

**Hong Kong's Positions on Agenda Items for  
World Radiocommunication Conference 2023**

**Purpose**

This paper covers Hong Kong's positions on the relevant agenda items ("AIs") of the World Radiocommunication Conference 2023 ("WRC-23") of the International Telecommunication Union ("ITU"), which will be held in Dubai, the United Arab Emirates, from 20 November to 15 December 2023.

**Background**

2. At the 27<sup>th</sup> meeting of the Radio Spectrum and Technical Standards Advisory Committee ("SSAC") held on 22 December 2022, the Office of the Communications Authority ("OFCA") presented SSAC Paper [4/2022](#) giving a brief account on WRC-23 and requested for Members' comments on the AIs. In January 2023, OFCA received from Members their preliminary views on the relevant AIs.

3. OFCA attended the 5<sup>th</sup> meeting of the Asia Pacific Telecommunity ("APT") Conference Preparatory Group for WRC-23 ("APG23-5") and the 2<sup>nd</sup> session of the Conference Preparatory Meeting for WRC-23 ("CPM23-2") in February and April 2023 respectively in order to monitor the relevant development. Same as other regional organisations, APT has been working with its members to develop APT's preliminary views on various AIs. As for CPM23-2, a report of the Conference Preparatory Meeting ("CPM Report") summarising relevant matters, considerations and proposed methods to satisfy the respective AIs was finalised and published by ITU in May 2023.

4. OFCA has recently sought comments of concerned government departments, i.e. Civil Aviation Department ("CAD"), Hong Kong

Observatory (“HKO”) and Marine Department (“MD”), on the relevant AIs. Their comments are summarised as follows:

- a) CAD has no comment on any specific AIs and in general supports the positions of the International Civil Aviation Organisation;
- b) HKO basically supports the positions of the World Meteorological Organisation on related AIs, in particular the importance of protecting meteorological radar measurements via application of appropriate regulatory provisions for high altitude platform stations as International Mobile Telecommunications base stations (“HIBS”) operating in the 2500 – 2690 MHz band under AI 1.4; and
- c) MD has no comment on specific AIs but just reminding the importance of protecting the frequency bands currently assigned to MD or used for maritime radio communication services.

### **Hong Kong’s Positions**

5. Taking into account the views received from Members and the concerned government departments on the relevant AIs, APT’s preliminary views and the CPM Report, OFCA sets out at **Annex** to this paper Hong Kong’s positions on the AIs.

6. In March 2023, OFCA held a video conference with the Ministry of Industry and Information Technology (“MIIT”) of China to exchange preliminary views on certain AIs. OFCA will continue exchanging views with MIIT on the relevant AIs and will join the Chinese delegation to attend WRC-23. In the meantime, OFCA will attend the 6<sup>th</sup> meeting of the APT Conference Preparatory Group for WRC-23 to be held in Brisbane, Australia in August 2023 to continue monitoring the relevant discussions and grasp APT’s positions on various AIs identified in relevant APT common proposals.

### **Advices Sought**

7. Members are invited to give their views on Hong Kong’s

positions on the relevant AIs.

**Office of the Communications Authority  
June 2023**

## AI 1.1

*to consider, based on the results of the studies conducted by the Radiocommunication Sector of ITU (“ITU-R”), possible measures to address, in the frequency band 4800 – 4990 MHz (“4.9 GHz”), protection of stations of the aeronautical and maritime mobile services (“AMS/MMS stations”) located in international airspace and waters from other stations located within national territories and to review the power flux-density (“pfd”) criteria in No. 5.441B in accordance with Resolution 223 (Rev.WRC-19)<sup>1</sup>*

**Key Points and Methods to Satisfy this Agenda Item**

AI 1.1 covers the technical and regulatory conditions for the protection of AMS/MMS stations located in international airspace and waters from other stations (including International Mobile Telecommunications (“IMT”) stations operating in the 4.9 GHz band<sup>2</sup>) located within administrations’ territories.

Six Methods<sup>3</sup>, including no change (“NOC”) to the Radio Regulations (“RR”), are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	NOC except for modification of Resolution <b>223 (Rev.WRC-19)</b> to apply the existing pfd value to all countries listed in RR No. <b>5.441B</b>
<b>Method C</b>	Modification of the existing pfd criterion in RR No. <b>5.441B</b>
<b>Method D</b>	Modification of the existing pfd criterion in RR No. <b>5.441B</b> and applying it to all countries listed in RR No. <b>5.441B</b>
<b>Method E</b>	Application of a pfd criterion and extension of list of countries where it is not applied through separate regulatory measures
<b>Method F</b>	Application of RR No. <b>9.21</b> and bilateral/multilateral coordination agreements with coastal States for the protection of AMS/MMS stations in international airspace and waters

<sup>1</sup> Resolution **223 (Rev.WRC-19)**: Additional frequency bands identified for International Mobile Telecommunications

<sup>2</sup> The 4800 – 4990 MHz band is globally allocated to, among others, mobile service (including aeronautical and maritime mobile services) on a co-primary basis.

<sup>3</sup> “Method” is the term of ITU for proposals of resolving an agenda item. The proposal may cover technical, regulatory, operational and/or procedural approaches, to satisfy a WRC agenda item.

### Consideration

In APG23-5 and CPM23-2, China expressed its preliminary view on AI 1.1 that AMS/MMS stations operating in the 4.9 GHz band and located in international airspace and waters should not claim protection from IMT stations located within national territories to avoid adversely affecting the IMT stations already in operation. China therefore supported Method F and opposed Methods B and D, under which pfd criteria were proposed to be applied to all countries listed in RR No. **5.441B** and hence to remove the existing exemption from applying the pfd criteria to administrations listed in Resolution **223 (Rev.WRC-19)**, including China.

In Hong Kong, the 4800 – 4960 MHz band has already been assigned to mobile network operators<sup>4</sup> for provision of the fifth generation mobile (“5G”) services. Since China (including Hong Kong) is, among other administrations, exempted from the application of pfd criteria in RR No. **5.441B** in respect of the use of the 4.9 GHz band for IMT, the deployment of mobile base stations operating in the 4800 – 4960 MHz band in Hong Kong might be affected if this exemption is removed.

### Hong Kong’s Position

Hong Kong shares the aforementioned preliminary view of China, i.e. supports Method F and opposes Methods B and D.

