

GSOA Response to MCMC's Public Consultation on Proposed Malaysia's Positions for WRC-23 Agenda Items

(submission sent to Spectrum Planning and Assignment Division: npwg.sec@mcmc.gov.my)

15 August 2023

The Global Satellite Operators Association (GSOA) welcomes the opportunity to respond to the Malaysian Communications and Multimedia Commission (MCMC) consultation on the Proposed Malaysia's Positions for WRC-23 Agenda Items.

GSOA is a non-profit organisation established with the objective of serving and promoting for collaboration between satellite operators globally to provide a unified voice for the sector.¹

GSOA fully supports the proposed Malaysia's positions for WRC-23 agenda items 1.8, 1.17, 1.19 and 9.1 (Topic C). We provide specific comments for several WRC-23 agenda items with details as contained in the annex enclosed in this document.

Furthermore, GSOA would like to take this opportunity to share some industry studies conducted by Plum Consulting with respect to assessing the use by satellite services of 7-24 GHz spectrum² and examining the current assignment and usage of IMT spectrum³.

GSOA invites the MCMC to consider these studies when formulating Malaysia's position for WRC-23 agenda item 10 in relation to a possible new IMT agenda item for WRC-27, particularly whether there is truly a need for additional spectrum, and any technically justified reason that the candidate bands subject to study would uniquely address the intended IMT usage scenarios that are otherwise not able to be satisfied by bands within existing IMT identifications. If Malaysia considers that a new IMT agenda item is indeed necessary, GSOA would encourage Malaysia to consider excluding 10.7-14.8 GHz (satellite Ku band) and 17.3-21.2 GHz (satellite Ka band) from the scope of such agenda item based on the reason that these are the core satellite bands used for providing global satellite connectivity for the unserved and underserved residential and enterprise markets as well as aviation, maritime, utilities and broadcasting industries.

GSOA sincerely hopes the MCMC will take these elements into account when finalizing Malaysia's Positions.

¹ A complete list of GSOA Members can be found at <https://gsoasatellite.com/members/>

² https://gsoasatellite.com/reports_and_studies/assessing-the-use-by-satellite-services-of-spectrum-in-the-7-to-24-ghz-bands/

³ https://gsoasatellite.com/reports_and_studies/examining-the-current-assignment-and-usage-of-mobile-spectrum/

ANNEX

Agenda Item	Comments and Views on Proposed Malaysia's Positions
Fixed, Mobile and Broadcasting Issues	
1.1	No comment
1.2	<p>Malaysia has indicated that it would not oppose the identification of IMT in the bands identified under agenda item 1.2 for other regions and that at the CPM23-2 there was a proposal to identify the 6425-7025 MHz frequency band for some countries in Region 3 for IMT by creating a new RR footnote with appropriate conditions.</p> <p>In the band 6425-7075 MHz, studies conducted by GSOA and administrations show excessive interference to satellites, even with a very low IMT density. Any limit to protect the satellite (e.g. 25 dB power reduction) would make IMT operations impractical. In other bands – e.g. 2655-2690 MHz – IMT already caused documented harmful interference to satellite receivers.</p> <p>GSOA is of the view that any identification of IMT in the band 6425-7025 MHz will impact satellite receivers with an aggregate level of interference from IMT Base Stations operating in a global, hemispherical or spot beam covering Regions 1 and 3. Based on studies conducted by GSOA and further validated by an independent study from UK Ofcom GSO satellite operating over Region 1 and 3 would be impacted from IMT Base Stations operating in Region 1. Therefore we would request that Malaysia would give careful consideration to the implications and impact of any identifications of IMT in the band 6425-7025 MHz to Regions 1 and 3 for their continued use and operations of Fixed Satellite Services and Fixed services within the Regions 1 and 3 and prevent potential loss of 300 MHz as per AP30B as part of your national heritage.</p> <p>For many APAC countries, FS and C-band FSS are part of the national infrastructure today and will continue to be well into the future. Hence, the protection of these existing services is vital.</p> <p>GSOA requests that Malaysia to carefully evaluate the findings and consider the demand by a number of existing users for this spectrum in the band 6425-7125 MHz including safeguarding the national heritage of 300 MHz in AP30B also for Region 3.</p> <p>By maintaining the status quo for these frequencies band in both regions, Malaysia will be able to maximize the long-term benefits to the country, by taking a technology neutrality approach, balancing the spectrum allocation and allowing</p>

