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| **The 4th Meeting of the APT Conference Preparatory Group for WRC-19 (APG19-4)** | **APG19-4/INP-98** |
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China (People’s Republic of)

**preliminary views on WRC-19 agenda items 1.4, 1.5, 1.6, 7, 9.1 (issues 9.1.2, 9.1.3, 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*

**1. Background**

In the latest draft CPM text for WRC-19 agenda item 1.4, the study on revising the limitations in Annex 7 to Appendix 30 was consisted of nine cases and three methods to satisfy this item were presented. Method A proposed no change to Annex 7. Method B and C both proposed deletion of some limitations of Annex 7. Both methods proposed to delete limitations “A2b”, “A3b” and “A3c” and to retain limitations “A1b”, “A2c” and “B”. To guarantee the protection of frequency assignments with earth station receiving antenna size smaller than 60 cm (40 cm and 45 cm), Method B and C proposed to delete limitation “A3a” accompanied by draft new Resolution **[A14-LIMITA3] (WRC-19)**. Both methods also proposed the application of draft new Resolution **[B14-PRIORITY] (WRC-19)** after removing the relevant limitations in Annex 7 of the RR Appendix **30** **(Rev.WRC-15)**, giving priority to national assignments in the Regions 1 and 3 Plan with equivalent downlink protection margin values equal or below -10 dB. Method C is different from Method B in terms of deleting limitations “A1a” and “A2a”. Method C proposed the deletion of limitations “A1a” and “A2a” with the application of draft new Resolution **[C14-LIMIT-A1A2] (WRC-19)** with revised criteria for protection of future BSS networks.

The territory of China is barely visible from the orbital positions between 37.2 W and 10 E. Therefore relaxation of limitations mentioned in Annex 7 to Appendix 30 can not be of benefit in providing additional BSS satellite services to China. However, if the restrictions on BSS in Regions 1 and 2 are relaxed, it may affect China’s existing and future assignments or satellite networks such as the Appendix **30** Plan, List and FSS satellite networks. China will track the studies on the potential to affect sharing condition in the course of developing the Chinese view on this item.

**2. Preliminary Views**

China is of the view that any revisions of the limitations of Annex 7 of Radio Regulations Appendix 30 (Rev.WRC-15) should base on rigorous study, and the protection of current and future BSS/FSS assignments or satellite networks in the 11.7-12.75 GHz frequency band involved should be ensured.

**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****.*

**1 Background**

WRC-15 adopted footnote RR No. 5.527A and Resolution **156** (WRC-15) which allow FSS frequency bands 19.7-20.2 GHz and 29.5-30.0 GHz to be used by ESIM operating with geostationary space stations. Agenda item 1.5 of WRC-19 seeks to extend the operation of ESIM into frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz while ensuring protection of existing services allocated in the same frequency bands. The detailed requirements for studies under this agenda item are contained in Resolution **158** (WRC-15).

Resolution 158 (WRC-15) invites the ITU-R:

1. “to study the technical and operational characteristics and user requirements of different types of earth stations in motion that operate or plan to operate within geostationary FSS allocations in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz, including the use of spectrum to provide the envisioned services to various types of earth station in motion and the degree to which flexible access to spectrum can facilitate sharing with services identified in *recognizing further* *a)* to *n)”*;

2. “to study sharing and compatibility between earth stations in motion operating with geostationary FSS networks and current and planned stations of existing services allocated in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz to ensure protection of, and not impose undue constraints on, services allocated in those frequency bands, and taking into account *recognizing further* *a)* to *n)”*;

3. “to develop, for different types of earth stations in motion and different portions of the frequency bands studied, technical conditions and regulatory provisions for their operation, taking into account the results of the studies above”.

Resolution 158 (WRC-15) also *resolves to further invite the 2019 World Radiocommunication Conference* “to consider the results of the above studies and take necessary actions, as appropriate, provided that the results of the studies referred to in *resolves to invite ITU-R* are complete and agreed by ITU-R study groups.”

**2 Results of sharing studies in ITU-R**

As the responsible group for WRC-15 Agenda Item 1.5, WP4A conducted the sharing and compatibility studies between ESIM and other services allocated in the 17.7-19.7 GHz and 27.5-29.5 GHz frequency bands (Annex 12,13,14,15 to [Document 4A/826](https://www.itu.int/md/R15-WP4A-C-0826/en)), based on which, WP4A has finished its work to prepare the draft of CPM text in its 6th meeting in Geneva, 3-14 July 2018.

**2.1 Sharing studies**

The results of the sharing and compatibility studies are as followings:

**Coexistence with terrestrial services in the 17.7-19.7 GHz band:**

The ITU-R examined sharing conditions for ESIM with terrestrial services in the 17.7-19.7 GHz frequency band and concluded that there would be potential interference from transmitting stations of terrestrial services to ESIM receivers. The ESIM therefore should operate under the condition of not claiming protection from terrestrial services operating in accordance with RR.