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<sup>4</sup> The frequency bands, 4800 – 4840 MHz and 4920 – 4960 MHz, were assigned to China Mobile Hong Kong Company Limited (“CMHK”) and SmarTone Mobile Communications Limited respectively in November 2021 (see [https://www.ofca.gov.hk/filemanager/ofca/en/content\\_1517/SuccessfulBidderNotice\\_20211126.pdf](https://www.ofca.gov.hk/filemanager/ofca/en/content_1517/SuccessfulBidderNotice_20211126.pdf)) while the frequency bands, 4840 – 4880 MHz and 4880 – 4920 MHz, were assigned to CMHK and Hong Kong Telecommunications (HKT) Limited respectively in November 2019 (see [https://www.ofca.gov.hk/filemanager/ofca/en/content\\_1169/4\\_9\\_ghz\\_Auction\\_SuccessfulBidderNotice20191129.pdf](https://www.ofca.gov.hk/filemanager/ofca/en/content_1169/4_9_ghz_Auction_SuccessfulBidderNotice20191129.pdf)).

## AI 1.2

*to consider identification of the frequency bands 3300 – 3400 MHz, 3600 – 3800 MHz, 6425 – 7025 MHz, 7025 – 7125 MHz and 10.0 – 10.5 GHz for IMT, including possible additional allocations to the mobile service (“MS”) on a primary basis, in accordance with Resolution 245 (WRC-19)<sup>5</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.2 considers the identification of the following bands for IMT including possible additional allocations to the MS on a primary basis globally or at regional level in accordance with Resolution **245 (WRC-19)**:

- (a) 6.425 – 7.025 GHz (“6 GHz band”) (Region 1, i.e. Europe and Africa);
- (b) 7.025 – 7.125 GHz (“7 GHz band”) (global); and
- (c) 3.3 – 3.4 GHz<sup>6</sup>, 3.6 – 3.8 GHz and 10.0 – 10.5 GHz (Region 2, i.e. America).

Three to six Methods are proposed for each candidate frequency band above in the CPM Report to satisfy this AI as summarised below:

Candidate Bands	Proposed Methods
<b>3.3 – 3.4 GHz (Region 1)</b>	NOC (Method 1A) and five Methods for IMT identification (Methods 1B to 1F)
<b>3.3 – 3.4 GHz (Region 2)</b>	NOC (Method 2A) and two Methods for IMT identification (Methods 2B and 2C)
<b>3.6 – 3.8 GHz (Region 2)</b>	NOC (Method 3A) and five Methods for IMT identification (Methods 3B to 3F)
<b>6.425 – 7.025 GHz (Region 1)</b>	NOC (Method 4A) and four Methods for IMT identification (Methods 4B to 4E)
<b>7.025 – 7.125 GHz (Global)</b>	NOC (Method 5A) and four Methods for IMT identification (Methods 5B to 5E)
<b>10.0 – 10.5 GHz (Region 2)</b>	NOC (Method 6A) and two Methods for IMT identification (Methods 6B and 6C)

<sup>5</sup> Resolution **245 (WRC-19)**: Studies on frequency-related matters for the terrestrial component of International Mobile Telecommunications identification in the frequency bands 3300 - 3400 MHz, 3600 - 3800 MHz, 6425 - 7025 MHz, 7025 - 7125 MHz and 10.0 - 10.5 GHz

<sup>6</sup> In addition to Region 2, identification for IMT use in the 3.3 – 3.4 GHz band is also proposed to be extended to administrations of Region 1 via amendment to the existing relevant footnotes.

## Consideration

### 6 GHz and 7 GHz bands

In Hong Kong, the 6 GHz and 7 GHz bands are allocated to fixed service (“FS”), and partly allocated to fixed-satellite services (“FSS”) (Earth-to-space) (6.425 – 7.075 GHz), and MS (7.075 – 7.125 GHz). Apart from the use of ultra-wideband devices under the Class Licence for Short Range Device<sup>7</sup>, spectrum in the 6 GHz band is currently assigned to fixed links and FSS (Earth-to-space) while spectrum in the 7 GHz band is assigned to fixed links and an outside-broadcast (“OB”) link.

### 3.3 – 3.4 GHz, 3.6 – 3.8 GHz and 10.0 – 10.5 GHz bands

In Hong Kong, we have been using the 3.3 – 3.4 GHz (indoor only) and 3.4 – 3.6 GHz bands for provision of 5G services, and the 3.6 – 3.7 GHz band as the guard band between the public mobile services and FSS. At present, there is no allocation and usage in the 10.0 – 10.15 GHz and 10.3 – 10.45 GHz bands in Hong Kong while the 10.15 – 10.3 GHz band is being used by some government users for their fixed links. For the 10.45 – 10.5 GHz band, amateur/amateur-satellite stations are allowed to be operated under the terms and conditions stipulated in the Amateur Station Licence.

## Hong Kong’s Position

We support the identification of the 7 GHz band for IMT globally and the identification of the 6 GHz band for IMT, if possible, in Hong Kong because these two bands could facilitate the development of 5G in Hong Kong.

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<sup>7</sup> [https://www.coms-auth.hk/filemanager/common/licensing/SRD\\_Class\\_Licence\\_\(Eng\).pdf](https://www.coms-auth.hk/filemanager/common/licensing/SRD_Class_Licence_(Eng).pdf)

### AI 1.3

*to consider primary allocation of the frequency band 3600 – 3800 MHz to the MS in Region 1 and take appropriate regulatory actions, in accordance with Resolution 246 (WRC-19)<sup>8</sup>*

#### Key Points and Methods to Satisfy this Agenda Item

AI 1.3 considers primary allocation of the frequency band 3600 – 3800 MHz to the MS in Region 1.

Five Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Upgrade the allocation of the frequency band 3600 – 3800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1 without conditions
<b>Method C</b>	Upgrade of the allocation to the mobile, except aeronautical mobile, service on a primary basis within Region 1 with regulatory and/or technical conditions
<b>Method D</b>	Upgrade of the allocation of the frequency band 3600 – 3800 MHz to the MS on a primary basis within Region 1 without conditions, and identification for IMT
<b>Method E</b>	Upgrade of the allocation of the frequency band 3600 – 3800 MHz or parts thereof to the mobile, except aeronautical mobile, service on a primary basis in Region 1 with regulatory and/or technical conditions, and identification for IMT

#### Consideration

This AI covers spectrum use in Region 1 rather than Region 3 (where Hong Kong is located).

#### Hong Kong's Position

Neutral.

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<sup>8</sup> Resolution 246 (WRC-19): Studies to consider possible allocation of the frequency band 3600 – 3800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1



## AI 1.4

*to consider, in accordance with Resolution 247 (WRC-19)<sup>9</sup>, the use of high-altitude platform stations as IMT base stations (“HIBS”)<sup>10</sup> in the MS in certain frequency bands below 2.7 GHz already identified for IMT, on a global or regional level*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.4 covers the use of HIBS in the MS in six frequency bands below 2.7 GHz identified for IMT, on a global or regional level including the sharing and compatibility studies and modifications to the RR. The frequency bands were grouped into four issues as shown below:

- Issue A: 694 – 960 MHz;
- Issue B: 1710 – 1885 MHz;
- Issue C: 1885 – 1980 MHz, 2010 – 2025 MHz, 2110 – 2170 MHz; and
- Issue D: 2500 – 2690 MHz.

