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| **The 5th Meeting of the APT Conference Preparatory**  **Group for WRC-23 (APG23-5)** | **APG23-5/OUT-27** |
| 20 – 25 February 2023, Busan, Republic of Korea | 24 February 2023 |

Working Party 4

**PRELIMINARY VIEWs on WRC-23 agenda item 1.15**

**Agenda Item 1.15:**

*to harmonize the use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service globally, in accordance with Resolution* ***172 (WRC-​19);***

RESOLUTION **172 (WRC-​19*)*** – *Operation of earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service in the frequency band 12.75-13.25 GHz (Earth-to-space).*

**1. Background**

World Radiocommunication Conference 2019 (WRC-19) adopted agenda item 1.15 that calls for studies on the possible operation of earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service in the frequency band 12.75-13.25 GHz (Earth-to-space), in accordance with Resolution **172 (WRC-19)**.

The ITU has addressed aeronautical and maritime earth stations operating with GSO FSS satellites in Study Group 4 and at several WRCs that adopted technical and regulatory regimes to allow such operations. In the Radio Regulations Resolution **902 (WRC-03)** and Resolution **169 (WRC-19)** define technical and regulatory rules to allow GSO FSS networks to communicate with earth stations on aircraft or vessels to provide broadband communications.

WRC-15 adopted Resolution **156 (WRC-15)** allowing the use of ESIM communicating with GSO FSS networks in the 19.7-20.2 GHz and 29.5-30.0 GHz bands and WRC-19 adopted Resolution **169 (WRC-169)** allowing the use of ESIM communicating with GSO FSS networks in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz.

Resolution **172 (WRC-19)** calls for studies to ensure that AP30B allotments and assignments as well as other allocated services are protected.

Working Party (WP) 4A has been designated by CPM23-1 as the responsible group for the Agenda Item 1.15.

Sharing studies are needed in ITU-R to ensure protection of the other primary services in the band such as Fixed-Satellite Service, Fixed Service, and Mobile Service, as well as the protection of Earth exploration-satellite service EESS (active) and aeronautical radionavigation service operating in the adjacent band 13.25-13.4 GHz.

Working Party 4A, in preparation of WRC-23 agenda item 1.15, has consider sharing and compatibility studies and finalize draft CPM text.

For this agenda item, two methods have been identified:

* Method A: This method proposes no changes to the RR and suppression of Resolution **172 (WRC‑19)** due to the existence of various uncertainties in the implementation of several courses of action referred to in the potential Resolution associated with Method B.
* Method B: This method proposes to add a new footnote No. **5.A115** in RR Article **5** an**d a referenc**e to a new WRC Resolution providing the conditions for the operation of ESIM and protection of the services to which the frequency bands are allocated, and consequential suppression of Resolution **172 (WRC‑19)**.

**2. Documents**

* **I**nput Documents:APG23-5-INP-11(THA), INP-17(J), INP-29(IND), INP-35(BGD), INP-39(IRN), INP-44(IRN), INP-48(SNG), INP-50(SNG), INP-55(VTN), INP-59(AUS), INP-66(KOR), INP-70(PNG), INP-81(INS), INP-91(CHN), INP-94(CHN), INP-98(MLA).
* Information Documents: APG23-4/ INF-01(WMO), INF-39(CEPT), INF-43(CITEL), INF-45(RCC).

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

* + 1. **Thailand** - **Document APG23-5/ INP-11**
* Thailand supports Method B in the current draft CPM text, in order to allow the use of frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service, in accordance with Resolution **172 (WRC-19)**.
* Thailand also supports in principle to define responsibilities of the notifying administration related to the operation of earth stations on aircraft and vessels in the frequency band 12.75-13.25 GHz (Earth-to-space) as agreed in ITU-R WP4A and reflected in the current draft CPM text.
* Thailand is of the view that further ITU-R developments of, among other things, the regulatory provisions, appropriate technical conditions and a methodology to examine earth stations on aircraft with respect to the compliance with power flux-density (pfd) masks by the Bureau should ensure protection of the existing services, including their future developments, in the same frequency band and adjacent frequency bands.

**3.1.2 Japan** - **Document APG23-5/INP-17**

* In Japan, the frequency band 12.75–13.25 GHz is allocated to the fixed service, the mobile service, the fixed-satellite service (Earth-to-space), and the space research service (deep space) (space-to-Earth). Those incumbent services are necessary to be protected. Since sharing and compatibility study for earth stations on vessels has not yet been completed, in order to protect the incumbent services, Japan supports further ITU-R studies on the use of earth stations on vessels communicating with GSO space stations in the fixed satellite service.