**Protection of terrestrial services in the 27.5-29.5 GHz band:**

Studies concluded that in the band 27.5-29.5 GHz, terrestrial fixed and mobile service stations can be protected as follows:

1. Aeronautical ESIM (A-ESIM) should comply with PFD limits at the surface of the Earth, when in line-of-sight of a territory of an administration. The same principle for the protection of terrestrial service stations is applied to aircraft earth station operation in the band 14-14.5 GHz. Different PFD masks have been proposed and one option in the example Resolution also proposes to combine an altitude limit with one of the PFD limits on A-ESIM.
2. Maritime ESIM (M-ESIM) should comply with a minimum distance from the low-water mark of a coastal state and an associated maximum e.i.r.p spectral density limit towards that coastal state. The same principle for the protection of terrestrial service stations is applied to operation of Earth Stations on Vessels (ESV) in the bands 5 925-6 425 GHz and 14.0-14.5 GHz. Distances in the range 60 to 120 km have been proposed by different administrations.
3. Land ESIM (L-ESIM) should operate under the condition of no interference into terrestrial stations in neighboring countries until coordination between concerned administrations is complete.

The limits defined for a) and b) above can only be exceeded with prior agreement from the concerned administrations.

WP4A has agreed that M-ESIMs that meet the limit in item b) above are deemed to have met their obligation not to cause interference to terrestrial services and no further coordination is required with coastal administrations prior to M-ESIM operation. However, WP4A did not reach agreement that A-ESIM that meet the limit in item a) above are deemed to have met their obligation not to cause interference to terrestrial services. Some administrations believe that the limits in item a) should be used as guidelines that administrations can use when they authorize A-ESIM on their territory.

**Coexistence with space services in the 17.7-19.7 GHz band:**

Studies concluded that if ESIM operation remains within the envelope of the GSO FSS network with which ESIM communicates, the operation of other space services would not be constrained. It is consequently noted that ESIM should not claim more protection from non-GSO FSS systems operating in the band 17.8-18.6 GHz than afforded by the EPFD limits specified in RR No. 22.5C.

Additional provisions are only required for BSS feeder link operation in the band 17.7-18.4 GHz (Earth-to-space) which is in the opposite direction to ESIM operation (space-to-Earth). For this specific scenario, WP 4A concluded that ESIM should not claim protection from BSS feeder link operation in the band 17.7-18.4 GHz.

**Protection of space services in the 27.5-29.5 GHz band:**

Studies concluded that if ESIM transmissions remain within the envelope of the GSO FSS network with which ESIM communicates, the interference environment for other space services would remain unchanged and would therefore be acceptable.

ITU-R studies developed possible additional provisions to provide additional protection of non-GSO FSS systems. These provisions are included in Annex 1 of the example Resolution in CPM Report. WP 4A agreed that these limits should apply in the band 27.5-28.6 GHz, where RR No. 22.2 applies and therefore non-GSO FSS systems and GSO FSS networks do not coordinate. Some administrations believe that the same limits should apply in the band 28.6-29.1 GHz, where coordination under RR No. 9.11A applies.

**2.2 Methods to satisfy the agenda item**

The Draft CPM Report to WRC-19 has two Methods to satisfy the Agenda item:

*Method A*: No changes to the Radio Regulations.

*Method B*: Add a new footnote in RR Article **5** that refers to a new WRC Resolution with technical, operational and regulatory conditions for the operation of ESIM while ensuring protection of allocated services.

The new WRC Resolution is based on the following elements:

* ESIMs should operate within the envelope of the earth station characteristics in the FSS network filing. This will generally ensure that ESIMs don’t cause more interference to other space services than other earth station types that are already able to operate in these bands;
* In the downlink band (17.7-19.7 GHz) ESIMs only receive and hence cannot cause interference to other services. ESIMs should therefore be allowed to operate on a non-protected basis in this band;
* Limits should apply to ensure that ESIMs operate compatibly with other services in the uplink band (27.5-29.5 GHz);
* In order to meet the above operational limitations, ESIM shall employ techniques to track the associated GSO FSS station and be subject to permanent network monitoring and control with the possibility to cease emissions as necessary; and
* Guidance is provided to administrations for the authorization of ESIM operations.

**3 Preliminary View**

China supports Method B of the draft CPM text developed by WP4A.

China supports the establishment of regulatory and technical framework for the operation of ESIMs in the 17.7-19.7 GHz and 27.5-29.5 GHz frequency bands, while ensuring that ESIMs, do not cause unacceptable interference to other services and systems operating in the same bands in accordance with the Radio Regulations.

The regulatory and technical framework for ESIMs’ operating needs to be as simple and practicable as possible. The following conditions are considered in the 27.5-29.5 GHz bands as a way forward:

**Maritime ESIM** – together with other technical conditions, minimum distance of 70 km from the low-water mark officially recognized by coastal states similar to the method adopted in Resolution **902 (WRC-03)**. ESIM should comply with this minimum distance unless prior agreement of the concerned administrations has been given.

**Aircraft ESIM** – together with other technical conditions, the pfd limits on the earth’s surface should be used to ensure protection of terrestrial systems. ESIMs should comply with the pfd limits unless prior agreement of the concerned administrations has been given.

**Land ESIM** – operating within national boundaries no specific regulatory action or amendments to the Radio Regulations at WRC-19 are needed.

Regarding the 17.7-19.7 GHz band, China is of the view that ESIMs shall not claim protection from the fixed and mobile services in accordance with the Radio Regulations.

