GLOBAL SATELLITE COALITION

Global Satellite Industry Positions

on Key Agenda Items for WRC19

www.gscoalition.org

info@gscoalition.org

GLOBAL SATELLITE COALITION

Agenda Item
1.13
24.25-27.5 GHz

WRC-19 Agenda Item 1.13: IMT & Satellite in the 26 GHz Band (24.25-27.5 GHz)

Overview: **WRC-19 Agenda item 1.13** considers the possibility of identifying a staggering 33 GHz of spectrum for IMT between 24.25 GHz and 86 GHz. This document addresses portions of these bands – 24.65-24.75 GHz (Regions 1 and Regions 3, subject to 5.532B), 24.75-25.25 GHz (Global) and 27-27.5 GHz (Regions 2 and 3) ("**the 26 GHz band**") – that are allocated to satellite services in the uplink direction (Earth-to-space). Satellite operations for important gateway links already exist in these bands, and future satellite system gateway operations are planned to enhance connectivity. As this spectrum is generally planned for use by gateway FSS earth stations, it is feasible to share with terrestrial services. With reasonable protections to ensure ongoing viable gateway earth station access in these bands, IMT can be accommodated in the 26 GHz band.

Background and ITU-R Studies: ITU-R studies have been carried out to assess the feasibility of accommodating IMT in various frequency bands and how to ensure compatibility with existing services. The 24.65/24.75-25.25 GHz band is used by individually licensed earth stations for feeder links and other FSS uses. Notably, footnote 5.532B limits the use of the band 24.65-25.25 GHz in Region 1 and the band 24.65-24.75 GHz in Region 3 to earth stations using a minimum antenna diameter of 4.5 m. The 27-27.5 GHz band is generally used for gateway earth stations to support broadband connectivity and other FSS uses in ITU Regions 2 and 3. Due to the inherent nature of gateway facilities, the number of earth stations deployed in this band is expected to be limited.

As this spectrum is generally planned for use by gateway FSS earth stations, it is feasible to share with terrestrial services, but only if measures are adopted to allow for the continued and future deployment of the FSS services. As a result, if WRC-19 makes an IMT identification, it is important to include provisions to facilitate compatibility with existing and future satellite services.

Two scenarios must be addressed: (1) protection of reception at the satellite from aggregate interference from numerous IMT transmitters deployed on the territories of countries within the satellite coverage area; and (2) continued access for FSS gateway earth stations that could be coordinated with IMT operations. Interference into satellite receivers generated by IMT networks deployed in different countries within the satellite coverage area cannot be managed through national regulation.

The GSC recommends that if an IMT identification in the 26 GHz band is made, specific provisions in the Radio Regulations must be adopted to protect FSS uplink satellite receivers and to enable viable, sustained access by existing and future FSS gateway earth stations, as detailed below. Such an approach will enable both IMT and FSS gateways.

Specifically, we recommend that any method to identify IMT in these frequency bands include:

- Power and pointing limitations on IMT base stations to protect FSS satellite receivers, that do not put undue constraints on IMT.
- Assistance to administrations in defining measures for future FSS earth station deployment.

These measures are contained in the CPM Report as:

- Condition A2e Option 3 with a level of 37 dBm/200 MHz (protecting FSS receiving satellites). Note that this power level is significantly higher (12 dB) than that put forward by IMT proponents in the ITU studies, and thus not constraining on IMT deployments; and
- Condition A2d Option 1 (allowing future FSS earth station deployment) in Method A2.

GLOBAL SATELLITE COALITION

Agenda Item
1.13
40/50GHz

WRC-19 Agenda Item 1.13: IMT & Satellite User Terminals in the 40/50 GHz range

Overview: **WRC-19 Agenda item 1.13** WRC-19 Agenda item 1.13 calls for sharing and compatibility studies for a possible identification to IMT in more than 33 GHz of spectrum between 24 and 86 GHz. This document addresses the following bands: From the 33.25 GHz considered, only 4 GHz are identified for high density deployment of user terminals (HDFSS) in Region 2 and similar amounts of spectrum in Regions 1 and 3 are planned for ubiquitous satellite terminal deployments. GSC recommends that this core satellite spectrum for ubiquitous earth station deployment (40-42 GHz and 48.2-50.2 GHz in Region 2, 37-40.5 GHz in Regions 1 and 3 for FSS and FS) not be identified for IMT.