Agenda Item	Comments and Views on Proposed Malaysia's Positions
	<p>the most effective use of other access technologies that can make the most efficient use of this spectrum; these include</p> <ul style="list-style-type: none"> • to bridge the digital divide and serve the rural and remote populations in many of the APAC countries; • continue to benefit from having the band for the FS links that are established and serving the country; • to ensure continued unaffected maritime and aeronautical operations in the unplanned band; • to protect the FSS planned band, AP30B as part of the national heritage assigned for FSS use; and • to enable the use of the band for other newer access technologies that would provide a much greater level of economies of scale. <p>All of these will have a significant social and economic impact on your national economy. Therefore, as part of the national policy, very careful consideration should be given taking into account inputs from Civil Aviation Authorities, Maritime Agencies, Metrological offices, Defence forces etc to adopt the most appropriate method that will serve to provide maximum benefits to the country, and this would provide Malaysia with maximum flexibility by adopting NO CHANGE with Methods 4A and 5A as proposed in CPM Report.</p>
1.3	<p>While GSOA understood Malaysia's position under Agenda Item 1.3 (WRC-23) considering Malaysia is one of Region 3 countries, GSOA agree and fully support the protection of existing services and their future development due to a possible upgrade of Mobile Services to Primary allocation in the 3600 -3800 MHz frequency band.</p> <p>Below are GSOA views under Agenda Item 1.3 (WRC-23):</p> <ol style="list-style-type: none"> 1) An IMT identification is not in the scope of the agenda item, nor in Resolution 246 (WRC 19). 2) No undue constraints should be imposed on the existing services and their future development. 3) GSOA supports No Change to ITU RR for 3.6-3.8 GHz in R1 but recognizes the various preferences in R1. An upgrade of MS in 3.6-3.7 GHz could be a balance between MS and FSS use. Methods which do not propose any conditions to protect existing services should also be opposed.
1.4	No comment
1.5	No comment
9.1(c)	Fully support the Malaysia's position

Agenda Item	Comments and Views on Proposed Malaysia's Positions
RR No. 21.5	<p>GSOA agrees with the Malaysia's approach in using TRP within a reference bandwidth as the parameter for the purpose of verification of RR 21.5 in the notification of IMT stations with antenna that consists of an array of active elements, such as Active Antenna System (AAS).</p> <p>GSOA would encourage Malaysia to consider the appropriateness of 200 MHz as the reference bandwidth since this is aligning with the nominal bandwidth used in the sharing study conducted for WRC-19 Agenda item 1.13.</p> <p>Although the adoption of TRP as an approach to verify RR 21.5 does not necessarily need changes to the Radio Regulations, there is still a need to reflect how TRP could be applied when filling in the necessary notification forms. Thus, an amendment to the Rules of Procedures is one possibility to clarify how TRP could be applied. Nevertheless, GSOA would encourage Malaysia to be flexible on position such as 'no change to RR 21.5' in the event that an alternative approach is identified to implement the necessary modification to RR 21.5 to attain a similar outcome as originally intended by the TRP approach as supported in the Malaysia's position.</p>
Aeronautical, Maritime and Amateur Issues	
1.6	No comment
1.7	No comment
1.8	Fully support the Malaysia's position
1.9	No comment
1.10	No comment
1.11	No comment
9.1(b)	No comment
Res. 427	No comment
Science Issues	