**3.1.3 India** - **Document APG23-5 / INP-29**

* India supports Method A- No changes to the Radio Regulations and suppression of Resolution 172(WRC-19).

**3.1.4 Bangladesh** - **Document APG23-5/INP-35**

* In order to harmonize the use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service globally, in accordance with Resolution **172 (WRC-​19**), Bangladesh administration prefers method A of the draft CPM report to WRC-2023. However, method B can be supported subject to the protection of existing services in the frequency band 12.75-13.25 GHz (Earth-to-space).
  + 1. **Iran** - **Document APG23-5/INP-39**

This Administration supports method A (NOC) at this point of time.

However, the preliminary views of the Islamic Republic of Iran are as follows:

* In order to make it possible to use the aeronautical and maritime earth stations operating with GSO FSS networks in the 12.75-13.25 GHz band (Earth-to-space),it is required to continue studies to develop technical/ regulatory solution(s) for all difficulties/concerns that are currently raised in the Draft CPM Text, as well as in IRN’S potential contribution to CPM23-2. Completion of studies shall ensure the full protection of the existing and planned radiocommunication services in the 12.75-13.25 GHz band and adjacent bands, in particular, Appendix **30B** as a worldwide Plan.This is important that ESIMs shall not cause unacceptable interference / nor claim protection from existing and planned radiocommunication services (including terrestrial services) in the 12.75-13.25 GHz band and adjacent bands. With respect to other space services, it shall operate within the envelope of technical characteristics and the envelope of coordination agreement.
* The use of the frequency band 12.75-13.25 GHz (Earth-to-space) by A-ESIM and M-ESIM shall not limit the access of other administrations to their national resources in Appendix **30B**. Moreover, Appendix **30B** criteria including service area provisions shall have complied.

A review by the BR of the service area of the Appendix **30B** assignments recorded in the Master International Frequency Register (MIFR) showed that generally the service areas of RR Appendix **30B** networks applied Article 6 and recorded in the List or MIFR are non-contiguous and the number of countries in these service areas ranges from one to fifty countries. Additionally, § 6.16 of RR Appendix **30B** provides that an administration may at any time exclude its territory from the service area of an AP**30B** assignment. Therefore, A-ESIM and M-ESIMs in the 12.75‑13.25 GHz band subject to this agenda item need to have the capability to restrict operations in territories of those administrations the agreement of which under §6.6 has been obtained and authorization for A-ESIM and M-ESIM operations has been granted. Also, distinctive and specific aspects of RR AP**30B** including but not limited to Reference situations for all Plan allotments and assignments in the List.

* Use of A-ESIMs and M-ESIMs shall not cause any interference to allotments, converted to assignments within the limits of initial characteristics as contained in the allotment Plan, and those stemming from the application of Article 7 request transferred to Article 6 of Appendix **30B** as well as those submitted under Resolution 170 (WRC-19),together with all existing and planned services in that frequency band and adjacent bands operating in accordance with the Radio Regulations. A-ESIMs and M-ESIMs shall not claim protection from the allotment Plan, assignments in the List of Appendix **30B** for national coverage, and other services including terrestrial services to which the frequency band is allocated and operating in accordance with the provisions of Radio Regulations.
* To this effect, the notifying administration of A ESIM and M ESIM when submitting Appendix 4 data elements to the Bureau shall also send a firm commitment undertaking that in case of any interference to Allotment in the Plan, assignments in the List and MIFR shall immediately cease emission or reduce it to the minimum level acceptable to the interfered assignments of administration (s).
* For the operation of A-ESIM and M-ESIM, the technical, operational, and regulatory provisions including responsibilities of administrations and entities responsible for the operation, authorization, and interference management system of these earth stations need to be clearly defined and included in the associated Draft Resolution.
* The only administration that could notify ESIM is the same administration notifying the satellite system with which ESIM communicates. Thus, notification of any frequency assignment for ESIMs shall only be made by one single administration, which will be responsible for resolving potential interferences, operational issues, and monitoring of ESIM to comply with Radio Regulations as well as other tasks mentioned in the associated Resolution. Therefore, the notifying administration of the satellite system is responsible for the compliance of ESIM with all relevant regulatory and administrative provisions including cases of interferences.
* An administration the territory of which is situated inside the service area of a satellite and has provided explicit authorization to receive the service/ to be served by any type of ESIM has no obligation nor any mandate, whatsoever, to be involved directly or indirectly in detection, identification, reporting, resolution of any interference caused by the operation of the ESIM the operation of which was authorized.
* The notifying administration of the GSO satellite network is also responsible for ensuring that ESIMs operate only in the territories under the jurisdiction of any administration/country which:

1. located within the service area of the space station;
2. explicit agreement to that effect was obtained and;
3. the required authorization for operation over its territory was sought and explicitly granted from which explicit authorization has been obtained.