The remaining FSS spectrum is utilized by lower density applications in the FSS, i.e., gateways earth stations for which station locations are generally knowable in advance. The known locations and station characteristics of such gateway FSS earth stations and IMT base stations may allow for sharing under certain conditions. GSC believes that the 37-40 GHz frequency bands may be identified for IMT in ITU Region 2, subject to the adoption of power and pointing limitations for IMT base stations (that do not put undue constraints on IMT) in FSS uplink bands, as well as provisions for ensuring continued, viable access by gateway FSS earth stations to use these frequency bands.

Similarly, the 40.5-43.5 GHz bands in Regions 1 and 3 could be identified for IMT with similar conditions to enable sharing with the FSS. This will provide IMT access to substantial spectrum in each Region in the broader 37-43.5 GHz frequency range, allowing both terrestrial and satellite broadband services to play a crucial role in providing access to businesses and consumers worldwide and be critical components of 5G networks.

Background and ITU-R Studies: Broadband satellite systems require access to unencumbered spectrum to operate widely deployed transmitting and receiving user terminals. To satisfy this minimum requirement, footnote 5.516B of the Radio Regulations (RR) identifies the bands 48.2-50.2 GHz (Earth-to-space) and 40-42 GHz (space-to-Earth) for high-density fixed satellite service (HDFSS) operations in Region 2 (see Resolution 143 (Rev. WRC-07)). Satellite networks are under construction for these bands. In other regions, a core amount of HDFSS spectrum is identified in this footnote, but it is left to administrations to determine which additional bands should be used in their countries to provide ubiquitous broadband satellite services. GSC believes that parts of the 37-40.5 GHz band should similarly be reserved for ubiquitous earth station deployments in Regions 1 and 3.

To provide satellite broadband services directly to ubiquitously deployed end users, these advanced satellite systems require flexible, rapid and unrestricted deployment of large numbers of cost-optimized earth stations employing small antennas. The identification of bands for ubiquitous earth station deployment facilitates the implementation of such broadband services and maximizes global access and economies of scale.

ITU-R studies demonstrated that co-existence between the IMT and FSS is feasible in the case of FSS earth stations at specified locations, assuming the systems operate in accordance with the studied parameters. In the case where small FSS earth stations are to be deployed at unspecified locations, however, co-existence could not be ensured between both services. Therefore, co-frequency operations of FSS user terminals and other ubiquitous terrestrial services in the same geographical area cannot be considered feasible at this time.

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The other spectrum in the 37-43.5 GHz band (i.e. 40.5-43.5 GHz in Regions 1 and 3, and 37-40 GHz in Region 2) provides wide bandwidths that are particularly valuable to satellite systems requiring large amounts of spectrum to support broadband connectivity. As this spectrum is generally planned for use by individually licensed FSS earth stations, it is feasible to share with terrestrial services, but only if measures are adopted to allow for the continued and future deployment of the FSS services. As a result, if WRC-19 makes an IMT identification in these bands, it is important to include provisions to facilitate compatibility with existing and future satellite services. Two scenarios must be addressed: (1) protection of reception at the satellite from aggregate interference from numerous IMT transmitters deployed on the territories of countries within the satellite coverage area; and (2) continued access for FSS earth stations that might cause interference to or receive interference from nearby IMT deployments.

The GSC recommends that WRC-19 adopt a balanced solution for the identification of IMT in the 40/50 GHz bands.

- In Region 2, the Conference should not identify for IMT the spectrum identified for HDFSS (40-42 GHz and 48.2-50.2 GHz), as per Methods C1, D1, & H1 in the CPM Report. GSC supports an identification for IMT in the 37-40 GHz band.
- In Regions 1 and 3, GSC supports identification for IMT in the 40.5-43.5 GHz band, and No Change to the Radio Regulations in the 37-40.5 GHz band to preserve spectrum for other services such as HDFSS and FS.

Protection measures for FSS in sub-bands proposed for IMT identification:

Appropriate parts of spectrum allocated to the FSS could be identified for IMT on a shared basis with the FSS, with suitable conditions to ensure compatibility. Specifically, we recommend that any method to identify IMT in the 37-40 GHz (Region 2) and 40.5-43.5 GHz (Regions 1 and 3) frequency bands include:

- Power and pointing limitations on IMT base stations to protect FSS satellite receivers, that do not put undue constraints on IMT.
- Assistance to administrations in defining measures for future FSS earth station deployment, including required separation distances.

Methods and Options for the protection of FSS in sub-bands proposed for IMT identification:

For the 37-40 GHz (R2 – Band C) band, these measures are contained in Method C2 of the CPM text, Draft New Resolution [B113-IMT 40/50 GHz] (WRC-19) and Condition C2b Option 1 (allowing future FSS earth station deployments).