**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)****;*

**1. Background**

According to the information of the WRC-15, FSS systems based on the use of new technologies above 30 GHz and associated with both geostationary (GSO) and non-geostationary (non-GSO) satellite constellations are capable of providing high-capacity and low-cost means of communication even to the most isolated regions of the world, and there are GSO satellite networks and non-GSO satellite systems operating and/or planned for near-term operation in the frequency bands allocated to the FSS in the range 37.5-51.4 GHz. However, the regulatory provisions for limitation of the non-geostationary fixed-satellite services satellite systems operating in the 37.5‑51.4 GHz frequency bands while ensuring protection of GSO satellite networks has not been ascertained.

Meanwhile, Article 22 of the Radio Regulations contains provisions to ensure compatibility of non-GSO FSS operations with GSO networks in the 14/11 GHz and 30/20 GHz frequency bands. Among these provisions are uplink and downlink equivalent power flux density (epfd↑ and epfd↓) limits to protect GSO networks from unacceptable interference pursuant to RR No. 22.2. There are currently no technical measures and regulatory provisions for sharing between non-GSO systems and GSO networks in the 50/40 GHz frequency bands.

Several compatibility studies carried out in ITU-R between non-GSO FSS systems and EESS (passive) have shown that the limits currently in Resolution **750 (Rev.WRC-15)** are not sufficient for the protection of EESS (passive) in the adjacent band 50.2-50.4 GHz.

The draft CPM Report framework has been developed. There are four methods which support to address WRC-19 agenda item 1.6.

**2. Preliminary Views**

China's preliminary views are as follows:

– China supports current ITU-R studies of technical and operational issues and regulatory provisions for the operation of non-GSO FSS satellite systems in the frequency bands 37.5-42.5 GHz (space-to-Earth) and 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space);

– GSO satellite networks in the FSS, MSS and BSS should be protected, without limiting or unduly constraining the future development of GSO networks across those bands, and without modifying the provisions of RR Article 21;

– China supports to study the effects of aggregate FSS interference from non-GSO systems operating in the relevant bands, to ensure the protection of the EESS (passive) and RAS.

**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)****, in order to facilitate rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary satellite orbit;*

# 1 Background

In response to Resolution 86 (Rev. Marrakesh, 2002), WRC-19 is invited by Resolution 86 (Rev. WRC-07)to consider under its standing Agenda Item 7 any proposals which deal with deficiencies and improvements in the advance publication, coordination, notification and recording procedures for frequency assignments pertaining to space service, including the associated technical characteristics, and the related Appendices of the Radio Regulations (RR).

Although Agenda Item 7 was not changed by WRC-15, the ITU-R meeting conditions have changed since the last study period as the Special Committee has been suppressed and the WP 4A meetings have been prolonged.

In the course of the implementation of the Resolutions as from the Plenipotentiary Conference (Minneapolis, 1998), various administrations and the Bureau of the ITU have been contributing to the improvement of the satellite network procedures, eliminating the deficiencies thereof and transforming the provisions in the Rules of Procedures into the RR. Some administrations suggested only considering the issues identified by the relevant Working Parties prior to the deadline for the draft CPM Report and included into the draft CPM Report, in order to give administrations and regional organizations sufficient time to draw up a position and develop regulatory texts.

# 2 Preliminary Views on Specific Issues

A number of satellite network regulatory issues were raised and discussed in the previous Working Party 4A (WP4A) meetings on Regulatory / Procedural Matters. Until the 6th WP 4A meeting during WRC-19 study cycle, issues A to M under Agenda item 7 were identified and included in the draft CPM Report to WRC-19. For all of these issues, methods have been proposed to satisfy them. Preliminary views on a number of issues are submitted for consideration in the APG 19-4 meeting as follows:

1. **Issue A****:** BIU of frequency assignments to non-GSO satellite systems

WRC-12 and WRC-15 adopted into the Radio Regulations a series of specific provisions – including RR No. **11.44B** – that clarified the bringing into use (BIU) requirements and bringing back into use requirements for frequency assignments to a space station in a GSO network. However, there are no specific provisions for the BIU for frequency assignments to a space station in a non-GSO satellite systems.

Historically, and to this day, the Bureau considers that a frequency assignment to any non-GSO system has been brought into use when one satellite from a planned system in a particular frequency band has been placed into service – irrespective of the number of satellites or of the number of orbital planes indicated in the notification information provided under No. **11.2**. According to RR No. **13.12A**, this practice is reflected in the Rules of Procedure for No. **11.44** (*see* Rule of Procedure for No. **11.44**, Section 2 (MOD RRB16/58)).

The BR Director brought to the attention of the WRC-15 in his Report under 9.2 that the conference may wish to consider re-defining the notion of BIU for non-GSO satellite networks as this could lead to spectrum warehousing and resurgence of so-called “paper satellite networks”. WRC-15 discussed the issue and decided to invite ITU-R to examine, under Agenda Item 7, the possible development of regulatory provisions requiring additional milestones beyond those under Nos. 11.25 and 11.44 with regards to non-GSO systems.

WP4A agreed to identify BIU of frequency assignments to non-GSO satellite systems as Issue A. WP4A has developed a working document towards a Preliminary Draft New Report on studies relating to the BIU of frequency assignments for all non-GSO satellite systems and consideration of a milestone-based deployment approach for non-GSO satellite systems in specific bands and services, and a draft CPM text.