Moreover, it has been emphasized that for the implementation of the Resolution, the notifying administration of the satellite network/ system with which ESIMs communicate shall ensure that ESIMs are designed and operated so as to immediately cease transmission over the territory of any administration/country from which authorization has not been obtained. It has also been indicated that for the implementation of the Resolution, the notifying administration responsible for the operation of aeronautical and maritime ESIMs shall also be responsible to observe and comply with all relevant regulatory and administrative provisions applicable to the operation of the above-mentioned ESIMs as included in this Resolution and those contained in the Radio Regulations.

* Regarding the use of PFD mask in ESIM operation, one possible acceptable way is to provide a PFD mask as guidance to administration intending to authorize the operation of the ESIMs to determine whether or not the interference which may be caused to its terrestrial stations/assignments is acceptable. However, reference was made in the  
  ITU-R studies that compliance with the PFD mask does not release the notifying administration of the A-ESIM with respect to discharging its responsibility that such earth station shall not cause unacceptable interference to nor claim protection from terrestrial stations/ assignments. Reference is also made that an administration authorizing the operation of A-ESIM and M-ESIM in their territories (air space and territorial waters) shall be within the service area of the subject satellite network and authorize the operation of the associated gateway earth station as needed.

The relevant examination shall be done by the Bureau and if the latter is unable to examine, that A-ESIM with respect to conformity with the PFD limits then further action to process the submitted assignment would be postponed pending availability of the methodology to carry out such examination. It is worth reiterating that this administration does not support that under the circumstances that the Bureau is unable to examine the conformity with PFD limit, the Bureau formulate a qualified finding since the latter type of finding was rejected by the previous WRC several years ago.

* Generally, there are still several issues on the operation of ESIMs to be clarified and specified in the Draft New Resolution, such as interference management mechanism and operation mechanism of ESIMs that shall be clearly defined by completing relevant studies.

**3.1.6 Singapore** - **Document APG23-5/INP-48**

Based on the recent development of ITU-R studies under Agenda Item 1.15, Singapore would like to share its preliminary views under this agenda item as follows:

1. Supports Method B to satisfy Agenda Item 1.15 which refers to a new WRC Resolution with technical, operational, and regulatory conditions for the operation of A-ESIM and M-ESIM communicating with GSO space stations in the fixed-satellite service in the frequency band 12.75 – 13.25 GHz (Earth-to-space) while ensuring protection of allocated services inter alia protection of terrestrial services and protection of the non-GSO FSS (Earth-to-space) service.
2. Supports the outcome of compatibility studies between M-ESIM and terrestrial services which indicate the adoption of minimum distance of 133 km from the low water mark as officially recognized by the coastal state to protect terrestrial services from unacceptable interference due to M-ESIM operations.

In addition, Singapore is of the view that the current APT preliminary views under Agenda Item 1.15 need to be updated as per embedded document to be aligned with the recent development of ITU-R studies under Agenda Item 1.15. Please see Section 4 of the embedded document in track changes.

**3.1.7 Viet Nam** - **Document APG23-5/INP-55**

Viet Nam generally supports method B to satisfy agenda item 1.15 which refer to the development of a new WRC Resolution with technical, operational, and regulatory conditions for the operation of A-ESIM and M-ESIM communicating with GSO space stations in the fixed-satellite service in the frequency band 12.75 – 13.25 GHz (Earth-to space) while ensuring protection of existing services in those frequency bands and in adjacent bands in accordance with Resolution **172 (WRC-19).**

Viet Nam is also of the view that

* The operation of such earth stations on aircraft and vessels should not impact the usability of the allotments in the Plan and assignments in the List under Appendix 30B of the Radio Regulations;
* Interference management mechanism to deal with interference occurs from operation of ESIM to other administrations and methodology to enable the Radiocommunication Bureau to examine the conformity with PFD limit as contained in Annexes of draft resolution need to be finalized.