For the 40.5-42.5 GHz (R1/R3 – Band D) band, these measures are contained in Method D2 of the CPM text, Draft New Resolution [B113-IMT 40/50 GHz] (WRC-19) and Condition D2a Option 1 (allowing future FSS earth station deployments).

For the 42.5-43.5 GHz (R1/R3 – _Band E) band these measures are contained in Method E2 of the CPM text, Draft New Resolution [B113-IMT 40/50 GHz] (WRC-19), Condition E2a Option 2 with a level of 37 dBm/200 MHz (protecting FSS receiving satellites) (note that this power level is significantly higher than that put forward by IMT proponents in the ITU studies, and thus not constraining on IMT deployments) and Condition E2d Option 1(allowing future FSS earth station deployment).

In the bands 45.5 –47.0 GHz (band F) and 47.0-47.2 GHz (band G) for which no studies were conducted in TG5/1, no change to the RR is recommended (Methods F1 and & G1).

In the bands 47.2 –50.2 GHz (band H) and 50.4-52.6 GHz (band I) no change to the RR is recommended, since already large amounts of spectrum are supported for IMT identification in the bands 24.25-27.5 GHz globally, 40.5-43.5 GHz in R1 and R3 and 37-40 GHz in R2, and 66-71 GHz globally.

If however an IMT identification were to be considered by WRC-19 in the 47.2-48.2 GHz band (band H) or 50.4-52.6 GHz (band I), measures similar to the ones for 42.5-43.5 GHz band, as described above, should be adopted.

In summary, if an IMT identification is to be proposed to WRC-19 in the 40/50 GHz band, this should only be made with a clear requirement this would not provide a barrier/deterrent to the FSS