Agenda Item	Comments and Views on Proposed Malaysia's Positions
1.12	No comment
1.13	No comment
1.14	No comment
9.1 (a)	No comment
9.1 (d)	No comment
Res. 655	No comment
Satellite Issues	
1.15	<p>GSOA much appreciated for Malaysia's support to Method B to satisfy WRC-23 Agenda Item 1.15.</p> <p>The draft new Resolution [A115] (WRC-23) contains technical, regulatory and operational conditions for operation of A-ESIM and M-ESIM. There are still areas in the draft new Resolution [A1.15] (WRC-23) which contain options and will need to be further discussed and resolved in WRC-23.</p> <p>Below are the remaining issues in the draft new Resolution [A115]:</p> <ul style="list-style-type: none"> • Interference management • Status of Ku-band downlink AP30B Band (i.e. 10.7 – 10.95 GHz and 11.2 – 11.45 GHz) • Methodology to verify the compliance pfd mask limit applied to A-ESIM • ESIM assignments should be recorded under § 6.25 of Article 6 or not • Qualifier to implement the Resolution [A115] • Deletion of ESIM terminal capability contained in Annex 5 • Publication of AP 30B ESIM Information • Reference bandwidth on pfd mask limit applied to A-ESIM which contained in Annex-2 <p>The above remaining issues consists of few options in part of the draft new Resolution [A115] and GSOA urges MCMC to consider choosing the following options within the current draft New Resolution [A115] contained in the CPM Report:</p>

Agenda Item	Comments and Views on Proposed Malaysia's Positions
	<p>a) Option 2 of Resolves 2 which the ESIM assignments should be recorded under § 6.25 without qualifier.</p> <p>One of the reason would be that 6.25 on planned bands is similar with 11.41 on unplanned bands 11.41 ensures that if networks with higher priority refuse to coordinate in good faith, the later networks which are seeking the agreement, have the option to operate. In addition Resolution 169 (WRC-19) allows the use of GSO ESIMs with filings recorded under 11.41</p> <p>b) Option 2 of Resolves 9.1 and of Resolves 9.4 in relation to interference management issues.</p> <p>It's simply because other parties involvement to resolve interference issues is important. It's not realistic to not be able to get support from other parties to resolve the interference problem.</p> <p>c) Option 2 of resolves further 8bis and of Annex-5 in relation to ESIM terminal capability.</p> <p>The reason would be that ESIM terminal capability elements are not appropriate in a Resolution and would be better kept in the ITU-R Reports and/or Recommendations.</p> <p>d) Option 2 of Resolves 11 in relation to the implementation of the Resolution [A115]</p> <p>Option 2 is more reasonable than Option 1. However, once the remaining issues resolved, then Resolves 11 might not be needed anymore.</p> <p>e) Option 2 of <i>instructs the Director of the Radiocommunication Bureau 4</i> in relation to AP30B ESIM information</p> <p>Countries authorizing ESIM is a national matters and It's not a common ITU-R practice to inform about national licensing matters.</p> <p>f) Option 1 of Annex-2 Part II in relation to reference bandwidth</p> <p>The detail justifications could be referred to document WP4A/927 and WP4A/930 outlined the rationale for the use of the 14 MHz reference bandwidth for the A-ESIM pfd mask.</p>
1.16	For the protection of space services, non-GSO ESIM characteristics shall remain within the envelope characteristics of the typical earth stations associated with the non-GSO system.

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	<p>For the protection of GSO FSS networks, the relevant EPFD limits in Article 22 shall apply</p> <p>For the protection of the Earth Exploration Satellite Service (passive) in 18.6-18.8 GHz, the PFD limits (Annex 3 of Draft New Resolution [A116]) from the technical studies shall apply.</p> <p>As part of the support for Method B, GSOA urges MCMC to consider choosing the following options within the CPM text with reference to the Draft New Resolution [A116]:</p> <ul style="list-style-type: none"> a) Selection of Option 1 for both Annex 1 Part 1 Section 1.2 (max EIRP density transmitted towards the territory of coastal state of 24.44dBW/14MHz for M-ESIM) and Annex 1 Part 2 Section 2.1 (reference bandwidth 14 MHz for the maximum PFD produced at the surface of the Earth for ESIM altitudes above 3Km). <p>The sharing environment between non-GSO ESIM and terrestrial services in 27.5-29.1 GHz and 29.5-30 GHz is the same as for GSO ESIM. As such, the same sharing conditions as for GSO ESIM in Resolution 169 (WRC-19) should also apply to non-GSO ESIMs under this Agenda Item (i.e. the same PFD limit on the ground for A-ESIM and the same minimum distance from the coast and maximum EIRP spectral density towards the horizon for M-ESIM). Protection of terrestrial services with secondary allocation in 29.5-30 GHz shall only apply to administrations mentioned in No. 5.542.</p> <ul style="list-style-type: none"> b) Selection of Option 2 In <i>resolves 1.3.1</i> – The notifying administration of the non-GSO FSS system with which ESIMs communicate is responsible for resolving the case of unacceptable interference; <p>While the notifying administration is responsible, the flag administration or the authorising administration could also help, <u>should they agree to do so.</u></p> <ul style="list-style-type: none"> c) Deletion of both options In <i>resolves 8</i> <p>Such options are not suitable as part of a Resolution as all issues need addressing at WRC for the Resolution to be approved.</p> <ul style="list-style-type: none"> d) Selection of Option 1 in <i>resolves further 9</i> <p>No need for Annex 4. Such hardware and software requirements are not appropriate in a resolution and would be better kept in a report or recommendation, if required.</p> <ul style="list-style-type: none"> e) Selection of Option 2 in <i>instructs the Director of the Radiocommunication Bureau 5</i>