The draft CPM text consists in two general conclusions, each with multiple options for implementation. First, for BIU of frequency assignments to non-GSO systems, BIU should apply for frequency assignments of all non-GSO satellite systems in all bands and services with the deployment of one or more satellites into a notified orbital plane, and three options were identified for the period for which the satellite capable of transmitting or receiving the frequency assignments must be deployed in a notified orbital plane. Second, for non-GSO satellite systems in specific bands and frequencies, the draft CPM text contains a milestone-based approach established in a new WRC Resolution that would allow an additional period beyond seven years for the deployment of the number of orbital planes and the number of satellites per orbital plane contained in the filing. For this single option, seven examples of possible implementations (A–G) to the milestone-based approach are proposed. The draft CPM text also contains a single example Draft New WRC Resolution (in section 3/7/1.5.2.3 in Annex 30 of 4A/826) including several areas where options are listed.

**Preliminary** **Views on Issue A**:

* China supports that a solution to address this issue should follow the elements of seven guiding principles (in section 3/7/1.3 in Annex 30 of 4A/826) in the draft CPM text.
* China supports that the definition of the BIU of frequency assignments to non-GSO systems should be in accordance with the current practice as contained in the Rules of Procedure.
* China supports that a milestone-based approach for the maintenance of the recording in the MIFR of assignments to non-GSO systems should be associated with a minimum number of satellites to be deployed over time.
* China supports three milestones to be applied to networks recorded in the MIFR. Recognizing that some constellations may deploy some satellites but may fail to meet the milestones, a provision is proposed to reduce the number of satellites recorded in the MIFR while preserving the rights for the already in-orbit satellites. The reduction of the characteristics of the constellation recorded in the MIFR should be based on the number of actual satellites launched.
* China supports that any milestone-based approach should be applicable to FSS/BSS/MSS and other primary satellite services in the same direction as these services at least in the specific Ku, Ka and Q/V bands.
* China supports that those systems brought into use and notified, but not fully deployed before a date to be set by the Conference, will have the same regulatory certainty as that available to those systems which will be brought into use and notified after this date. For those systems brought into use and notified, but not fully deployed before a date to be set by the Conference, appropriate transitional measures may need to be considered in order to allow administrations to have sufficient time to adapt their current development and deployment schedules to meet milestones, as appropriate.

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

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 8º
* FSS vs MSS: ΔT/T > 6%
* MSS vs MSS: ΔT/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 ΔT/T > 6% criteria.

WRC-19 agenda item 7, Issue B, proposes the introduction of the coordination arc with a value of 8 degrees as coordination criteria between FSS and MSS systems and MSS systems, in the frequency bands 29.5-30 GHz (Earth-to-space)/19.7-20.2 GHz (space-to-Earth) in all 3 Regions, as substitution of the existing trigger of coordination ΔT/T > 6%. Two methods are proposed to satisfy this issue. Method B1 propose NOC to RR. Method B2 propose to use of the coordination arc with a value of 8 degrees as coordination criteria, to determine if coordination is required between FSS and MSS systems and between MSS systems in the frequency bands 29.5-30 GHz (Earth-to-space)/19.7-20.2 GHz (space-to-Earth), in all 3 Regions, replacing the existing coordination criteria ΔT/T > 6%.

**Preliminary Views on Issue B**: In order to make more efficient the coordination procedures, China supports that coordination arc criteria would substitute the ΔT/T>6% criteria that currently applies, while keeping the possibility for Administrations to request ΔT/T criteria under No **9.41**, as outlined in Method B2 in the draft CPM text.

1. **Issue C:** Issues for which consensus was readily achieved in ITU-R

During discussion at several meetings of WP4A, it was recognized that sub-issues under Issue C were quite straightforward which means consensus was reached and a single “method” was proposed. Currently seven sub-topics were identified under Issue C.

* C1: AR11 and AP**30/30A/30B** discrepancies
* C2: Frequency bands submitted under AP**30B** Article **6**
* C3: AP**30B** MOD to Article **6** No. **6.10**
* C4: AP**30/30A** single AP4 notice for List and Notification
* C5: MOD to No. **11.46** and six month resubmission
* C6: AP**30B** single AP**4** notice for List and Notification
* C7: re-introducing a regulatory option to capture obtaining agreements for a specific period

**Preliminary Views on Issue C**: For issues C1 to C7, China support a single method in relevant draft CPM text to address these sub-topics under Issue C for improvements of RR.

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

Following No. **9.36.2** of RR, the Bureau publishes a “definitive list” of those networks, systems and earth stations with which coordination under RR Nos. **9.7**, **9.7A** and **9.7B** needs to be effected once a coordination request for a new network or system is processed. Such a list is published in the relevant Special Section of BR IFIC. However, in the cases of coordination under RR Nos. **9.12**, **9.12A** and **9.13**, the Bureau does not publish a list of the satellite networks or systems potentially affected to complement the list of administrations potentially affected by incoming satellite networks or systems. One proposal was made to align two practices to ease the burden currently born by administrations.