GLOBAL SATELLITE COALITION

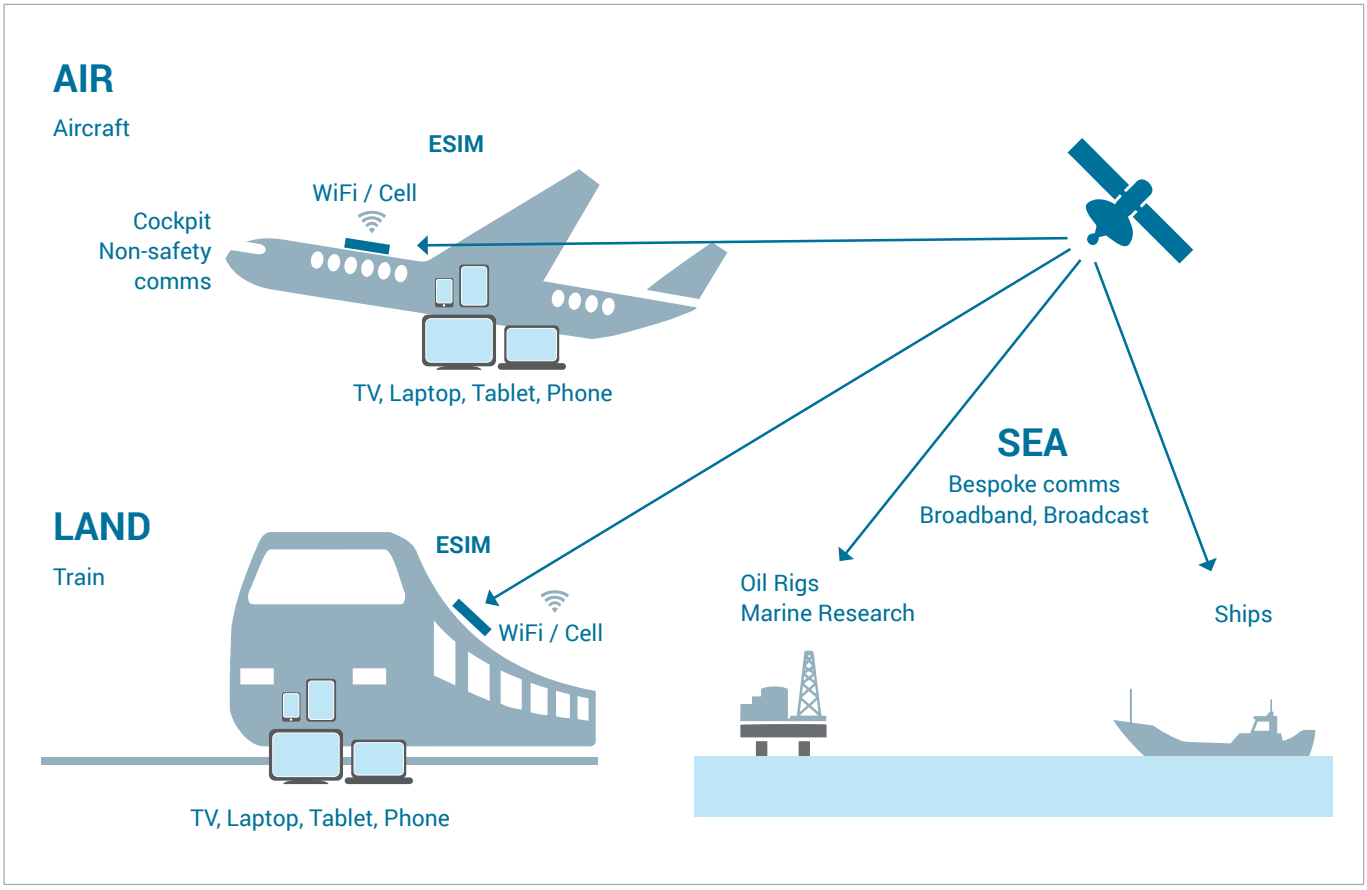
Agenda Item
1.5

WRC-19 Agenda item 1.5: Mobile Broadband via Ka-Band Satellites

Overview: **WRC-19 Agenda item 1.5** considers the use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion (ESIMs) communicating with geostationary satellite orbit (GSO) FSS space stations.

This agenda item builds on the provisions adopted at WRC-15 for the operation of ESIMs communicating with GSO FSS space stations in the 29.5-30 GHz and 19.7-20.2 GHz bands. Adopting provisions for ESIMs also in 27.5-29.5 GHz and 17.7-19.7 GHz bands is necessary to support the rapid growth in demand for broadband communications from the global average of 67 million people on the move in the air, at sea, and over land at any time. The GSC therefore supports a regulatory environment that recognizes the ability of ESIMs to safely operate within GSO FSS networks, without causing interference to other services, on all of the spectrum they currently use through adoption of the solution developed as Method B in the CPM Report.

Background and ITU-R Studies: ITU-R studies have identified ways for ESIMs to operate compatibly with other services (both space and terrestrial) and have also led to example guidelines to assist administrations wishing to authorize ESIMs on their territories. The following diagram shows how ESIMs expand the traditional FSS applications by providing truly broadband services to mobile platforms.



1 The global population in transit is equivalent to the world's 21st largest country, the UK.

Some of the key aspects are:

- Use of ESIMs with a GSO FSS network would not change the sharing environment with other GSO FSS networks, as ESIMs would operate within the same technical envelope as existing GSO FSS networks.
- For the 17.7-19.7 GHz band (i.e. the ESIM receive band), use of ESIMs would not impact the sharing with other services (space or terrestrial) as ESIMs will not claim additional protection and there would be no change to the transmission parameters from the GSO FSS satellite to serve ESIMs.
- For the 27.5-29.5 GHz band (i.e. the ESIM transmit band), means to protect other services have been identified, with options included on some aspects in the CPM Report. The GSC supports the following:
  - To address compatibility with NGSO FSS systems in frequency bands where there is no coordination requirement, off-axis e.i.r.p. density limits for ESIMs are contained in Annex 1 of the draft WRC Resolution with an optional on-axis e.i.r.p. limit. Compatibility with NGSO FSS in other bands, and with NGSO MSS feeder links, would be addressed through normal satellite coordination.
  - When aeronautical ESIMs are operating within line-of-sight of the territory of an administration within which terrestrial services are operating on a co-frequency basis, the ESIM should comply with the Option 1 power flux density (pfd) limits on the Earth's surface contained in Annex 2 Part 2 of the draft WRC Resolution. The "Option 1" pfd mask is supported by most administrations. The alternative pfd masks proposed would over constrain ESIMs and would over-protect terrestrial services. An altitude limit is unnecessary, as the pfd limit provides adequate protection irrespective of the aircraft altitude. Higher pfd levels than those provided in "Option 1" within an administration produced by aeronautical ESIM on the surface of the Earth above shall be subject to the prior agreement of that administration.
  - For maritime ESIM, operations within any portion of the 27.5-29.5 GHz frequency band used for terrestrial services within a given coastal State and within 70 km from shore would be subject to the prior agreement of that coastal State (similar as for maritime vessels operating in FSS C- and Ku bands). This distance is supported by all six Regional organizations and the GSC. The maximum e.i.r.p. spectral density towards the horizon of any coastal State should be limited to 24.44 dB(W/14 MHz) within band segments where co-frequency terrestrial services are operating. This is the value included in the CPM Report, scaled up to a 14 MHz reference bandwidth. This reference bandwidth is appropriate since it is the smallest of the reference bandwidths of the fixed and mobile services used in the ITU-R studies. - For land ESIMs, administrations can address compatibility with other services domestically and through bi-lateral agreements with neighbouring administrations.