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	<p>The publication of the list of countries authorizing non-GSO ESIM in their territories does not help in identifying the notifying administration nor resolve cases of interference. Instead, it adds further complications and a discrimination with respect to other types of ESIMs operating in the same or other frequency bands.</p> <p>In general, GSOA is supportive of options that are viable, implementable and sustainable for long-term operations of non-GSO ESIMs and oppose unnecessary and unjustified differentiation in the regulatory framework for non-GSO ESIM compared to the one for GSO ESIM.</p>
1.17	Fully support the Malaysia's position
1.18	<p>GSOA agrees with the MCMC that the required studies under WRC-23 agenda item 1.18, which is primarily a Regions 1 and 2 issue, were not completed. The most certain way to avoid unacceptable interference and adverse impact on existing services in Region 3 in the identified and adjacent frequency bands is to support Method A; No Change (NOC) to the Radio Regulations and suppression (SUP) of Resolution 248 (WRC-19), or no regulatory action and allocations in Region 1 and 2.</p> <p>GSOA notes that preliminary WRC-27 Agenda Item 2.13 (see Resolution 812 (WRC-19)) effectively extends the studies and allocations of WRC-23 Agenda Item 1.18 (and Resolution 248 (WRC-19)) to be worldwide, that is to include Region 3. GSOA reiterates that the most effective way to ensure that unacceptable interference and adverse impact on existing services in Region 3 is to support Method A for WRC-23 Agenda Item 1.18 and therefore to also suppress draft WRC-27 Agenda Item 2.13.</p> <p>Instead GSOA recommends that MCMC support a new future agenda item to allocate additional spectrum to the MSS to address the increasing demand for mobile satellite applications (and satellite mobility generally), direct-to-device connectivity and to avoid spectrum shortfall and crowding in lower bands. MSS can provide coverage to underserved and remote areas, support evolving technologies, and facilitate the integration of satellite and terrestrial networks.</p>
1.19	Fully support the Malaysia's position