**3.1.8 Australlia** - **Document APG23-5/INP-59**

* Australia supports Method B which refers to the establishment of a new regulatory framework (including technical and operational requirements) that improves the efficiency of use of the 12.75- 13.25 GHz band by facilitating Aeronautical Earth Stations in Motion (A-ESIM) and Maritime Earth Stations in Motion (M-ESIM) to use the frequency bands. The framework for this type of ESIM use must ensure protection of services allocated in the 12.75-13.25 GHz band and should not impact the usability of the allotments in the Plan, and assignments in the List under Appendix **30B** of the Radio Regulations. Australia supports the development of a methodology regarding examination by the Bureau of compliance with PFD limits by A-ESIM for protecting terrestrial services, or of adequate transitional measures should WRC-23 not finalise the methodology.
  + 1. **Korea** - **Document APG23-5/INP-66**

The Republic of Korea has preliminary views as follows:

* The use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels shall not limit the access of other administrations to their national resources in RR Appendix **30B** as well as implementation of Resolution **170 (WRC‑19)**;
* The use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels shall not cause unacceptable interference to nor claim protection from the operation of terrestrial services and their future development. With respect to the sharing and compatibility studies between earth stations on aircraft and vessels and terrestrial services, the protection of terrestrial services shall be ensured under all circumstances and conditions in the various sharing scenario;
* The methodology regarding examination by the Bureau of compliance with PFD limits by A-ESIM should be established to ensure the protection of terrestrial services to which the frequency bands are allocated and operated in accordance with the Radio Regulations;
* The compliance with the relevant technical conditions (such as the PFD mask of A-ESIM and separation distance of M-ESIM) does not release the notifying administration of the ESIM with respect to discharging its responsibility that such earth station shall not cause unacceptable interference to nor claim protection from terrestrial services;
* The only administration that could notify ESIM is the same administration as the one notifying the GSO network to which the ESIM communicate. Thus, notification of any frequency assignment for ESIMs shall only be made by one single administration, which will be responsible for resolving potential interferences, operational issues and monitoring of ESIM to comply with Radio Regulations.

**3.1.10 Papua New Guinea** - **Document APG23-5 / INP-70**

Based on the recent development of ITU-R studies under Agenda Item 1.15, Papua New Guinea would like to share its preliminary views under this agenda item as follows:

1. Supports Method B to satisfy Agenda Item 1.15 which refers to a new WRC Resolution with technical, operational, and regulatory conditions for the operation of A-ESIM and M-ESIM communicating with GSO space stations in the fixed-satellite service in the frequency band 12.75 – 13.25 GHz (Earth-to-space) while ensuring protection of allocated services inter alia protection of terrestrial services.
2. Supports the outcome of the compatibility studies between A-ESIM and terrestrial services which indicate the adoption of pfd mask reflected in Annex-2 of the current draft CPM Report under Agenda Item 1.15 to protect terrestrial services due to A-ESIM operations. Consequentially, APT preliminary views related with the compatibility studies between A-ESIM and terrestrial services need to be updated accordingly.
3. Supports the outcome of the compatibility studies between M-ESIM and terrestrial services which indicate the adoption of minimum distance of 133 km from the low water mark as officially recognized by the coastal state to protect terrestrial services due to M-ESIM operations. Consequentially, APT preliminary views related with the compatibility studies between M-ESIM and terrestrial services need to be updated accordingly.
4. Supports Option 2 in Resolves 2 of the current draft new resolution [A115] which indicating that the frequency assignments recorded in the MIFR under § 6.25 of the Appendix 30B could be used as ESIM supporting assignment.

**3.1.11 Indonesia** - **Document APG23-5/INP-81**

* Indonesia is of the view to support the implementation of ESIMs and to ensure the protection of and not impose undue constraints on existing services and their future development, taking into account allotments in the Plan, assignments in Appendix 30B List and those submitted under Articles 6 and 7 of Appendix 30B as well as under Resolution 170 (WRC-19).
* A-ESIM and M-ESIM shall not claim protection from existing and planned radiocommunication services, including terrestrial services in the 12.75-13.25 GHz and adjacent bands, shall not adversely affects the provision of aeronautical safety-of-life services.
* Furthermore, the require pending technical regulations and mechanisms have to be resolved before the implementation of ESIMs, *inter alia* control and monitoring of ESIMs, interference management procedures, authorization of ESIMs when passing through the territory of a country.

**3.1.12 China** - **Document APG23-5/INP-91**

In APG23-4 meeting, APT Members considered the possibility to support Method B of agenda item 1.15 in the draft CPM text. Based on the Draft CPM Report, the Administration of China is of the preliminary view that:

* Allotments in the Plan, conversion of an allotment into an assignment without modification or with a modification which is within the envelope characteristics of the initial allotment, Article 7 request transferred to Article 6, and submission in accordance with Resolution **170** (**WRC-19**) shall be protected by Appendix **30B** ESIM assignments, while the compatibility with other existing services and their future development are met. Based on these draft provisions and APG23-5 further considerations of the concerned elements under the Method B in the draft CPM Report, APT Preliminary Views to support Method B could be formed.