The GSC recommends that Method B with the above referenced Options in the CPM text be adopted by WRC-19. This regulatory solution support the rapidly growing demand from travellers for broadband connectivity on the move in air, at sea and over land, and results in rational and efficient use of the radio spectrum resource. Existing services will be protected from possible interference.

Note: Iridium does not support the GSC position on ESIM use of 19.4-19.6 GHz and 29.1-29.3 GHz.

GLOBAL SATELLITE COALITION

28/18 GHz

Global Satellite Coalition Position: 28/18 GHz Band (27.5-29.5/17.7-19.7 GHz)[1]

Overview: Today, Ka-band satellites provide broadband connectivity to cities, suburban areas and to those that otherwise would not have it, and offer a competitive alternative to terrestrial broadband choices. Satellite-delivered broadband service is a success story made possible by decades of decisions to safeguard satellite's unique role in the broadband revolution by providing satellite access to the Ka-band portion of the radio spectrum. Based on Ka-band spectrum access certainty, the satellite industry has invested in and deployed into orbit over one hundred commercial Ka-band satellites, with many more in development and construction, set for launches soon. In some cases, satellite broadband networks may be the only way of affordably connecting many economically challenged people in both urban and rural areas. The 28/18 GHz portion of the Ka band is part of the core satellite spectrum used today to deliver broadband globally and its deployment and use are expanding rapidly.

Even as satellite networks are increasingly providing critical services with ubiquitous coverage using the 28/18 GHz bands, the terrestrial wireless industry is seeking to repurpose the 28 GHz portion of that spectrum for future terrestrial 5G/IMT networks, despite the availability of other, more appropriate, spectrum. If governments bypass the international process, and restrict or relocate satellite use from all or part of the Ka band, in favor of 5G/IMT, this will only increase the digital divide.

Momentum is with the Satellite Industry in the 28/18 GHz Bands

The good news is that global momentum is for expanded satellite use of the Ka band for fixed and mobile satellite broadband services worldwide, not for 5G/IMT.

Most countries are following the WRC-15 decision and oppose introducing 5G/IMT in the Ka band. For example, the European Commission for Posts and Telecom (CEPT) Roadmap for 5G/IMT, covering 48 members states, provides that this spectrum is for satellite broadband, including aeronautical connectivity, and not for 5G/IMT. RCC has expressed strong support for continued satellite broadband use of this spectrum (and not 5G/IMT). China has also been staunchly against 5G/IMT in the Ka band, urging the international community to protect it for satellite broadband. In addition, major markets such as India, Brazil, Indonesia, and Australia have recognized the importance of preserving the Ka band for existing satellite broadband services. In addition, African countries, represented by their main sub-regional groups, support expanding satellite use of the Ka band. Moreover, the Arab Spectrum Management Group (ASMG) has recently reiterated its position of "No Support" for introducing 5G/IMT in the Ka band. Most recently, the Mexican government has confirmed that most countries in the Americas region, including Mexico, are maintaining the current spectrum policy on the Ka band, and are protecting and maintaining it exclusively for satellite services. In a recently concluded consultation on the 28 Ghz band Australia did the same. Australia decided that there was sufficient spectrum for 5G/IMT mobile services in the 26 GHz band and, therefore, assigned the 28 GHz band for satellite broadband services, including ESIM.

With some 4.3 billion people represented by China, Europe, Brazil, Indonesia, India, Nigeria and Mexico alone (who support preserving the Ka band for satellite and not adopting it for 5G/IMT), it is apparent that the necessary economies of scale would not develop for successful 5G/IMT use of the Ka band. All told, the number of countries supporting satellite use of the Ka band is over 120, and growing.