Three to four Methods are proposed for each Issue above in the CPM Report to satisfy this AI as summarised below:

Frequency Band (Issue)	Method			
	NOC	Use by HIBS globally	Use by HIBS without claiming protection	Use by HIBS per Region
<b>A</b>	A1	A2	A3	A4
<b>B</b>	B1	B2	B3	B4
<b>C</b>	C1	C2	C3	-
<b>D</b>	D1	D2	D3	D4

### Consideration

In Hong Kong, the aforementioned frequency bands, except the 2010 – 2025 MHz band which is currently vacant, have been assigned for, among others, government use, public mobile service, trunked mobile radio systems and telecommunications apparatus. Similar to high-altitude platform station, HIBS which is designed mainly for wireless

<sup>9</sup> Resolution 247 (WRC-19): Facilitating mobile connectivity in certain frequency bands below 2.7 GHz using high-altitude platform stations as International Mobile Telecommunications base stations

<sup>10</sup> HIBS are located in the stratosphere, providing both uplink and downlink mobile connectivity to the ground-based user equipment. HIBS are intended to be used as part of terrestrial IMT networks, as an application of the mobile service, and may use the same frequency bands with ground-based IMT base stations. The user equipment to be served by HIBS is proposed to be the same as that served by the ground-based IMT base stations. Currently, the user equipment supports a variety of frequency bands identified for IMT, including frequency bands below 2.7 GHz.

broadband/mobile coverage in remote areas is unlikely to be deployed in Hong Kong. If the Mainland is to deploy HIBS in future, there is an established frequency coordination mechanism between Hong Kong and the Mainland to resolve potential interference problems associated with such use.

#### Hong Kong's Position

Hong Kong supports the identification of additional bands and the appropriate technical constraints to facilitate the development of global broadband/mobile applications through HIBS while ensuring adequate protection of the existing services operating in the frequency bands concerned.

## AI 1.5

*to review the spectrum use and spectrum needs of existing services in the frequency band 470-960 MHz in Region 1 and consider possible regulatory actions in the frequency band 470-694 MHz in Region 1 on the basis of the review in accordance with Resolution 235 (WRC-15)<sup>11</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.5 addresses the future spectrum use of the frequency band 470 – 694 MHz in Region 1.

Seven Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Primary allocation to the MS in the frequency band 470 – 694 MHz with or without identification to IMT in the frequency band 470 – 694 MHz or parts thereof in Region 1
<b>Method C</b>	Primary allocation to the mobile, except aeronautical mobile, service in the frequency band 470 – 694 MHz and identification to IMT in the frequency band 470 – 694 MHz or parts thereof in Region 1
<b>Method D</b>	Primary allocation to the mobile, except aeronautical mobile, service within the band 470 – 694 MHz without IMT identification in Region 1
<b>Method E</b>	Primary allocation to the mobile, except aeronautical mobile, service of the band 470 – 694 MHz in Region 1 with technical condition limiting MS operations to downlink in this band
<b>Method F</b>	Secondary allocation to the mobile, except aeronautical mobile, service in the band 470 – 694 MHz in Region 1
<b>Method G</b>	Considerations of the radio astronomy service (applicable in conjunction with Methods B to E where the MS is allocated on a primary basis in Region 1)

### Consideration

This AI covers spectrum use in Region 1 rather than Region 3.

### Hong Kong's Position

Neutral.

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<sup>11</sup> Resolution 235 (WRC-15): Review of the spectrum use of the frequency band 470 – 960 MHz in Region 1

## AI 1.6

*to consider, in accordance with Resolution 772 (WRC-19)<sup>12</sup>, regulatory provisions to facilitate radiocommunications for sub-orbital vehicles (“SOV”) <sup>13</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.6 covers the spectrum needs for stations on board SOV, appropriate modification (if any) to the RR, excluding any new allocations or changes to the existing allocations in **Article 5**, and to identify whether there is a need for access to additional spectrum.

Three Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	A new WRC Resolution containing the provisions to operate radiocommunications for SOV
<b>Method C</b>	A Revision to Resolution <b>772 (WRC-19)</b> in order to clarify the list of possible interference scenarios

### Consideration

In APG23-5, APT Members preferred Method B and were of the preliminary view that the new Resolution to be developed should, among others, ensure that SOV would not affect the existing civil aviation and space launch systems, and not to impose any additional constraints on other services or applications operating in the same services.

### Hong Kong’s Position

Hong Kong supports development of the appropriate regulatory provisions to facilitate the use of SOV while ensuring protection of existing services operating in the same and adjacent bands.

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<sup>12</sup> Resolution **772 (WRC-19)**: Consideration of regulatory provisions to facilitate the introduction of sub-orbital vehicles

<sup>13</sup> SOV are intended to operate at higher altitudes than conventional aircraft during short periods of time without permanently entering an orbit.

## AI 1.7

*to consider a new aeronautical mobile-satellite (route) service (“AMS(R)S”) allocation in accordance with Resolution 428 (WRC-19)<sup>14</sup> for both the Earth-to-space and space-to-Earth directions of aeronautical VHF communications in all or part of the frequency band 117.975 – 137 MHz, while preventing any undue constraints on existing very high frequency (“VHF”) systems operating in the aeronautical mobile (route) service (“AM(R)S”), in the aeronautical radionavigation service, and in adjacent frequency bands;*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.7 deals with a possible new allocation to the AMS(R)S within the 117.975 – 137 MHz band, to relay standard VHF communications operating under the AM(R)S using standard VHF radios already installed on board aircraft with a view to complementing terrestrial infrastructures over oceanic and remote areas.

Two Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	New allocation to the AMS(R)S within the frequency band 117.975 – 137 MHz

### Consideration

In Hong Kong, the 117.975 – 137 MHz band is allocated to AMS. In APG23-5, APT Members were of the preliminary view that the following issues should be addressed if Method B was to be pursued:

- ensuring protection of the existing services in the same and adjacent bands, including mobile-satellite service (“MSS”), space operation service, meteorological-satellite service and space research service, through an appropriate limit for AMS(R)S unwanted emissions above 137 MHz; and
- limiting to internationally standardized aeronautical systems.

### Hong Kong’s Position

Hong Kong supports the ongoing technical and operational studies conducted by ITU-R while ensuring any new allocation of AMS(R)S would not adversely affect the existing services operating in the same and adjacent bands.

