5D have conducted the compatibility studies with respect to the protection of BSS (sound) and IMT respectively. WP 4A and WP 5D developed the 9 of possible actions for protecting IMT and BSS(sound) and those will be applied as stipulation or coordination threshold values in Radio Regulations as well as maintaining the status quo (i.e. no changes to the Radio Regulations) as follows.

TABLE 1

Possible actions with respect to WRC-19 agenda item 9.1, issue 9.1.2, in Regions 1 and 3, pursuant to Resolution 761 (WRC-15)

Possible action	Protection of IMT stations	Protection of BSS (sound) receivers
1	Maintain status quo (i.e. no changes to the Radio Regulations).	Maintain status quo (i.e. no changes to the Radio Regulations).
2	Maintain status quo (i.e. no changes to the Radio Regulations) for those countries for which the frequency band is not identified for IMT.	Maintain status quo (i.e. no changes to the Radio Regulations) for those countries for which the frequency band is not identified for IMT.

Possible action	Protection of IMT stations	Protection of BSS (sound) receivers
3	<p>Stipulate pfd limit(s) for BSS (sound) space stations in Regions 1 and 3. Three alternatives are available in this action.</p> <p><u>Alternative 1:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT mobile stations.</p> <p><u>Alternative 2:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT base and mobile stations.</p> <p><u>Alternative 3:</u> The pfd limit is stipulated in a new footnote taking into account the operational requirement of BSS (sound) system.</p>	Maintain status quo (i.e. no changes to the Radio Regulations).
4	<p>Stipulate pfd limit(s) for BSS (sound) space stations in some countries of Regions 1 and 3, specified in RR Nos. 5.346 and 5.346A. Three alternatives are available in this action.</p> <p><u>Alternative 1:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT mobile stations.</p> <p><u>Alternative 2:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT base and mobile stations.</p> <p><u>Alternative 3:</u> The pfd limit is stipulated in a new footnote taking into account the operational requirement of BSS (sound) system.</p>	Maintain status quo (i.e. no changes to the Radio Regulations).
5	Maintain status quo (i.e. no changes to the Radio Regulations).	Stipulate pfd limit for IMT stations by modification of RR Nos. 5.346 and 5.346A .
6	<p>Stipulate pfd limit(s) for BSS (sound) space stations in Regions 1 and 3. Three alternatives are available in this action.</p> <p><u>Alternative 1:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT mobile stations.</p> <p><u>Alternative 2:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT base and mobile stations.</p> <p><u>Alternative 3:</u> The pfd limit is stipulated in a new footnote taking into account the operational requirement of BSS (sound) system.</p>	Stipulate pfd limit for IMT stations by modification of RR Nos. 5.346 and 5.346A .
7	<p>Stipulate pfd limit(s) for BSS (sound) space stations. In some countries of Regions 1 and 3, specified in RR Nos. 5.346 and 5.346A. Three alternatives are available in this action.</p> <p><u>Alternative 1:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT mobile stations.</p> <p><u>Alternative 2:</u> The pfd limit is stipulated in RR Table 21-4 under RR No. 21.16 taking into account protection of IMT base and mobile stations.</p> <p><u>Alternative 3:</u> The pfd limit is stipulated in a new footnote taking into account the operational requirement of BSS (sound) system.</p>	Stipulate pfd limit for IMT stations by modification of RR Nos. 5.346 and 5.346A .

Possible action	Protection of IMT stations	Protection of BSS (sound) receivers
8	Stipulate a new coordination threshold for RR No. 9.11 based on pfd value in Regions 1 and 3. The pfd value is stipulated in a new footnote taking into account the e.i.r.p. value of 70.8 dBW for a space station of BSS (sound).	Stipulate a new coordination threshold for RR No. 9.19 based on pfd value to reach coexistence for protection of BSS (sound) receivers.
9	Stipulate a new coordination threshold for RR No. 9.11 based on pfd value in some countries of Regions 1 and 3, specified in RR Nos. 5.346 and 5.346A . The pfd value is stipulated in a new footnote taking into account the e.i.r.p. value of 70.8 dBW for a space station of BSS (sound).	Stipulate a new coordination threshold for RR No. 9.19 based on pfd value to reach coexistence for protection of BSS (sound) receivers.