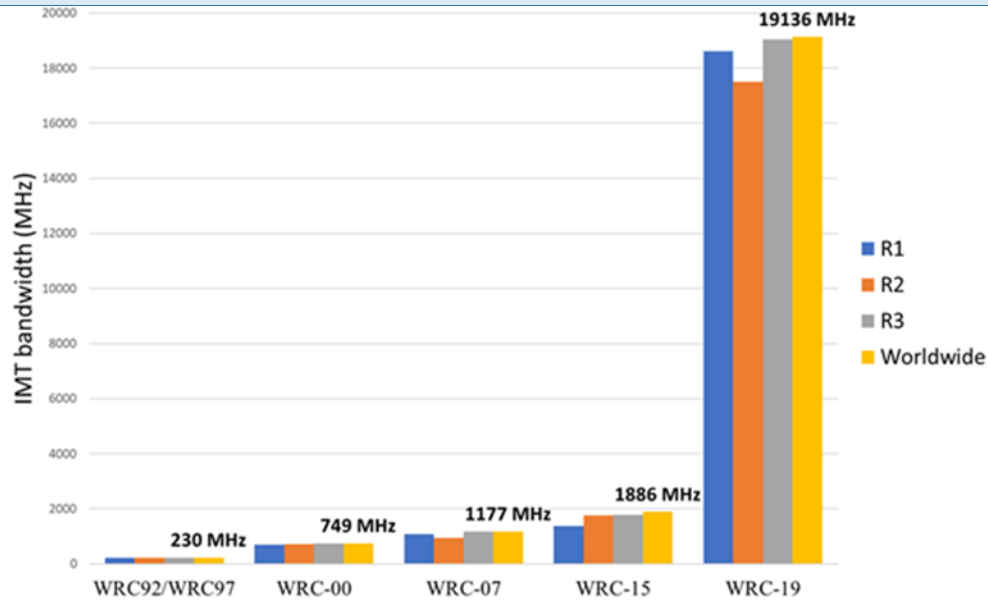
Agenda Item	Comments and Views on Proposed Malaysia's Positions	
7	Topic A	No comment
	Topic B	No comment
	Topic C	No comment
	Topic D	No comment
	Topic E	<p>GSOA is very concerned by Methods which do not take into account operational or soon to be operational satellite networks which would be obliged to stop its operation without any possibility of discussions as soon as a new ITU Member State decides to request an allotment in an orbital position close to the satellite already in operation.</p> <p>GSOA supports Method E2 of the CPM Report to grant new ITU Member States the same privileges adopted in Resolution 170 (WRC-19). This includes developing specific measures for new ITU Member States by further involving Bureau support, limited coordination activities for New Member States while granting some certainties for operational or nearly operational satellite networks.</p>
	Topic F	<p>GSOA supports developing specific measures to avoid creating obstacles to establish space systems over national territories without creating uncertainties for operational network or even national network.</p> <p>GSOA believes that bilateral coordination and/or national licensing conditions solutions can address encountered problems on a case-by-case basis.</p> <p>It should be noted that the alignment of the coverage area with the service area is not always feasible. Therefore, GSOA cannot support Method F2 which requests a notifying administration of a satellite network having its relative satellite antenna gain up to -20 dB over the territory of another Administration, to accept uplink interference emanating from the territory of another Administration, if so requested, as this introduces regulatory uncertainty.</p> <p>GSOA would be in favour of Method F1 and alternatively Method F3 of the CPM Report.</p>

Agenda Item	Comments and Views on Proposed Malaysia's Positions	
	Topic G	No comment
	Topic H	<p><i>Issue of Implicit agreement:</i></p> <p>GSOA fully understand that the protection of the Plan is crucial and supports developing specific measures to address this concern while also addressing the potential problem related to no reply to coordination requests from additional uses/systems which is not addressed in Method H1B.</p> <p>GSOA supports Method H1A ie No Change to the Radio Regulations. GSOA could also consider supporting Method H1C in the CPM Report as an alternative, which is similar to the new type of agreement as suggested in Topic I that could potentially replace the implicit agreements regulations</p> <p><i>Issue of EPM degradation tolerance:</i></p> <p>GSOA recalls that the increase in the EPM degradation tolerance from 0.25 to 0.45 dB adopted by WRC-2000 was linked with approved additional modifications as adoption of more robust digital modulation for the Plan.</p> <p>GSOA considers that modification of the EPM degradation tolerance to go back to the value pre-WRC-2000 is not feasible. GSOA supports Method H2A ie No Change to the Radio Regulations.</p>
	Topic I	GSOA supports developing specific measures to restore adequate overall aggregate carrier-to-interference levels (Reference Situation) without changing the orbital position of a national allotment, so long as they are voluntary and not mandatory, as proposed in the new type of agreement under Method I2.
	Topic J	No comment
	Topic K	No comment
General and Regulatory Issues		
2	No comment	