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<sup>14</sup> Resolution 428 (WRC-19): Studies on a possible new allocation to the aeronautical mobile-satellite (R) service within the frequency band 117.975 – 137 MHz in order to support aeronautical VHF communications in the Earth-to-space and space-to-Earth directions

## AI 1.8

*to consider, on the basis of ITU R studies in accordance with Resolution 171 (WRC-19)<sup>15</sup>, appropriate regulatory actions, with a view to reviewing and, if necessary, revising Resolution 155 (Rev.WRC-19)<sup>16</sup> and No. 5.484B to accommodate the use of FSS networks by control and non-payload communications (“CNPC”) of unmanned aircraft systems (“UAS”)*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.8 proposes a review and potential revision of Resolution **155 (Rev.WRC-19)** and RR No. **5.484B** in order to accommodate the use of FSS networks by CNPC of UAS.

Two Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	Suppression of RR No. <b>5.484B</b> together with Resolution <b>155 (Rev.WRC-19)</b> and Resolution <b>171 (WRC-19)</b> considering that no satisfactory solution can be identified for the operation of UAS earth stations
<b>Method B</b>	Revision of Resolution <b>155 (Rev.WRC-19)</b> and suppression of Resolution <b>171 (WRC-19)</b> with revision of RR No. <b>5.484B</b> as an option

### Consideration

In APG23-5 and CPM23-2, there were diverse views on protecting the operation of UAS against interference caused by existing terrestrial and space services, and great concerns expressed on the responsibilities of administrations under the RR on the protection of the CNPC links from the safety perspectives. APT Members were of the preliminary view that the relevant issues should be addressed if Method B was to be pursued.

### Hong Kong’s Position

Hong Kong supports ITU-R’s studies to develop relevant technical and regulatory provisions to address the safety-of-life issues related to the UAS CNPC operations and resolve the responsibilities among the administrations properly.

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<sup>15</sup> Resolution **171 (WRC-19)**: Review and possible revision of Resolution **155 (Rev.WRC-19)** and No. 5.484B in the frequency bands to which they apply

<sup>16</sup> Resolution **155 (Rev. WRC-19)**: Regulatory provisions related to earth stations on board unmanned aircraft which operate with geostationary-satellite networks in the fixed-satellite service in certain frequency bands not subject to a Plan of Appendices 30, 30A and 30B for the control and non-payload communications of unmanned aircraft systems in non-segregated airspaces

## AI 1.9

*to review Appendix 27 of the RR and consider appropriate regulatory actions and updates based on ITU-R studies, in order to accommodate digital technologies for commercial aviation safety-of-life applications in existing high frequency (“HF”) bands allocated to the AM(R)S and ensure coexistence of current HF systems alongside modernized HF systems, in accordance with Resolution 429 (WRC-19)<sup>17</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.9 reviews the “Frequency Allotment Plan for the Aeronautical Mobile (Route) Service and Related Information” (i.e. Appendix 27 of the RR) and considers appropriate regulatory actions and updates based on ITU-R’s studies in order to accommodate digital technologies for commercial aviation safety-of-life applications in existing HF bands allocated to the AM(R)S and ensure coexistence of current HF systems alongside modernized HF systems.

Two Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Inclusion into RR Appendix 27, the relevant part of the Rules of Procedure, and explicit recognition of the aggregation of single channels for wideband digital communications

### Consideration

In APG23-5, APT Members were of the preliminary view that modifications to the RR to accommodate digital technologies for aeronautical wideband HF systems (i.e. Method B) could be supported provided that compliance with safety requirements and protection of other primary services in the same and adjacent bands, in particular, existing AM(R)S HF systems, could be ensured.

### Hong Kong’s Position

Hong Kong supports digitalization of the aviation safety-of-life applications operating in the HF band while ensuring the protection of existing services in the same and adjacent bands.

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<sup>17</sup> Resolution 429 (WRC-19): Consideration of regulatory provisions for updating Appendix 27 of the Radio Regulations in support of aeronautical HF modernization

## AI 1.10

*to conduct studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for possible new allocations for the AMS for the use of non-safety aeronautical mobile applications, in accordance with Resolution 430 (WRC-19)<sup>18</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.10 explores possible new allocations to the AMS for non-safety applications, in the 15.4 – 15.7 GHz and 22.0 – 22.21 GHz bands.

Five Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	New primary aeronautical mobile (off-route) service (AM(OR)S) allocation in the 15.4 – 15.7 GHz band
<b>Method C</b>	Remove the exception of AM(OR)S in the 22.0 – 22.21 GHz band
<b>Method D</b>	Combination of Methods B and C
<b>Method E</b>	Combination of Methods B and C with 10 MHz guard band

### Consideration

In Hong Kong, the 15.4 – 15.7 GHz band is allocated to aeronautical radionavigation service but currently vacant while the 22.0 – 22.21 GHz band is used by FS. In APG23-5, APT Members were of the preliminary view that the protection of existing primary services in the 15.4 – 15.7 GHz and 22 – 22.21 GHz frequency bands and, as appropriate, in adjacent frequency bands should be ensured.

### Hong Kong's Position

Hong Kong supports ITU-R's studies on the spectrum needs and regulatory measures for AM(OR)S operating in the 15.4 – 15.7 GHz and 22.0 – 22.21 GHz bands while ensuring the protection of existing services in the same and adjacent bands.

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<sup>18</sup> Resolution 430 (WRC-19): Studies on frequency-related matters, including possible additional allocations, for the possible introduction of new non-safety aeronautical mobile applications



## AI 1.11

*to consider possible regulatory actions to support the modernization of the Global Maritime Distress and Safety System (“GMDSS”) and the implementation of e-navigation, in accordance with Resolution 361 (Rev.WRC-19)<sup>19</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.11 considers possible regulatory actions to support the modernisation of GMDSS and implementation of e-navigation. Three issues were identified and to be resolved separately under this AI, namely:

- Issue A – modernization of GMDSS;
- Issue B – e-navigation<sup>20</sup>; and
- Issue C – introduction of additional satellite systems into the GMDSS.

Issue A considers possible regulatory actions to support the modernization of the GMDSS which has been finalised by the International Maritime Organization (“IMO”). Some measures have been adopted in the proposed Method after consideration of the IMO’s decisions and analysis of all the RR provisions impacted by these decisions.

Issue B considers possible regulatory actions in support of e-navigation developed by IMO. It was concluded in CPM23-2 that, from the spectrum regulatory point of view, the requirements for e-navigation have already been covered in the RR. Consequently, only a unique Method of NOC was proposed in the CPM report.

Issue C considers regulatory provisions, if any, based on the results of ITU-R’s studies to support the introduction of additional satellite system(s) into the GMDSS. The IMO is considering an existing geostationary orbit (“GSO”) MSS system operating at 1610 – 1626.5 MHz (Earth-to-space) and 2483.5 – 2500 MHz (space-to-Earth). As the two frequency bands concerned have already been allocated to MSS on a primary basis in the RR, no new spectrum allocation will be required for accommodating these two satellite systems into the GMDSS.