Some of the possible actions described above could be included in a new WRC Resolution and Resolution **761 (WRC-15)** could then be suppressed. Alternatively, Resolution **761 (WRC-15)** could be revised.

2. Views and Proposals

Since the frequency band 1 452 - 1 492 MHz in Thailand is part of the frequency band that has been already identified for terrestrial IMT, Thailand is of the view that technical and operational measures are required to safeguard terrestrial IMT operating in the band 1 452 - 1 492 MHz as needed. Thailand supports possible Action 3 with the view to protect terrestrial IMT in this band.

Issue 9.1.3: Resolution 157 (WRC-15)

Study of technical and operational issues and regulatory provisions for new non-geostationary-satellite orbit systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz frequency bands allocated to the fixed-satellite service.

1. Background

Resolution **157 (WRC-15)** invites the ITU-R to study technical and operational issues and regulatory provisions for new non-geostationary-satellite orbit (non-GSO) systems in a number of frequency bands between 3 700 MHz and 7 025 MHz allocated to the fixed-satellite service, while ensuring that existing services are protected.

Specifically, in the frequency band 6 725-7 025 MHz, *resolves to invite the ITU Radiocommunication Sector d)* requests that the studies address the protection of feeder links for mobile-satellite service (MSS) systems operating in the space-to-Earth direction from unacceptable interference, pursuant to existing criteria, from co-frequency, non-GSO fixed-satellite service (FSS) system earth stations operating in the Earth-to-space direction.

In response to Resolution **157 (WRC-15)**, options have been developed to address issue 9.1.3 under WRC-19 agenda item 9.1.

2. Views and Proposals

Thailand supports the single method indicated on no change (NOC) to the Radio Regulations to satisfy agenda item 9.1, issue 9.1.3 based on CPM Report for the frequency 3 700 - 4 200 MHz, 4 500 - 4 800 MHz, 5 925 - 6 425 MHz, and 6 725 – 7 025 MHz.

Issue 9.1.9: Resolution 162 (WRC-15)

Studies relating to spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space)

1. Background

Satellite systems are increasingly being used to deliver broadband services with high data rates to accommodate user demand and service expectations worldwide. Next-generation satellite networks are expected to provide data rate services from 100 Mbit/s to greater than 1 Gbit/s on a single channel to all users regardless of location. Satellite systems enable the immediate connection of many subscribers, irrespective of their location, to broadband and Internet backbone networks with just one launch, compared to a point-by-point roll-out. By implementing advanced technologies such as spot-beam antennas and high frequency reuse factors, HTS reach many times the throughput of traditional satellites using the same amount of allocated spectrum, which leads to the reduction of Gigabits per second (Gbit/s) costs.

The limiting factor of HTS satellite networks is the amount of spectrum allocated to the forward link in the Earth-to-space segment (gateway-to-satellite link).

Current HTS systems are mainly operated in Ka-band and use the Earth-to-space allocations for both user links and gateway links, which leads to the scarcity of spectral resources in this frequency band. In order to achieve higher data rates and improve the services provided to end-users, it is proposed to use the allocation to FSS (Earth-to-space) in the 50/40 GHz frequency bands for the gateway uplink (from gateway to space station) and Ka-band allocations to FSS (Earth-to-space) for the user uplink (from user terminals to space station). Therefore, the consideration of new primary allocations to the FSS in the frequency band 51.4-52.4 GHz (Earth-to-space) limited to FSS gateway links is required.

The current frequency range of primary allocations to FSS (Earth-to-space) in the frequency bands 40/50 GHz in Regions 1, 2 and 3 is 42.5-43.5 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz. The two FSS Earth-to-space allocations in the frequency bands 47.2-50.2 GHz and 50.4-51.4 GHz are almost contiguous, making these 4 GHz allocations suitable for operation of wideband carriers. The additional allocation of FSS (Earth-to-space) in the 51.4-52.4 GHz frequency band will allow access to 5 GHz of almost contiguous spectrum for the uplink communications; in addition, the 42.5-43.5 GHz allocation would enable a total of 6 GHz of spectrum for Earth-to-space communications. This situation will make it more suitable for the operation of FSS systems providing high data rate services worldwide with satisfactory availabilities.

2. Views and Proposals

Thailand supports the single method indicated in the CPM report for new allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth to space), limited to FSS gateway links for geostationary orbit use while protecting currently allocated services in the same frequency band and in adjacent frequency bands.