In order to make the words clear and reflect the updated WP 4A study results, this Administration also proposes to update two bullets of APT Preliminary Views reached in APG23-4 meeting with track changes as follows:

* The relevant examination shall be done by the Bureau and if the Bureau is unable to examine that A-ESIM with respect to conformity with the PFD limits on the Earth’s surface specified in the Draft CPM Report, the notifying administration of the A-ESIM shall send to the Bureau a commitment that the A-ESIM will comply with those limits; for this purpose it should be mentioned in the draft CPM Report that the Bureau shall formulate a qualified favourable finding with respect to the limits, otherwise it shall formulate an unfavourable finding.
  + 1. **Malaysia** - **Document APG23-5/INP-98**

Malaysia supports the development of regulatory framework and technical requirements for the operation of earth stations on aircraft and vessels communicating with GSO space stations in the FSS in the frequency band 12.75‐13.25 GHz (Earth‐to‐space) under **Method B**, while:

* ensuring protection of services currently allocated in the same and adjacent frequency bands;
* taking into account the provisions of RR Appendix **30B**; and
* ensuring no changes or restrictions to the allotment in the Plan, assignments in the List of RR Appendix **30B**, and those recorded in the Master International Frequency Register (MIFR) including the assignments arising from the implementation of Resolution **170 (WRC-19)**.

**3.2 Summary of issues raised during the meeting**

Some APT members support Option 2 in *Resolves* 2 of the current draft new resolution [A115] which indicating that the frequency assignments recorded in the MIFR under § 6.25 of the Appendix **30B** could be used as ESIM supporting assignment.

Some APT members are of the view that the relevant examination shall be done by the Bureau and if the Bureau is unable to examine, that A-ESIM with respect to conformity with the PFD limits on the Earth’s surface specified in the Draft CPM Report to comply with the limit, then the notifying administration of the A-ESIM shall send to BR a commitment that the A-ESIM will comply with those limits. For this purpose it should be mentioned in the draft CPM Report that the BR shall formulate a qualified favourable finding with respect to the limits, otherwise the Bureau shall formulate an unfavourable finding and return the notice back to the notifying administration.

**4. APT Preliminary View(s)**

APT members could support Method B provided that the remaining elements and part of that method as referred to draft CPM Report of agenda item 1.15 are finalized and agreed. This includes the following:

* Interference management mechanism to deal with interference occurs from operation of ESIM to other administrations;
* Switching facility allowing transmission over these territories of countries which agreed to be included in the service area and/or authorized operation of the service on the territory under jurisdiction and no transmission over these countries if they are not in the service areas or they have not given their authorization for operation of that ESIM;
* Methodology to enable the Radiocommunication Bureau to examine the conformity with PFD limit as contained in Annexes of draft resolution;
* Other elements, if identified by CPM23-2 to be discussed at the next meeting.

APT Members also have preliminary views as follows:

* The use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels shall not limit the access of other administrations to their national resources in Appendix **30B** as well as implementation of Resolution **170 (WRC‑19)**.
* The use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels shall not cause unacceptable interference to nor claim protection from the operation of terrestrial services and their future development. With respect to the sharing and compatibility studies between earth stations on aircraft and vessels and terrestrial services, the protection of terrestrial services shall be ensured under all circumstances and conditions in the various sharing scenario.
* The implementation of ESIM shall ensure the protection of and shall not adversely affect the existing services and their future development, taking in to account allotments in the Plan, assignments in Appendix **30B** List and those submitted under Articles 6 and 7 of Appendix **30B** as well as under Resolution **170 (WRC-19)**.
* Supports the development of a methodology regarding examination by the Bureau of compliance with PFD limits by A-ESIM, or of adequate transitional measures should WRC‐23 not finalize the methodology.
* The use of earth stations on board aircraft and vessels shall not cause unacceptable interference (more than what is stipulated in relevant annexes to **AP30B** of the Radio Regulations) to allotments, assignments converted from allotments within the limits of initial characteristics as contained in Plan or modified characteristics, for providing services to national territory as well as those from application of Article 6 and 7 of **AP30B** and those submitted under Resolution **170 (WRC-19)** as well as all existing and planned services in that frequency band and adjacent bands operating in accordance with the Radio Regulations.
* Earth stations on board aircraft and vessels shall not claim protection from the allotment plan, assignments in the List of **AP30B** for national coverage, and other services including terrestrial services to which the frequency band is allocated and operating in accordance with the provisions of Radio Regulations.
* With respect to the sharing and compatibility studies between earth stations on board aircraft and vessels communicating with geostationary space stations in the fixed-satellite service and the fixed service in the frequency band 12.75-13.25 GHz, both long-term and short-term interference scenarios under relevant ITU-R Recommendations should be considered and carried out in these studies.
* For the operation of A-ESIM and M-ESIM, the technical, operational and regulatory provisions including responsibilities of administrations and entities responsible for the operation, authorization and the interference management system of these earth stations need to be clearly defined.
* The only administration that could notify ESIM is the same administration as the one notifying the GSO network to which the ESIM communicate. Thus, notification of any frequency assignment for ESIMs shall only be made by one single administration, which will be responsible for resolving potential interference, operational issues and monitoring of ESIM to comply with the Radio Regulations as well as other tasks mentioned in the associated Resolution. Therefore, the notifying administration of the satellite system is responsible for the compliance of ESIM with all relevant regulatory and administrative provisions including cases of interferences.
* An administration the territory of which is situated inside the service area of a satellite and has provided explicit authorization to receive the service/ to be served by any type of ESIM, unless that administration has formally and explicitly agreed to collaborate within its technical ability and possibility to provide assistance, has no obligation nor any mandate, whatsoever, to be involved directly or indirectly in detection, identification, reporting, resolution of any interference caused by the operation of the ESIM the operation of which was authorized.
* The notifying administration of the GSO satellite network is also responsible for ensuring that ESIMs operate only in the territories under the jurisdiction of any administration/country which:
* located within the service area of the space station;
* explicit agreement to that effect was obtained and;
* the required authorization for operation over its territory was sought and explicitly granted from which explicit authorization has been obtained.
* A-ESIM and M-ESIMs in the 12.75‑13.25 GHz band need to have the capability to restrict operations in territories of those administrations the agreement of which under §6.6 of Appendix **30B** has been obtained and authorization for A-ESIM and M-ESIM operations has been granted.
* Regarding the use of PFD mask in A-ESIM operation, it is an acceptable way to provide a PFD mask as guidance to administration intending to authorize the operation of the A-ESIMs to determine whether or not the interference which may be caused to its terrestrial stations/assignments are acceptable.
* The notifying administration of A-ESIM and M-ESIM when submitting Appendix **4** data elements to the Bureau shall also send a firm commitment undertaking that in case of any interference to Allotment in the Plan, assignments in the List and MIFR shall immediately cease emission or reduce it to the minimum level acceptable to the interfered assignments of administration (s).
* The compliance with the relevant technical conditions (such as the PFD mask of A-ESIM and separation distance of M-ESIM) does not release the notifying administration of the ESIM with respect to discharging its responsibility that such earth station shall not cause unacceptable interference to nor claim protection from terrestrial stations/ assignments.
* An administration authorizing the operation of A-ESIM and M-ESIM in their territories (air space and territorial waters) shall be within the service area of the subject satellite network and authorize the operation of the associated gateway earth station as needed.
* Any transmissions from M-ESIM within the minimum distance, as specified in the Resolution for this agenda item, in order to protect terrestrial services shall be subject to prior agreement of the concerned administration.
* For M-ESIM with respect to the terrestrial service, both long-term and short-term interference scenarios should be considered, in which [133 or X] km should be treated as the minimum distance for M-ESIM sharing and compatibility with FS from the low-water mark as officially recognized by the coastal State.
* There are still several issues on the operation of ESIMs to be clarified and specified in the Draft New Resolution, such as interference management mechanism and its due functionality. Moreover, the proper function of switching facility to respond to authorization provided for the operation of ESIM as well as exclusion of territory of countries that did not agree with operation.

\* X: The minimum distance ranges from 86 – 190 km as the current result of ITU-R WP4A studies.

**5. Other View(s) from APT Members**

Some APT Members are of the view that for sharing and compatibility of ESIM with non-GSO FSS satellite systems, there is no need to set up specific additional RR provisions.

**6. Issues for Consideration at Next APG Meeting**

APT Members are invited to follow the conclusion of CPM with the view to provide further clarification on this agenda item.