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<sup>19</sup> Resolution **361 (Rev. WRC-19)**: Consideration of possible regulatory actions to support modernization of the Global Maritime Distress and Safety System and the implementation of e-navigation

<sup>20</sup> E-navigation refers to, as specified by IMO, the harmonised collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment. (see <https://www.imo.org/en/OurWork/Safety/Pages/eNavigation.aspx>)

One to four Methods for Issues A, B and C are proposed in the CPM Report to satisfy this AI as summarised below:

<b>Issue A</b>	<b>Method A</b>	GMDSS modernisation
<b>Issue B</b>	<b>Method B</b>	NOC
<b>Issue C</b>	<b>Methods C1 – C4</b>	Four methods on revisions of the coordination and notification procedures in the RR in order to protect existing services

### Consideration

#### Issue A

In APG23-5, APT Members supported Method A under which various revisions of the regulatory provisions in the RR in relation to GMDSS modernisation were proposed.

#### Issue B

In APG23-5, APT Members supported Method B considering that the relevant regulatory requirements for e-navigation are already in place in the current RR.

#### Issue C

In APG23-5, APT Members supported the introduction of additional GSO satellite systems into the GMDSS provided that relevant coordination and notification procedures in the RR would be completed for protection of existing services operating in the same and adjacent bands. In Hong Kong, the 1610 – 1660.5 MHz (Earth-to-space) and 2483.5 MHz – 2500 MHz (space-to-Earth) bands are covered by the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (Cap. 106Z) for use by mobile earth stations without the need for licensing.

### Hong Kong's Position

Hong Kong supports the development of regulatory provisions related to the modernization of GMDSS including the addition of GSO satellite systems, and implementation of e-navigation systems while ensuring the protection of existing services in the same and adjacent bands.

## AI 1.12

*to conduct, and complete in time for WRC-23, studies for a possible new secondary allocation to the Earth exploration-satellite service (“EESS”) (active) for spaceborne radar sounders within the range of frequencies around 45 MHz, taking into account the protection of incumbent services, including in adjacent bands, in accordance with Resolution 656 (Rev.WRC-19)<sup>21</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.12 explores a new secondary allocation to the EESS (active) for spaceborne radar sounders within the range of frequencies around 45 MHz.

Five Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A1</b>	A new global secondary allocation to the EESS (active) in the 40 – 50 MHz band with a new footnote and a new Resolution to protect the incumbent in-band and adjacent-band services
<b>Method A2</b>	A new global secondary allocation to the EESS (active) in the 40 – 50 MHz band with a new footnote to protect the incumbent services in the 40 – 50 MHz band
<b>Method B</b>	A new global secondary allocation to the EESS (active) in the 40 – 50 MHz band with a new footnote to protect the secondary radiolocation service in the 42 – 42.5 MHz and 46 – 48 MHz bands
<b>Method C</b>	Establishment a global secondary allocation to the EESS (active) in the frequency band 40 – 50 MHz without protection of the incumbent services
<b>Method D</b>	NOC

### Consideration

In Hong Kong, different portions of the 40 – 50 MHz band are allocated to FS, industrial, scientific and medical service (“ISMS”), and/or land mobile service.

### Hong Kong’s Position

Hong Kong supports a new secondary allocation to EESS (active) for spaceborne radar sounder system in the frequency range of about 45 MHz while ensuring adequate protection of the existing services in the same and adjacent bands.

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<sup>21</sup> Resolution 656 (Rev. WRC-19): Possible secondary allocation to the Earth exploration-satellite service (active) for spaceborne radar sounders in the range of frequencies around 45 MHz

### AI 1.13

*to consider a possible upgrade of the allocation of the frequency band 14.8 – 15.35 GHz to the space research service (“SRS”), in accordance with Resolution 661 (WRC-19)<sup>22</sup>*

#### Key Points and Methods to Satisfy this Agenda Item

AI 1.13 considers the possibility of upgrading the secondary allocation to SRS in the 14.8 – 15.35 GHz band to primary allocation.

Five Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Upgrade of the secondary allocation to SRS (space-to-space) in the 14.8 – 15.35 GHz band to primary allocation
<b>Method C</b>	Upgrade of the secondary allocation to SRS, except SRS active and SRS passive applications, in the 14.8 – 15.35 GHz band to primary allocation
<b>Method D</b>	Upgrade of the secondary allocation to SRS in the 14.8 – 15.35 GHz band to primary allocation with provisions to avoid imposing constraints on existing systems of primary services operating in the same band
<b>Method E</b>	Upgrade of the secondary allocation to SRS in the 14.8 – 15.35 GHz band to primary allocation with provisions to both protect and avoid imposing constraints on existing and future systems of primary services operating in the same band and to ensure protection of radio astronomy service operating in the adjacent 15.35 – 15.4 GHz band

#### Consideration

In Hong Kong, the 14.8 – 15.35 GHz band is currently allocated to FS and MS only, and mainly assigned to government users for their fixed links. A possible upgrade of SRS in this band may not be too relevant to Hong Kong provided that the existing services, especially the FS, are properly protected.

#### Hong Kong’s Position

Hong Kong supports upgrade of the allocation to SRS in the 14.8 – 15.35 GHz band while ensuring adequate protection of the existing services in the same and adjacent bands.

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<sup>22</sup> Resolution 661 (WRC-19): Examination of a possible upgrade to primary status of the secondary allocation to the space research service in the frequency band 14.8 - 15.35 GHz

## AI 1.14

*to review and consider possible adjustments of the existing or possible new primary frequency allocations to the EESS (passive) in the frequency range 231.5 – 252 GHz, to ensure alignment with more up-to-date remote-sensing observation requirements, in accordance with Resolution 662 (WRC-19)<sup>23</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.14 considers possible adjustments of the existing or possible new primary frequency allocations to EESS (passive) in the 231.5 – 252 GHz band, to ensure alignment with more up-to-date remote-sensing observation requirements.

Three Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	Addition of new primary allocations to the EESS (passive) in the 239.2 – 242.2 GHz and 244.2 – 247.2 GHz bands and implementation of power limits on the FS and MS in the 239.2 – 241 GHz band
<b>Method B</b>	Addition of new primary allocations to the EESS (passive) in the 239.2 – 242.2 GHz and 244.2 – 247.2 GHz bands, and possible adjustment of the current FS and MS allocations in the 239.2 – 241 GHz band
<b>Method C</b>	NOC

### Consideration

In Hong Kong, the 231.5 – 252 GHz band, except the 244 – 246 GHz and 250 – 252 GHz bands, is not allocated. Currently the 244 – 246 GHz band is allocated to ISMS while all emissions are prohibited in the 250 – 252 GHz band.

### Hong Kong's Position

Neutral.