Issue D addressed the proposal that the Bureau publish in the CR/D special section the “definitive lists” of those specific GSO networks or non-GSO systems, as appropriate, with which coordination under Nos. 9.12, 9.12A and 9.13 needs to be effected, similarly to what is currently done under the provisions of No 9.36.2. WP4A meeting developed preliminary draft CPM text on this issue, and three methods were proposed. Method D1 proposes NOC to the RR; Method D2 proposes to modify RR No. **9.36.1** in order for BR to publish a pre-compiled list of satellite networks and/or systems potentially affected for information in the CR/C Special Section, as well as modifying RR Nos. **9.52C** and **9.53A** in order for BR to publish a definitive list of satellite networks and/or systems to be included in the CR/D Special Section; Method D3 is the same as Method D2 for RR **No. 9.36.1** but proposes NOC for the rest of RR Article **9** in order to have the list of satellite networks or systems potentially affected for information only, even at CR/D stage.

**Preliminary Views on Issue D**: China supports that the Bureau publish in the CR/D special section the “definitive lists” of those specific GSO networks or non-GSO systems, as appropriate, with which coordination under Nos. **9.12**, **9.12A** or **9.13** needs to be effected, as outlined in Method D2 in the draft CPM text.

1. **Issue E:** Resolution related to RR Appendix **30B**

Issue E is considering a draft new Resolution with a special procedure to be applied once for submissions with national service and coverage area by administrations not having any networks in the Appendix **30B** List or under coordination. This new Resolution would facilitate access for these administrations and avoid overprotection and unnecessary coordination.

At the 6th meeting of WP 4A in July 2018, draft CPM text was developed and finalized as outlined in Annex 34 of the Chairman’s Report 4A/826 with the draft new Resolution as the single method to satisfy the issue.

**Preliminary Views on Issue E**: China supports the WRC Resolution as contained in the draft CPM text.

1. **Issue F&G:**

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

This issue proposes to revise and restructure the coordination triggers used in Appendix **30B** to take into account technological advances and the development of the use of the geostationary orbit to facilitate access for newcomers by avoiding overprotection and unnecessary coordination requirements. Draft CPM text was captured as draft CPM text in Annex 35 of the Chairman’s report 4A/826, containing two Methods to satisfy the issue. Method F1 proposes the modifications to Annex 3 and 4 of Appendix **30B** by introducing a reduced coordination arc and mechanisms. Method F2 proposes No Change to the RR.

**Issue G:** Updating the reference situation for networks under RR Appendices **30** and **30A** when provisional recording is used

This issue considers conditions to change provisional recording to definitive and update the reference situation for networks under Appendices **30** and **30A**. Draft CPM text was captured in Annex 36 to the Chairman’s Report 4A/826, containing three Methods to satisfy the issue. Method G1 proposes to modify § 4.1.18bis of Appendices **30** and **30A**. Method G2 proposes to modify § 4.1.18 and § 4.1.18bis of Appendices **30** and **30A**. Method G3 proposes No Change to the RR.

**Preliminary Views on Issue F&G**: Further study on these issues is needed with an aim to find the solution to address concerns raised by some administrations.

1. **Issue H:** Modifications to RR Appendix **4** items to be provided for non-geostationary satellite systems not subject to the procedures of Section II of RR Article **9**

This issue addresses the requirement to provide additional Appendix 4 data elements to enhance the capability of administrations to model non-GSO satellite orbits based on the information provided in the API publications for satellite system not subject to coordination.

WP 4A concluded that in order to assess the impact of the limited information on the ability to model properly NGSO satellite orbit, there is a need to consider the different type of orbits case by case. Only one method to satisfy the issue has been identified, proposing to include the new items in RR Appendix 4 for APIs.

**Preliminary Views on Issue H**: China supports the only method outlined in draft CPM text to address this issue.

1. **Issue I:** Additional RR Appendix **4** data items to be provided for non-geostationary satellite systems with multiple orbital planes

Issue I addresses the requirement to provide additional Appendix **4** data elements to enhance the capability of administrations to model non-GSO satellite networks or systems based on the information provided in the API and CR/C publications, as applicable.

At the 6th meeting of WP 4A in July 2018, draft CPM text was agreed and captured in in Annex 38 to the Chairman’s Report 4A/826 with only one method to satisfy the issue including the two proposed changes to RR Appendix **4**.

**Preliminary Views on Issue I**: China supports the only method outlined in draft CPM text to address this issue.

1. **Issue J:** Modifications of Section 1, Annex 1 of RR **AP30**, PFD Limit

The 4th meeting of WP 4A in October 2017 received one contribution (4A/398) which further developed their initial proposal presented at the 3rd meeting of WP 4A in May 2017 proposing that § 5.2.1 d) of RR Appendix **30**, specifying the limit of −103.6 dB(W/(m2 · 27 MHz)), could be exceeded under some conditions and thereby enabling new broadcasting satellite services like UHDTV to be provided. The input added conditions that:

* the pfd exceedance from -103.6 dB(W/(m2 · 27 MHz)) is only allowed for the notifying administration over its national territory and is not applicable to networks submitted by an international satellite organization or an administration that acts on behalf of a group of named administrations.
* to ensure the protection of services in adjacent bands, the frequency assignment should not overlap with the Regions 1 and 3 guardbands.

BR clarified that the pfd levels will not be checked over sea areas so unfavorable findings will only be given if -103.6 dB(W/(m2 · 27 MHz)) is exceeded over the landmass of neighboring countries. With these improvements, the 4th meeting of WP 4A agreed for the proposal to become a new issue under AI 7.