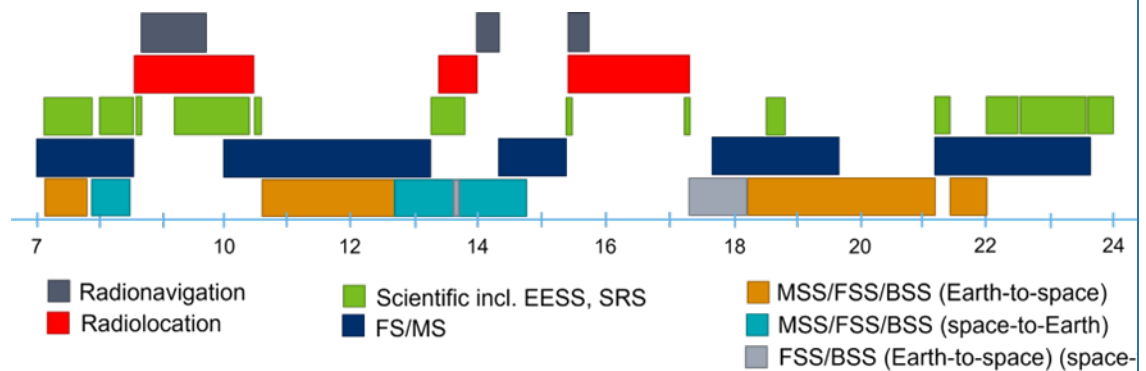
Agenda Item	Comments and Views on Proposed Malaysia's Positions
4	No comment
8	No comment
10	<p>Study proposal on future IMT identifications in the band 7–24 GHz</p> <p>At the last APG23-5 meeting, some APT Members submitted a proposal for inclusion in the agenda of WRC-27 to consider identification of specific frequency bands within the frequency ranges AA-BB GHz and CC-DD GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis.</p> <p>In relation to such study proposal, the following facts regarding the need to conduct ITU-R study for potential future IMT spectrum identification should be considered:</p> <ol style="list-style-type: none"> 1. The below chart indicates the total significant amount of spectrum identified for IMT at various WRCs and it is important to avoid spectrum warehousing since spectrum is a finite resource which needs to be used efficiently and effectively. 2. As per below chart, WRC-19 identified a total of 17.25 GHz bandwidth for IMT above 24 GHz and only a handful of countries have used it for 5G as of today. Korea, who had initially planned to deploy in the mmW band has now cancelled the licenses in 28GHz. 3. In addition to spectrum identified for IMT at WRC-19, the current WRC-23 study cycle through some WRC-23 Agenda Items (i.e., Agenda Items 1.1 and 1.2) are considering additional spectrum that could be potentially identified for IMT. 4. Justification and user requirements for additional IMT spectrum for dense urban applications must be clarified => 6G mobile systems are still in research phase. This is especially the case when satellite operators struggle to accommodate the growing services demand in core FSS MSS & BSS bands operating in these ranges 5. Co-frequency sharing with such satellite deployments and IMT services would be extremely difficult and risk the interruption of satellite services in the band

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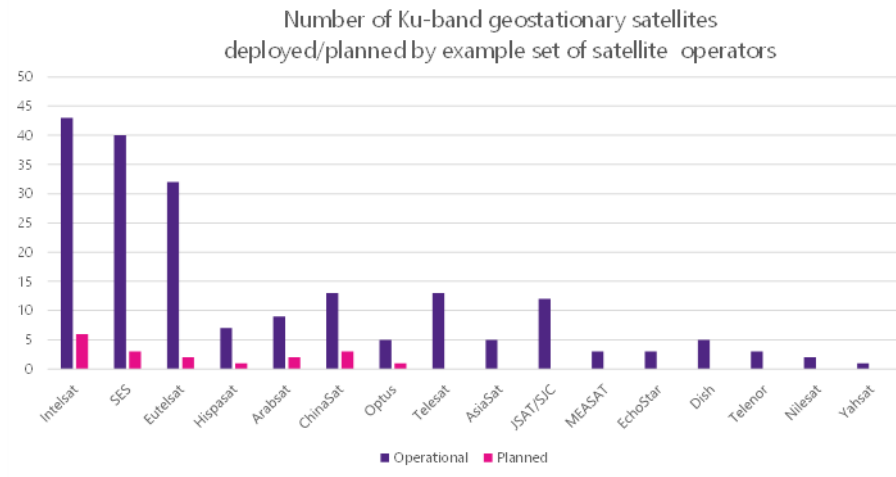
As shown in the figure below – representing the Radio Regulations Article 5 – the frequency range 7-24 GHz is allocated to 16 types of radio services which often share the same spectrum. In addition to being very congested, parts of the range are used for critical strategic applications, such as radiolocation and security services. Therefore, the frequency range does not allow for large system bandwidths for IMT services. This is one of the main reasons why it has been decided not to study this range for IMT during WRC-15.