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<sup>23</sup> Resolution 662 (WRC-19): Review of frequency allocations for the Earth exploration-satellite service (passive) in the frequency range 231.5 – 252 GHz and consideration of possible adjustment according to observation requirements of passive microwave sensors

## AI 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 FSS globally, in accordance with Resolution 172 (WRC-19)<sup>24</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.15 deals with harmonising the use of the 12.75 – 13.25 GHz band by earth stations on board aircraft and vessels communicating with geostationary space stations in the FSS (Earth-to-space) globally. In WRC-15 and WRC-19, the 19.7 – 20.2 GHz and 29.5 – 30.0 GHz bands, as well as the 17.7 – 19.7 GHz and 27.5 – 29.5 GHz bands have been adopted in Resolution 156 (WRC-15) and Resolution 169 (WRC-19) respectively allowing the use of Earth Stations in Motion (“ESIM”) communicating with GSO FSS networks.

Two Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Addition of a new footnote and a new Resolution to specify the conditions for operation of ESIM and protection of the existing services in the same band

### Consideration

In Hong Kong, the 12.75 – 13.25 GHz band is allocated to FSS (Earth-to-space), FS and MS on a co-primary basis. Currently, the frequencies in this band were mainly assigned for fixed links and OB links.

### Hong Kong’s Position

Hong Kong supports the use of the 12.75 – 13.25 GHz band by GSO FSS (Earth-to-space) ESIMs while ensuring adequate technical conditions and regulatory measures for the protection of the existing services in the same and adjacent bands.

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<sup>24</sup> Resolution 172 (WRC-19): Operation of earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite services in the frequency band 12.75 – 13.25 GHz (Earth-to-space)

## AI 1.16

*to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 17.7 – 18.6 GHz, 18.8 – 19.3 GHz and 19.7 – 20.2 GHz (space-to-Earth) and 27.5 – 29.1 GHz and 29.5 – 30 GHz (Earth-to-space) by non-geostationary (“non-GSO”) FSS earth stations in motion, while ensuring due protection of existing services in those frequency bands, in accordance with Resolution 173 (WRC-19)<sup>25</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.16 considers the use of the 17.7 – 18.6 GHz, 18.8 – 19.3 GHz and 19.7 – 20.2 GHz bands by non-GSO FSS (space-to-Earth) ESIM, and the 27.5 – 29.1 GHz and 29.5 – 30 GHz bands by non-GSO FSS (Earth-to-space) ESIM. Studies had been conducted on the sharing and compatibility between aeronautical and maritime ESIMs and terrestrial as well as space services allocated in the aforementioned frequency bands.

Two Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Addition of a new footnote and a new Resolution to specify the conditions for operation of ESIM and protection of the existing services in the same band

### Consideration

In Hong Kong, parts of the 27.5 – 28.35 GHz band has been assigned for large scale public mobile services, and the 28.35 – 29.1 GHz and 29.5 – 30 GHz bands have been mainly assigned for FSS. As for the remaining frequency bands covered under this AI, they have been mainly assigned for fixed links and FSS.

### Hong Kong’s Position

Hong Kong supports the use of the frequency bands concerned by non-GSO FSS ESIMs while ensuring adequate technical conditions and regulatory measures for the protection of the existing services in the same and adjacent bands.

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<sup>25</sup> Resolution 173 (WRC-19): Use of the frequency bands 17.7 – 18.6 GHz, 18.8 – 19.3 GHz and 19.7 – 20.2 GHz (space-to-Earth) and 27.5 – 29.1 GHz and 29.5 – 30 GHz (Earth-to-space) by earth stations in motion communicating with non-geostationary space stations in the fixed-satellite service

## AI 1.17

*to determine and carry out, on the basis of ITU-R studies in accordance with Resolution 773 (WRC-19)<sup>26</sup>, the appropriate regulatory actions for the provision of inter-satellite links in specific frequency bands, or portions thereof, by adding an inter-satellite service (“ISS”) allocation where appropriate*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.17 covers the appropriate regulatory actions for the provision of inter-satellite links in the 11.7 – 12.7 GHz, 18.1 – 18.6 GHz, 18.8 – 20.2 GHz and 27.5 – 30 GHz bands, or portions of them, by adding an ISS allocation where appropriate. Various options of technical conditions and regulatory measures were included in the CPM Report covering, among others, the operations of ISS and protection of terrestrial services, EESS, non-GSO satellite systems and GSO FSS networks.

Two Methods are proposed in the CPM Report for WRC-23 to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Addition of a new Resolution to address the regulatory mechanisms to operate the satellite-to-satellite links in the 18.1 – 18.6 GHz, 18.8 – 20.2 GHz and 27.5 – 30 GHz bands and NOC for the 11.7 – 12.7 GHz band <sup>27</sup> .

### Consideration

In Hong Kong, the 18.1 – 18.6 GHz and 18.8 – 20.2 GHz bands are allocated to FS and FSS, while portions of the 27.5 – 30 GHz band are allocated to FS, FSS and/or MS, in particular, parts of the 27.5 – 28.35 GHz band has been assigned for large scale public mobile services.

### Hong Kong’s Position

Hong Kong supports provision of inter-satellite links in the 18.1 – 18.6 GHz, 18.8 – 20.2 GHz and 27.5 – 30 GHz bands while ensuring adequate technical conditions and regulatory measures for the protection of the existing services in the same and adjacent bands.

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<sup>26</sup> Resolution 773 (WRC-19): Study of technical and operational issues, and regulatory provisions for satellite-to-satellite links in the frequency bands 11.7 – 12.7 GHz, 18.1 – 18.6 GHz, 18.8 – 20.2 GHz and 27.5 – 30 GHz

<sup>27</sup> After deliberations at CPM23-2, ISS in the 11.7 – 12.7 GHz band was found difficult in sharing with existing services based on the results of ITU-R studies and hence this frequency band would not be considered for ISS.



## AI 1.18

*to consider studies relating to spectrum needs and potential new allocations to the MSS for future development of narrowband mobile-satellite systems, in accordance with Resolution 248 (WRC-19)*<sup>28</sup>

### Key Points and Methods to Satisfy this Agenda Item

AI 1.18 considers spectrum needs and potential new allocations to MSS in the 1695 – 1710 MHz, 3300 – 3315 MHz and 3385 – 3400 MHz bands in Region 2, and the 2010 – 2025 MHz band in Region 1 for future development of narrowband mobile-satellite systems.

Three Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	NOC except revision of Resolution <b>248 (WRC-19)</b> to address the difficulties and inconsistencies of the Resolution
<b>Method C</b>	Primary allocation to MSS (Earth-to-space) in the 2010 – 2025 MHz band in Region 1

### Consideration

This AI studies spectrum use in Regions 1 and 2 rather than Region 3.

### Hong Kong's Position

Neutral.