At the 6th meeting of WP 4A in July 2018, draft CPM text was finalized and captured in Annex 39 to the Chairman’s Report 4A/826, which contains two Methods to satisfy the issue. Method J1 is based on the proponent’s initiative modifying § 5.2.1d) of RR Appendix 30, allowing to exceed the limit of −103.6 dB(W/(m2 · 27 MHz)) under some conditions. Method J2 proposes No Change to the RR.

**Preliminary Views on Issue J**: China does not support modification of a hard pfd limit (−103.6 dB(W/(m2· 27 MHz) which is included in Annex **1** to RR Appendix **30**.

1. **Issue K:** Difficulties for PART B examinations under § 4.1.12 or 4.2.16 of RR Appendixes **30** and **30A** and § 6.21 c) of RR Appendix **30B**

Issue K is addressing difficulties in Part B examinations for Part B submissions by proposing that the examination under RR Appendix **30B** § **6.21** c) is to be performed in two steps, if needed, to better reflect the actual situation and thus increase the efficiency of spectrum use.

At the February/March 2018 meeting of WP4A, it was further proposed to apply the same principle under § 5.2.1 of RR Appendix **30** and § 5.2.1 of RR Appendix **30A** as proposed for § 6.21 of RR Appendix **30B**.

At the 6th meeting of WP 4A in July 2018, draft CPM text for this issue was finalized and captured in Annex 40 to the Chairman’s Report 4A/826 consisting only one method.

**Preliminary Views on Issue K**: To increase the efficiency of spectrum use, China supports the single method in the draft CPM text.

1. **Issue L:** update to Appendix **4** data elements required for RR Article **22** epfd verification after revision of Recommendation ITU-R S.1503

Issue L is considering elements for update of RR Appendix **4** to accommodate the update of Recommendation ITU-R S.1503, specifically for 4 data elements required for RR Article **22** epfd verification.

At the 6th meeting of WP 4A in July 2018, no inputs were received on this issue and the previously developed text was agreed as draft CPM text and captured in Annex 41 to the Chairman’s Report 4A/826 with only one method to satisfy the issue.

**Preliminary Views on Issue K**: China supports revision of RR Appendix **4** as a consequence to the Recommendation ITU-R S.1503-3 coming into force, as outlined in the single method in the draft CPM text.

1. **Issue M:** simplified regulatory regime for non-GSO satellite systems with short duration missions

Issue M is a new issue under Agenda item 7 initiated at the 6th meeting of WP 4A in July 2018 considering a draft new Resolution with a special simplified procedure to be applied for non-GSO satellite systems with short duration missions not subject to Section II of RR Article **9**.

**Preliminary Views on Issue K**: China supports regulatory the principles of the draft new WRC Resolution together with the associated regulatory regime. However, the amount of time of 4 months for comments raised by administrations following a publication of an API shall not be changed.

**Agenda Item 9.1 (issue 9.1.2):**

*to conduct, in time for WRC 19, the appropriate regulatory and technical studies, with a view to ensuring the compatibility of IMT and BSS (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3 in accordance with Resolution* ***761 (WRC 15)****, taking into account IMT and BSS (sound) operational requirements.*

**1. Background**

**1.1. Introduction**

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.

The purpose of the studies is to respond to *resolves to invite ITU-R* as contained in the Resolution **761 (WRC-15)** in order to enable WRC-19 to decide on the matter as appropriate.

The frequency band 1 452-1 492 MHz is allocated to the fixed service (FS), mobile service (MS), broadcasting service (BS) and broadcasting-satellite service (BSS). Based on the outcome of WRC-15, the frequency band 1 452-1 492 MHz is identified for use by Regions 1 and 3 administrations wishing to implement IMT in accordance with Resolution **223 (Rev.WRC-15)** and Resolution **761 (WRC-15)** (see RR Nos. **5.346** and **5.346A**). Pursuant to Resolution **528** (**Rev.WRC-15**), in the interim period, broadcasting-satellite systems may only be introduced within the upper 25 MHz of this frequency band in accordance with the procedures contained in Sections A to C of Resolution **33 (Rev.WRC 15)**, or in RR Articles 9 to 14, as appropriate (see resolves 1 and 2 of Resolution **33 (Rev.WRC-15)**). The complementary terrestrial service may be introduced during this interim period subject to coordination with administrations whose services may be affected.

Currently, RR No. **9.11** applies with respect to the coordination for potential interference from a BSS (sound) space station into IMT receivers. Meanwhile, RR No. **9.19** applies with respect to the coordination for potential interference from IMT systems into the BSS (sound) receivers across the border between different countries within the satellite network service area. In addition, associated Resolutions **33 (Rev.WRC-15)**, **507 (Rev.WRC-15)** and **528 (Rev.WRC-15)** apply.

**1.2 ITU-R on-going studies**

In accordance with Resolution **761 (WRC-15)**, ITU-R has been conducting sharing studies related to IMT and BSS (sound) systems, the current progress of which is introduced as follows:

**BSS (sound) protection requirements:**

Pursuant to Resolution **223 (Rev.WRC-15)**, the frequency band 1 452-1 492 MHz was identified for use by administrations wishing to implement IMT since WRC-15. From the viewpoint of avoiding interference, an exclusive use for the BSS (sound) may be preferred, in which complementary terrestrial sound broadcasting deployment is practical. Recognizing that it is unfeasible for BSS (sound) and IMT to coexist in the same frequency band within 1 452-1 492 MHz and in the same service area, the operation of IMT systems may cause potential interference into the BSS (sound) earth stations. During the ITU-R studies, it was agreed that the I/N ratio of –12.2 dB be used as the protection criteria for BSS (sound) receiver, and can be treated as the BSS (sound) receiver protection requirement from IMT single-entry interference across national borders.