**7. Views from Other Organisations**

**7.1 Regional Groups**

**7.1.1 ASMG - Document APG23-4/ INF-21**

* Follow-up studies related to the regulatory and technical aspects of earth stations in motion on aircraft and vessels which communicate with GSO space stations in the fixed-satellite service operating in the frequency band 12.75-13.25 GHz (Earth-to-space) with a view to establish clear and simple procedures so that administrations can ensure the protection of their existing services, while ensuring no limitation would be applied on the allotments and assignments in the Plan (Appendix 30B). Thus, that it does not limit administrations' access to their national resources in Appendix 30B in accordance with Resolution 170 (WRC-19).
* Develop a methodology to assist the Radiocommunication Bureau in examination the conformity of earth stations on aircraft and vessels in case an appropriate flux-density value is agreed to protect terrestrial services from earth stations in motion. The methodology should be developed and agreed prior to the conference.
* Define the role of the Network Control and Monitoring Center (NCMC), while emphasizing that the notifying administration of the satellite network holds the responsibility for operating the mobile earth stations on board aircraft and vessel to resolve any interference incident. In that regard, the administrations issue operating licenses for these stations to provide services in their territories should not be responsible for resolving interference incidents.
* The administrations responsible for the use of the Appendix 30B assignment in the List to operate earth stations on aircraft and vessels in the frequency band 12.75-13.25 GHz shall obtain the explicit agreement from all administrations affected as a result of such use.
* Strict minimum separation distance and EIRP values for earth stations on vessels shall be chosen. As well as strict pfd masks for earth stations on board aircraft to ensure protection of existing terrestrial services.
* Emphasis that the downlink of mobile earth stations in the frequency bands 10.7-10.95 GHz and 11.2 - 11.45 GHz shall not claim protection from terrestrial services that have allocations in those frequency bands and operate in accordance with the Radio Regulations. Moreover, the allotments and assignments in Plan (Appendix 30B) shall not adversely affected.
* The frequency assignments of mobile earth stations shall be notified by the administration responsible of the satellite network to the Radiocommunication Bureau.

**7.1.2 ATU** - **Document APG23-4/INF-02**

*Part 1: Common position:*

* **Support** the studies on the regulatory and technical aspects for ESIMs on aircraft and vessels communicating with GSO space stations in the FSS operating in the frequency band 12.75-13.25 GHz (Earth-to-space), while ensuring protection to the existing services and those in the adjacent bands within the frequency band 13.25−13.75 GHz, taking into account the need to protect Appendix 30B.
* **Decide** that studies under this agenda item need to equally consider the effect of aggregated interference from ESIMs to ensure long term protection of Fixed and Mobile Service.
* **Decide** that the operation of such earth stations on aircraft and vessels should not impact the usability of the allotments in the Plan and assignments in the List under Appendix 30B of the Radio Regulations and not limit the access of other administrations to their national resources in Appendix 30B as well as implementation of Resolution 170 (WRC 19).
* **Develop** a methodology for the BR to examine the conformity of earth stations on aircraft and vessels in case of usage of an appropriate pfd to protect terrestrial services from ESIM with such methodology needs to be established and agreed upon.
* **Decide** that Aeronautical or maritime earth stations in the 12.75 - 13.25 GHz band need to have the capability to restrict operations in territories of those administrations where agreement under No. 6.6 has been obtained and authorization for such operations has been granted.
* **Decide** that, there is need to establish regulatory, technical and recording procedures for the usage of these type of Earth Stations in Motion (ESIMs) that may differ than the current FSS Appendix 30B Plan and list recording procedures. Any cost arising from potential implementation of Resolution 172 as well as its updates at WRC-23 need to be carefully examined and decided upon.
* **Seek** to ensure that the use of ESIMs with satellite networks that have a global coverage in Appendix 30B do not create an obstacle for deployment of national or sub-regional satellite networks of other countries in RR Appendix 30B in accordance with Topic F under AI 7 which are initiated from Multi-African administration proposal.
* **Support** that any AI under consideration of WRC-23 shall ensure that the protection of RR Appendix**30B** is guaranteed.
* **Support** that the administrations responsible for notice to use an Appendix 30B assignment in the List in support of the operation of earth stations on aircraft and vessels in the frequency band 12.75-13.25 GHz, to seek the explicit agreement of all the affected administrations from such use.

*Part 2: Way forward*

***Request ATU administrations to:***

* **Follow-up** the studies between earth stations on aircraft and vessels communicating with GSO space stations in the FSS and current and planned stations of existing as well as services in adjacent frequency bands, to ensure protection of, and in no way adversely affect these services and their future development, considering the provisions of Appendix 30B in accordance with Resolution 172 (WRC-19).
* **Follow-up** the regulatory and technical aspects of operations of earth stations on aircraft and vessels communicating with GSO space stations in service area under the jurisdiction of any country Member State of the ITU.
* **Assess** the spectrum utilization in the frequency band 12.75 – 13.25 GHz within their country.
* **Contribute** to and actively participate in work of ITU-R WP4A, in order to have ATU views addressed in the Agenda item.