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<sup>28</sup> Resolution **248 (WRC-19)**: Studies relating to spectrum needs and potential new allocations to the mobile-satellite service in the frequency bands 1695 – 1710 MHz, 2010 – 2025 MHz, 3300 – 3315 MHz and 3385 – 3400 MHz for future development of narrowband mobile-satellite systems

## AI 1.19

*to consider a new primary allocation to the FSS in the space-to-Earth direction in the frequency band 17.3 – 17.7 GHz in Region 2, while protecting existing primary services in the band, in accordance with Resolution 174 (WRC-19)<sup>29</sup>*

### Key Points and Methods to Satisfy this Agenda Item

AI 1.19 considers a new primary allocation to FSS (space-to-Earth) in the 17.3 – 17.7 GHz band in Region 2, while protecting existing primary services in the band.

Four Methods are proposed in the CPM Report to satisfy this AI:

<b>Method A</b>	NOC
<b>Method B</b>	Modification of the RR to allocate the 17.3 – 17.7 GHz band in Region 2 to FSS (space-to-Earth) with two alternative approaches
<b>Method C</b>	Modification of the RR to allocate the 17.3 – 17.7 GHz band in Region 2 to FSS (space-to-Earth), limiting the FSS operation to GSO satellites
<b>Method D</b>	Modification of RR in order to allocate the 17.3 – 17.7 GHz band in Region 2 to FSS (space-to-Earth), extending the regulatory provisions used in Region 1 to Region 2, as well as the addition of other regulatory provisions

### Consideration

This AI studies spectrum use in Regions 2 rather than Region 3.

### Hong Kong's Position

Neutral.

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<sup>29</sup> Resolution 174 (WRC-19): Primary allocation to the fixed-satellite service in the space-to-Earth direction in the frequency band 17.3 – 17.7 GHz in Region 2

## AI 7

*to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, on advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution 86 (Rev.WRC-07)<sup>30</sup>, in order to facilitate rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit*

This AI covers 11 Topics, namely Topics A, B, C, D, E, F, G, H, I, J and K. Having regard to industry's inputs and the implications on radiocommunication services, OFCA has identified Topics B, C and F for consideration.

### ***Topic B – Non-GSO bringing into use post-milestone procedure***

#### Key Points and Methods to Satisfy this Topic

Topic B considers the possible adoption of a procedure to apply in cases where a non-GSO system subject to the milestone procedure in Resolution 35 (WRC-19) has completed the milestone procedure, but subsequently experiences a sustained reduction in the number of space stations deployed and capable of transmitting/receiving the assigned frequencies. When developing a post-milestone procedure, some degree of operational flexibility, including temporary operations, which is necessary for the maintenance of the non-GSO system in the FSS, BSS and MSS, needs to be duly considered.

Two methods are proposed in the CPM Report to satisfy this Topic:

<b>Method B1</b>	NOC
<b>Method B2</b>	Permit some operational flexibilities in the maintenance of non-GSO systems while keeping reasonable alignment over time between the number of capable non-GSO system satellites deployed for a system, and the number notified in the Master International Frequency Register (“MIFR”) through a Resolution referred to in the provision of Article 11. Method B2 of the RR contains two options regarding the required threshold for decreases in the number of deployed satellites capable of transmitting/receiving the recorded frequency assignments to apply such a Resolution.

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<sup>30</sup> Resolution 86 (WRC-07): Implementation of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference

### Consideration

There is no provision in RR that specifically addresses the case in a regulatory sense where a non-GSO system has completed the milestone process and subsequently experiences an intermediate or long-term reduction of the number of satellites deployed.

### Hong Kong's Position

Hong Kong supports the development of a post-milestone procedure to ensure that the content of the MIFR for non-GSO systems subject to the milestone procedure in Resolution 35 (WRC-19) aligns with the actual deployments of the non-GSO systems in space, in particular for very large constellations of non-GSO systems.

### ***Topic C – Protection of geostationary-satellite networks in the mobile-satellite service operating in the 7/8 GHz and 20/30 GHz bands from emissions of non-geostationary-satellite systems operating in the same frequency bands and identical directions***

#### Key Points and Methods to Satisfy this Topic

Topic C considers the effectiveness of the existing regulatory protection of the GSO MSS from interference caused by non-GSO systems, and any possible inconsistencies in the provisions of the RR applicable to the frequency bands listed as follows (“Concerned Bands”):

- 7250 – 7750 MHz (space-to-Earth);
- 7900 – 8025 MHz (Earth-to-space);
- 20.2 – 21.2 GHz (space-to-Earth); and
- 30 – 31 GHz (Earth-to-space).

Three methods are proposed in the CPM Report to satisfy this Topic:

<b>Method C1</b>	NOC
<b>Method C2</b>	A new provision in RR Article <b>22</b> extending the application of the concept of provisions of RR No. <b>22.2</b> for the protection of GSO satellite networks operating in the mobile-satellite service in the Concerned Bands.
<b>Method C3</b>	Modification of RR No. <b>5.461</b> and the additions of two new footnotes in RR Article <b>5</b> extending the application of the concept of provisions of RR No. <b>22.2</b> for the protection of GSO satellite networks operating in the mobile-satellite service in the Concerned Bands.

### Consideration

Under RR No. **22.2**, non-GSO systems shall not cause unacceptable interference to GSO networks in FSS and BSS. In consideration of that GSO MSS networks are not covered under RR No. **22.2**, the protection of GSO MSS networks from non-GSO systems in the Concerned Bands is not ensured.

### Hong Kong's Position

Hong Kong supports extending the applications of the concept of provisions of RR No. 22.2 for the protection of GSO MSS networks from non-GSO systems in the Concerned Bands.

### ***Topic F – Excluding uplink service area in RR Appendix 30A for Regions 1 and 3 and RR Appendix 30B***

#### Key Points and Methods to Satisfy this Topic

Topic F considers to establish adequate mechanisms to prevent one administration from creating an obstacle to the establishment of space systems by other administrations in the feeder link in the RR Appendix **30A** or uplink in the RR Appendix **30B**, in compliance with the Resolution **2 (Rev.WRC-03)** regarding the registration with the Radiocommunication Bureau of frequency assignments for space radiocommunication services and their use do not provide any permanent priority for any individual country or groups of countries and do not create an obstacle to the establishment of space systems by other countries.

Four methods are proposed in the CPM Report to satisfy this Topic:

<b>Method F1</b>	NOC
<b>Methods F2, F3 and F4</b>	Propose to add a new provision to Article <b>4</b> of RR Appendix <b>30A</b> to allow an administration to request at any time the exclusion of its territory from the feeder-link service area of a satellite network of other administrations. These three methods also include measures to avoid networks with uplink coverage area extending beyond the service area to seek protection because of this enlarged coverage area, where Methods F2 and F3 include such measures for both RR Appendices <b>30A</b> and <b>30B</b> and Method F4 includes such measures only for RR Appendix <b>30A</b> .