**IMT protection requirements:**

With respect to the characteristics of IMT systems to be used for sharing and compatibility studies, the parameters of IMT base stations and mobile stations are defined in the Report [ITU-R M.2292](https://www.itu.int/pub/R-REP-M.2292) in which the *I/N* of the protection criterion for IMT base stations and mobile stations is –6 dB, respectively.

With respect to the protection of IMT systems, for which the coordination agreement has been reached, the administration responsible for terrestrial service may send to the Bureau the information concerning those stations covered by this agreement which are intended to be notified, of which the Bureau shall consider as notification relating to existing terrestrial stations or to be brought into use within next three years, in accordance with RR No. **9.52B**. In that case, should these terrestrial stations be brought into use within next three years which are covered by this agreement, they would be sufficiently protected for the long-term period after the date of entry into force of agreement.

**Draft CPM Report:**

Under WRC-19 agenda item 9.1, issue 9.1.2, WP 4A and WP 5D are responsible for the studies with respect to the BSS (sound) and IMT, respectively. The draft CPM Report has been prepared on the basis of draft CPM texts developed by the responsible ITU-R groups involved in the preparation for WRC-19, which WP 4A has finalized to prepare in its 6th meeting in Geneva, 3-14 July 2018.

The Draft CPM Report to WRC-19 has prepared 8 possible actions with respect to WRC-19 agenda item 9.1, issue 9.1.2 as follows:

Possible action 1: Maintain status quo (i.e. no changes to the Radio Regulations)

This action proposes to maintain the status quo (i.e. no changes to the Radio Regulations) since the current regulations and technical conditions to ensure compatibility of IMT and BSS (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3 are sufficient and their change is not required.

Possible action 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

This action proposes to maintain the status quo (i.e. no changes to the Radio Regulations) with respect to the countries for which the frequency band is not identified for IMT. With respect to the countries where IMT is identified the modifications to current provisions can be applied in the Radio Regulations appropriately.

Possible action 3: Maintain status quo (i.e. no changes to the Radio Regulations) for the protection of BSS (sound) and stipulate pfd limits for the protection of IMT in Regions 1 and 3

This action proposes to maintain the status quo (i.e. no changes to the Radio Regulations) for the protection of the BSS (sound) receivers and to stipulate pfd limitation to BSS (sound) space stations for the protection of IMT. Alternatives 1 and 2 stipulate the pfd limit(s) in RR Table **21-4** under RR No. **21.16**, taking into account protection of IMT, pursuant to Resolution **761 (WRC-15)**.

In addition, alternative 3 stipulates the pfd limit(s) in a new footnote, taking into account the operational requirement of BSS (sound) system pursuant to Resolution **761 (WRC-15)**.

Possible action 4: Maintain status quo (i.e. no changes to the Radio Regulations) for the protection of IMT and stipulate pfd limits for the protection of BSS (sound) in Regions 1 and 3

This action proposes to maintain the status quo (i.e. no changes to the Radio Regulations) for the protection of IMT stations and to stipulate pfd limitation to IMT for the protection of the BSS (sound) receivers by modification of RR Nos. **5.346** and **5.346A**.

Possible action 5: Maintain status quo (i.e. no changes to the Radio Regulations) for the protection of BSS (sound) and stipulate a new coordination threshold for the protection of IMT in Regions 1 and 3

This action proposes to maintain the status quo (i.e. no changes to the Radio Regulations) for the protection of the BSS (sound) receivers, and to stipulate a coordination threshold for RR No. **9.11** based on new pfd values to reach coexistence.

Possible action 6: Maintain status quo (i.e. no changes to the Radio Regulations) for the protection of IMT and stipulate a new coordination threshold for the protection of BSS (sound) in Regions 1 and 3

This action proposes to maintain the status quo (i.e. no changes to the Radio Regulations) for the protection of IMT stations and to stipulate a coordination threshold for RR No. **9.19** based on new pfd values to reach coexistence for protection of BSS (sound) in Regions 1 and 3.

Possible action 7: Stipulate pfd limits for the protection of both IMT and BSS (sound) in Regions 1 and 3

The protection of IMT stations is the same as that in possible action 3. The protection of BSS (sound) receivers is the same as that in possible action 4.

Possible action 8: Stipulate a new coordination threshold for the protection of both IMT and BSS (sound) in Regions 1 and 3

The protection of IMT stations is the same as that in possible action 5. The protection of BSS (sound) receivers is the same as that in possible action 6.

**2. Preliminary Views**

Based on the above, China is of the following preliminary views:

1. The principle for all allocation frequency for either terrestrial or space service should not establish undue constraints on the services to which the frequency band is allocated. Furthermore, the pfd limitation when it is agreed to be proposed should firstly cover existing and planned BSS (sound) operational requirements pursuant to Resolution **761 (WRC-15)**, where it is imposed for BSS (sound) space station in the frequency band 1 452-1 492 MHz in Table **21-4** under RR No. **21.16**. China proposes that there should be no pfd mandatory limitation in the RR Art. **21** to the BSS (sound) space station in the 1 452-1 492 MHz frequency band;
2. Considering that the current Radio Regulation and technical conditions could sufficiently ensure compatibility of IMT and broadcasting-satellite service (BSS) (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3, China supports NOC as the possible action with respect to Issue 9.1.2.