**7.1.3 CEPT - Document APG23-5/INF-39**

* CEPT supports establishing a regulatory framework and technical requirements for operation of earth stations on aircraft and vessels in the frequency band 12.75-13.25 GHz (Earth-to-space) with conditions that protect the services currently allocated in this frequency band and bands adjacent to it, taking into account ECC Decision (19)04.
* CEPT considers that earth stations on aircraft and vessels in the frequency band 12.75-13.25 GHz shall operate consistent with the Appendix 30B procedures, protect the Appendix 30B allotments in the Plan, assignments in the List and in the new proposed Appendix 30B ESIM List (if adopted at WRC-23) and respect Resolution 170 (WRC-19).
* CEPT supports the operation of these earth stations in the territories (air space and territorial waters) of administrations which have given agreement under No. 6.6 of Article 6 of Appendix 30B and have authorised such operation within their territories. The characteristics of these earth stations should remain in the envelope of notified earth station characteristics.
* CEPT supports the application of on-axis (depending on the maximum antenna gain) and off-axis e.i.r.p. density limits for the purpose of the protection of non-GSO FSS systems.
* CEPT supports the use of power flux density (PFD) limits on the earth surface for earth stations on aircraft to ensure the protection of Mobile and Fixed Services, and also supports the development of a methodology to verify compliance with PFD limits by GSO earth stations on aircraft or of adequate transitional measures in case WRC-23 could not finalise the methodology.
* CEPT is of the view that the notifying administration of the GSO network with which the earth stations on aircraft and vessels communicate should be identifiable to address the potential cases of harmful interference caused by any earth station on aircraft and vessels to fixed and mobile services. This identification could be done thanks to: i) the license issued by / authorization of the administration for the operation of the earth station on aircraft and vessels on its territory; ii) the assistance of the flag nation of aircraft/vessel; iii) the on-board radio license of the aircraft or vessel equipped with an earth station.
* CEPT is of the view that the receiving part of these earth stations in the associated frequency bands shall not claim protection from terrestrial services having allocations in the same frequency bands and operating in accordance with the Radio Regulations.

**7.1.4 CITEL - APG23-5/INF-43**

* Some Administrations propose to add a new footnote, 5.A115, in RR Article 5, frequency band 12.75-13.25 GHz (Earth-to-space), pointing to a new Resolution that provides the conditions for the operation of earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service in these bands. With regards the protection of nongeostationary systems in the FSS, these administrations propose to employ the operational limits defined in Annex 3 to Draft New Resolution for Method B of draft CPM text for WRC-23 Agenda Item 1.15.

**7.1.5 RCC - Document APG23-5/INF-45**

* Support development of regulatory provisions and technical requirements for ESIMs on aircraft and vessels in GSO FSS in the bands 13 GHz (E-to-s). Еarth stations on aircraft and vessels communicating with a GSO FSS space station could be used only if the following conditions are met:

• ESIMs on aircraft and vessels in the frequency band 12.75-13.25 GHz (E-to-s) shall  
operate within the envelope of the ES’s characteristics notified in the satellite network as well as comply with agreements reached under §§ 6.5, 6.6 and 6.16 of Article 6 RR  
Appendix 30B.  
• Use of ESIM on aircraft and vessels in the frequency band 12.75-13.25 GHz (E-to-s) shall be within the frequency assignments to satellite networks submitted and recorded in the MIFR in accordance with Articles 6 and 8 of RR Appendix 30B.  
• Administrations planning to use ESIMs on aircraft and vessels in the frequency band  
12.75-13.25 GHz (E-to-s) in international waters or international airspace shall send to the Bureau information on such ESIMs. Such filings shall be considered as new submissions of frequency assignments to satellite networks with a new date of receipt and they are subject to examination by the BR for the protection of the RR Appendix 30B Plan and List frequency allotments/assignments against interference, taking into consideration the worst location of test points outside the land and space above it.  
RCC administrations tend to Method B from the draft CPM Report.

**7.2 International Organisations**

**7.2.1 WMO** - **Document APG23-5/INF-01**

* WMO supports the protection of EESS (active) in the band 13.25-13.75 GHz and concurs with the ITU-R conclusion that interference from Earth stations on aircraft and vessels in the band 12.75-13.25 GHz is not an issue and that no additional regulatory provisions are required.

**7.2.2 ICAO** - **Document APG23-3/INF-15**

* To ensure that any radio regulatory action, taken as a result of this agenda item, neither adversely affects the provision of aeronautical safety-of-life services nor sets an unwanted precedent.

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