### Consideration

The planned space services are based on the principle of equitable access to the satellite orbit/frequency spectrum in accordance with Article 44 of the ITU Constitution. To this end, relevant provisions of RR Appendix **30/30A** and RR Appendix **30B** specifically aim at

ensuring this principle. Despite the purpose of the planned space services together with their current associated procedures, submissions of global uplink coverage area or submissions in which the coverage area extends well beyond the service area may create obstacles for an administration or a group of named administrations to deploy its new national system or their sub-regional systems, as appropriate for close orbital separations.

#### Hong Kong's Position

Hong Kong supports allowing an administration to request at any time the exclusion of its territory from the feeder-link service area of a satellite network of other administrations in RR Appendix **30A**. Hong Kong also supports the establishment of appropriate mechanisms for the feeder-link in Appendix **30A** or the uplink in Appendix **30B** to avoid networks with uplink coverage area extending beyond the service area to seek protection because of this enlarged coverage area.

**AI 9.1**  
**(Topics a, b, c, d)**

*to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention, on the activities of the Radiocommunication Sector since WRC-19*

This AI considers and approves as applicable studies related to new or updates on technical requirements and sharing feasibility with the incumbent services of four systems/services covered under four respective topics of this AI, namely Topics a, b, c and d, as summarised in the ensuing paragraphs.

*9.1 Topic a – In accordance with Resolution 657 (Rev.WRC-19)<sup>31</sup>, review the results of studies relating to the technical and operational characteristics, spectrum requirements and appropriate radio service designations for space weather sensors with a view to describing appropriate recognition and protection in the RR without placing additional constraints on incumbent services*

Key Points and Possible Actions to Satisfy this Topic

Space weather observations from ground-based and space-based systems are important in detecting solar activity events that could adversely affect economies, human welfare and national security. Some of the space weather sensor systems operate by receiving signals of opportunity, including, but not limited to, low-level natural emissions of the Sun, Earth's atmosphere and other celestial bodies, and therefore may suffer harmful interference at levels which could be tolerated by other radio systems. However, there is currently no frequency bands documented in the RR for space weather sensor applications.

Considering the complexity of the issue to fully satisfy the recognition and protection of space weather applications, a two-step approach is proposed in the CPM Report. The first step will be to provide recognition in the RR by associating space weather observations with a radiocommunication service under which the majority of space weather sensors can operate. The second step will be to consider further studies for appropriate modifications in the RR to ensure protection of space weather applications. A new Resolution on the importance of space weather sensor systems is proposed in the CPM Report, among others.

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<sup>31</sup> Resolution 657 (Rev. WRC-19): Protection of radio spectrum-reliant space weather sensors used for global prediction and warnings

**9.1 Topic b** – Review the amateur service and the amateur-satellite service allocations in the frequency band 1240 – 1300 MHz to determine if additional measures are required to ensure protection of the radionavigation-satellite service (“RNSS”) (space-to-Earth) operating in the same band in accordance with Resolution 774 (WRC-19)<sup>32</sup>

Key Points and Possible Actions to Satisfy this Topic

The 1240 – 1300 MHz band is allocated to RNSS (space-to-Earth) (space-to-space) globally on a primary basis and used by various global and regional RNSS systems (e.g. GALILEO, GLONASS, COMPASS, GPS) in different portions of the band, for various applications, including high-accuracy location services with ubiquitous deployment of RNSS receivers. In addition, the 1240 – 1300 MHz band is allocated to the amateur and amateur-satellite services on a secondary basis globally.

ITU-R is developing a new Recommendation<sup>33</sup> providing guidelines to avoid harmful interference to the RNSS (space-to-Earth) receivers. This new Recommendation could include encouragement for the amateur and amateur-satellite services to use specific sub-bands with sufficient frequency offsets from the spectrum main lobes of RNSS signals, maximum emission power level and emission bandwidth restrictions to enhance the protection of RNSS (space-to-Earth) receivers in the bands under consideration.

**9.1 Topic c** – Study the use of IMT systems for fixed wireless broadband in the frequency bands allocated to FS on a primary basis, in accordance with Resolution 175 (WRC-19)<sup>34</sup>

Key Points and Possible Actions to Satisfy this Topic

When some of the initial publications of relevant ITU-R Recommendations, Reports and Handbook of fixed wireless access were developed, the expectations for fixed wireless applications were very different from those of today, including fixed wireless access, backhaul, core, transport and others. Working Parties (“WPs”) 5A and 5C therefore found it necessary to revise the existing relevant publications and to develop any new ones as required to reflect the new technological capabilities and approaches of fixed wireless applications. Since not all received input contributions were fully discussed by WPs 5A and 5C and jointly agreed, two approaches are proposed in the CPM Report:

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<sup>32</sup> Resolution 774 (WRC-19) – Studies on technical and operational measures to be applied in the frequency band 1240 – 1300 MHz to ensure the protection of the radionavigation-satellite service (space-to-Earth)

<sup>33</sup> Recommendation ITU-R M.[AS.GUIDANCE]

<sup>34</sup> Resolution 175 (WRC-19) – Use of International Mobile Telecommunications systems for fixed wireless broadband in the frequency bands allocated to the fixed service on a primary basis



<b>Approach 1</b>	Development of new ITU-R Recommendation(s), Report(s) and Handbook through submission of contribution to relevant ITU-R subsequent meetings.
<b>Approach 2</b>	Revision of Recommendation(s), Report(s) and Handbook through submission of contribution to relevant ITU-R subsequent meetings. If the proposed revision could not satisfy the requirements of this topic, then new Recommendation(s), Report(s), and/or Handbook may be developed.

**9.1 Topic d – Protection of EESS (passive) in the frequency band 36 – 37 GHz from non-GSO FSS space stations**

Key Points and Possible Actions to Satisfy this Topic

This Topic deals with two potential interference scenarios which had been studied but not fully resolved under AI 1.6 for WRC-19, while taking into account the FSS characteristics provided by the relevant ITU-R contributing group and the EESS (passive) characteristics contained in Recommendation ITU-R RS.1861-1, as outlined below:

- interference into the sensing channel of EESS (passive) from non-GSO FSS constellations operating in the frequency band 37.5 – 38 GHz at a lower altitude than EESS (passive) sensors; and
- interference into the cold calibration channel of EESS (passive) from non-GSO FSS constellations operating in the frequency band 37.5 – 38 GHz at a higher altitude than EESS (passive) sensors.

Hong Kong's Position

Hong Kong supports conducting relevant ITU-R's studies on Topics a to d.

**AIs 2, 3, 4, 5, 6, 8, 9.2, 9.3 and 10**

AIs 2, 3, 4, 5, 6, 8, 9.2, 9.3 and 10 are related to administrative work of WRC-23 and general issues. Among others, ITU-R will report to WRC-23 a summary of their work since the last WRC. Hong Kong would keep abreast of the relevant development.