**Agenda Item 9.1 (issue 9.1.3):**

*to study 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, in accordance with Resolution* ***157 (WRC-15)****.*

**1．Background**

Article 21 power flux-density (pfd) limits and Article 22 equivalent power flux-density (epfd↓) limits in the frequency band 3 700-4 200 MHz (space-to-Earth) and the Article 22 epfd↑ limits in the frequency band 5 925-6 725 MHz (Earth-to-space) were developed at WRC-03 based on a particular highly-elliptical orbit (HEO) configuration, while new non-GSO systems that seek to operate in these frequency bands may utilize different types of orbits.

Article 22 does not contain epfd↓ and epfd↑ limits for non-GSO systems in the frequency bands 4 500-4 800 MHz (space-to-Earth) and 6 725-7 025 MHz (Earth-to-space) allocated to the FSS, the use of which is subject to the provisions of Appendix 30B.

As indicated in the BR Director’s Report to WRC-15, there may be a need for “reviewing or confirming” assumptions that led to current values of the Article 21 and Article 22 power limits, taking into account the characteristics of systems recently submitted “and the overall trend for a growing interest in operating non-GSO FSS systems, with a view to ensure that all existing services are adequately protected”. Issue 9.1.3 was identified under agenda item 9.1 that called for the study of technical and operational issues and regulatory provisions for new non-GSO 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.

Working Party 4A (WP4A) has been identified as the responsible ITU-R group for the studies on WRC-15 Agenda item 9.1, issue 9.1.3.

In preparations for WRC-19, working document towards PDN Report ITU-R S.[NGSO FSS 6/4 GHZ SHARING] and ITU-R S.[NGSO\_6/4-GHz] were developed, which provide studies and discussions related to WRC-19 agenda item 9.1, issue 9.1.3.

At the July 2018 meeting of WP4A, draft CPM text (Annex 44 to Document 4A/826) was finalized which includes two studies. One study indicates that circular-orbit non-GSO FSS systems could result in large exceedances of the GSO protection criteria and concludes that it would be very difficult to operate a non-GSO circular-orbit system for the purposes of a global broadband network in the 6/4 GHz frequency bands. A second study offers to establish coordination procedure in the frequency bands 3 700-4 200 MHz and 5 925-6 425 MHz between non-GSO FSS systems under RR No. **9.12**, while keeping the values of the existing limits presented in Article 22 epfd and Article 21 pfd of the Radio Regulations no change.

**2. Preliminary views**

China supports no change (NOC) to the Radio Regulations to satisfy agenda item 9.1, issue 9.1.3 based on study progress of ITU-R for new non-GSO 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 under the terms of Resolution **157 (WRC-15)**.

**Agenda Item 9.1 (issue 9.1.9):**

*Studies related to spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space) (Resolution* ***162 (WRC-15)****);*

**1. Background**

The responsible study group ITU-R WP4A has conducted studies considering additional spectrum needs for development of the fixed-satellite service (FSS), sharing and compatibility studies with existing services, and possible associated regulatory actions invited by Resolution **162 (WRC-15)**.

The draft new Report ITU-R S. [SPECTRUM\_NEEDS] (Document Attachment to WP4A/826) reflects the results of studies of spectrum needs for the FSS and justification of the additional FSS allocation (Earth-to-space) in the 51.4-52.4 GHz band.

The preliminary draft new Report ITU-R S. [SPECTRUM\_SHARING] (Document Annex3 to WP4A/826) reflects the results of sharing and compatibility studies with incumbent services including the fixed service (FS), mobile service (MS) (including potential IMT-2020 applications, Earth exploration-satellite service (EESS) (passive) and radio astronomy service (RAS). The conclusion of sharing and compatibility studies shows that it is feasible for FSS sharing with the FS, MS (including IMT-2020 application) in the same frequency band and compatible with the RAS in the same and adjacent band by corresponding separation distance. And several compatibility studies were also conducted to determine unwanted emission power limits for FSS for the protection of EESS (passive) in the nearby frequency band 52.6-54.25 GHz.

In the draft CPM Report on Agenda item 9.1 (9.1.9) (Document CPM19-2/1), two examples of possible regulatory solutions are shown. In **Example 1**, a new primary allocation would be made to the FSS in the frequency band 51.4‑52.4 GHz (Earth-to-space) limited to FSS gateway links for geostationary orbit use, and relevant regulatory considerations are put forward including modifications to Article 5, Article 21, Appendix 7, and Resolution 750 (Rev.WRC-15) of the Radio Regulations as examples of possible regulatory solutions. **Example 2** is NOC.

**2. Preliminary Views**

China supports ITU-R to further conduct and complete compatibility studies relating to EESS (passive) in the nearby band, and also supports additional spectrum allocation to the FSS (Earth-to-space) in the frequency band 51.4-52.4GHz subject to outcomes of ITU-R studies showing feasibility of sharing and compatibility between the FSS and the existing allocated services.

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