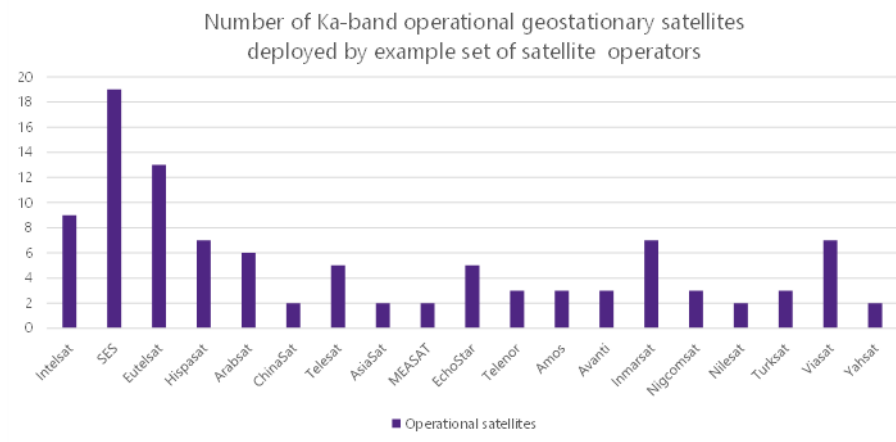
Since 2015, thousands more LEOs and new High Throughput Satellite (HTS), Very High Throughput Satellite (VHTS) and Software Defined Satellite (SDS) GSO satellites using Ku & Ka bands came into service and there are several Agenda Items in WRC-23 - ISL, ESIMs – seeking possible additional efficient usage for satellite on those bands as shown by the figure below.

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Ku-band allocations are globally harmonised for satellite uplink and downlink use for decades and include planned services described in ITU RR Appendices 30/30A/30B where ITU member states are provided with guaranteed access to orbital slots to be used when required.



Since the 7-24 GHz are core and vital frequency bands for the satellite telecommunications sector with existing and already committed investments by the satellite industry of over US \$20 billion in over a 100 Ku/Ka-band GEO satellites and thousands of Ku/Ka-band Non-GSO satellites operating in the 7-24 GHz range which provide vital and valuable services to 100s of millions of consumers / customers globally.

Based on the above facts, GSOA strongly opposes the study proposal to seek an additional spectrum for IMT within the 7-24 GHz range to be considered under AI10 for WRC-27.

Agenda Item	Comments and Views on Proposed Malaysia's Positions																				
10	<p>Study Proposal to review FSS sharing conditions in the band 13.75–14 GHz</p> <p>GSOA recommends MCMC to support the inclusion of study proposal to review the sharing conditions of 13.75-14 GHz to enable efficient use of the band by FSS earth stations as an agenda item for WRC-27 study cycle. Such study proposal has been supported by at least 6 APT Members through individual input paper submissions to the last APG23-5 meeting.</p> <p>Below are some justifications on the need to conduct such ITU-R study proposal:</p> <ol style="list-style-type: none"> 1) Table-1 below indicated that there is a significant mismatch between the uplink and downlink bandwidth which could be used to provide services for smaller antennas starting from 250 MHz up to 550 MHz of spectrum. <table border="1" data-bbox="321 871 1425 1262"> <thead> <tr> <th data-bbox="321 871 592 997"></th> <th colspan="3" data-bbox="592 871 1425 997">Bandwidth (MHz) in the 10-15 GHz range, not subject to RR Appendices 30, 30A or 30B, that can be used by smaller antennas</th> </tr> <tr> <th data-bbox="321 997 592 1087"></th> <th data-bbox="592 997 797 1087">Downlink</th> <th data-bbox="797 997 966 1087">Uplink</th> <th data-bbox="966 997 1425 1087">Lack of uplink bandwidth to feed downlink bandwidth</th> </tr> </thead> <tbody> <tr> <td data-bbox="321 1087 592 1146">Region 1</td> <td data-bbox="592 1087 797 1146">750 (1000)</td> <td data-bbox="797 1087 966 1146">500</td> <td data-bbox="966 1087 1425 1146">250(500)</td> </tr> <tr> <td data-bbox="321 1146 592 1205">Region 2</td> <td data-bbox="592 1146 797 1205">1000</td> <td data-bbox="797 1146 966 1205">500</td> <td data-bbox="966 1146 1425 1205">500</td> </tr> <tr> <td data-bbox="321 1205 592 1262">Region 3</td> <td data-bbox="592 1205 797 1262">1050</td> <td data-bbox="797 1205 966 1262">500</td> <td data-bbox="966 1205 1425 1262">550</td> </tr> </tbody> </table> <p>Table 1: Ku-band [frequency bands] for smaller antennas in FSS, not subject to Appendix 30, 30A or 30B</p> <ol style="list-style-type: none"> 2) The review and considerations on the limitations introduced in RR Nos. 5.502 and 5.503 to enhance compatibility with radiolocation, radionavigation services and geostationary space stations in the space research service were made 20-30 years ago at a time GSO and NGSO FSS satellites and their associated applications and requirements were very different from today. 		Bandwidth (MHz) in the 10-15 GHz range, not subject to RR Appendices 30, 30A or 30B, that can be used by smaller antennas				Downlink	Uplink	Lack of uplink bandwidth to feed downlink bandwidth	Region 1	750 (1000)	500	250(500)	Region 2	1000	500	500	Region 3	1050	500	550
	Bandwidth (MHz) in the 10-15 GHz range, not subject to RR Appendices 30, 30A or 30B, that can be used by smaller antennas																				
	Downlink	Uplink	Lack of uplink bandwidth to feed downlink bandwidth																		
Region 1	750 (1000)	500	250(500)																		
Region 2	1000	500	500																		
Region 3	1050	500	550																		
10	<p>Study Proposal to review the use of 51.4-52.4 GHz for non-GSO FSS</p> <p>GSOA supports the inclusion of the agenda item 10 proposal for Studies relating to the use of the 51.4 – 52.4 GHz band by gateway earth stations transmitting to non-geostationary orbit FSS satellite systems (Earth-to-space). The need for additional FSS spectrum in the 50 GHz range for non-GSO FSS gateway uplinks was established in partial response to Agenda Item 9.1.9 for WRC-19 in Report ITU-R S.2461. These studies included</p>																				

Agenda Item	Comments and Views on Proposed Malaysia's Positions
	<p>the need for spectrum for both non-GSO systems and GSO FSS networks. Spectrum for GSO networks was allocated by WRC-19 to GSO feeder links, but not for non-GSO. This allocation would provide spectrum for non-GSO FSS systems to enable additional broadband connectivity.</p>
<p>10</p>	<p>Study Proposal for GSO and non-GSO ESIM in Q/V bands</p> <p>GSOA recommends the MCMC to support inclusion of WRC-27 preliminary agenda item 2.2 (GSO FSS A-ESIM and M-ESIM in Q/V bands) in the WRC-27 agenda and extension of its scope to cover both GSO FSS networks and non-GSO FSS systems (LEO, MEO) in order to respond to steep increase in the required capacity for in-flight and maritime connectivity. While the associated Resolution 176 (WRC-19) was developed for GSO only, enhancements in antenna and terminal technology have enabled the usage of these frequency bands by both GSO FSS networks and non-GSO FSS systems. Non-GSO satellite constellations in these frequency bands enable the provision of broadband connectivity for a variety of enhanced applications, regardless of location.</p>
<p>10</p>	<p>Study proposal to review the need for additional MSS below 5 GHz</p> <p>GSOA recommends that MCMC suppress WRC-27 preliminary agenda item 2.13 (see Resolution 812 (WRC-19)) and support an entirely new future agenda item to allocate additional spectrum to MSS to address the increasing demand for mobile satellite applications (and satellite mobility generally) especially those envisaged in Report ITU-R M.2514 "Vision, requirements and evaluation guidelines for satellite radio interface(s) of IMT-2020", direct-to-device connectivity and to avoid spectrum shortfall and crowding in lower bands. MSS can provide coverage to underserved and remote areas, support evolving technologies, and facilitate the integration of satellite and terrestrial networks.</p>