1 The 28 GHz band is paired with the 18 GHz band.

Satellite Broadband Use of the 28/18 GHz Bands is Expanding Around the Globe

Reopening the debate on the 28 GHz band would ignore a decision at the 2015 ITU World Radiocommunication Conference (WRC-15) where world governments resoundingly:

- **Declined to consider studying the introduction of terrestrial 5G in the 28 GHz band;**
- **Reaffirmed the critical need for satellite communications in the 28 GHz band; and**
- **Further proposed expanding use of the 28 GHz band for satellite broadband service to airplanes, buses, trucks, trains, cars and ships – i.e. Earth Stations in Motion (ESIMs).**

What led countries at WRC-15 to study expanded satellite broadband use of the 28 GHz band to bridge the digital divide remains true today, as satellite broadband continues to expand its ability to provide broadband service to users across the globe, no matter their locations. In recognition of this, the CEPT has taken a position in its 5G Roadmap to set aside the 28 GHz band for satellite broadband and state clearly that 'this band is therefore not available for 5G'.

As a result of the consistent, longstanding regulatory decision to make the 28 GHz band available for use by satellite networks and its paired 18 GHz band, the satellite industry has invested tens of billions of dollars in satellites and other critical infrastructure that rely on the 28/18 GHz band. These include launch and manufacturing facilities, Internet gateways and other ground infrastructure, and the devices that connect residential and mobile consumers, businesses, and government users worldwide. Because of that investment, hundreds of millions of satellite broadband connections now help citizens build nations and societies, as well as support countless high paying jobs and increase national GDPs.

The GSC recommends that administrations ensure that satellite networks have full access to the spectrum and operational flexibility in the 28/18 GHz band spectrum to provide ubiquitous fixed and mobile satellite broadband services, as these satellite operations are key to narrowing the digital divide. In addition, administrations should not identify the band for terrestrial 5G on a national or international basis, as studies have shown that terrestrial 5G is incompatible with satellite services in the same band. Moreover, there are vast amounts of spectrum already available or expected to be made available for terrestrial IMT/5G in low, mid, and high bands, outside the 28/18 GHz bands. The 28/18 GHz bands must continue to be made available for satellite broadband use. This frequency band supports satellite networks that provide critical broadband connectivity across the globe and are key enablers to meet the United Nations' broadband Sustainable Development Goals and its Broadband Commission for Sustainable Development's "Targets 2025", which support "Connecting the Other Half" of the world's population.[2]

2 https://www.broadbandcommission.org/about/Pages/default.aspx

GLOBAL SATELLITE COALITION

Agenda Item 9.1 Issue 9.1.7

Agenda Item 9.1, Issue 9.1.7: Unauthorised earth stations

Overview WRC-19 Agenda Item 9.1 Issue 9.1.7:

9.1 on the activities of the Radiocommunication Sector since WRC-15; Issue 9.1.7: Issue 2) in the Annex to Resolution 958 (WRC 15) studies to examine:

a) whether there is a need for possible additional measures in order to limit uplink transmissions of terminals to those authorized terminals in accordance with No **18.1**;

b) the possible methods that will assist administrations in managing the unauthorized operation of earth station terminals deployed within its territory, as a tool to guide their national spectrum management programme, in accordance with Resolution ITU R 64 **(RA 15)**.

With respect to Issue 2a) in the Annex of Resolution **958 (WRC-15)** the CPM text includes two options.

- **Option 1** no change to the Radio Regulations is required as current measures, specifically the provisions of Article 18, contain a clear and unambiguous requirement to operate an earth station only if duly authorized.
- **Option 2** introduces a new WRC Resolution to assist administrations with the application of RR No. **18.1**.

Background and ITU-R Studies:

The GSC is of the view that new provisions in the Radio Regulations will not help address unlawfully operated earth stations since international regulatory measures stated in the RR **Article 18** sufficiently address the issue of an unauthorized earth station in the Fixed Satellite Service.

However, the GSC recognizes the concerns of administrations affected by unauthorized operation of earth station terminals. For example, the challenges being experienced by some administrations with respect to unauthorised uplink transmissions of earth station terminals include, the Administrations lack of monitoring capabilities and their inability to detect unauthorised earth stations.

However, the GSC recognizes the concerns of administrations affected by unauthorized operation of earth station terminals by service providers and further clarification is needed on the principle that the operation of earth stations within the territory under the jurisdiction of an administration shall be carried out only if authorized by that administration, the obligation of **Article 18**, and the possible measures to resolve the transmissions from unauthorized earth station when they accidentally occur and consequently to eliminate the number of such transmissions.

ITU reports, along with training and monitoring capabilities, can assist national administrations in inhibiting the use of unauthorized uplink earth terminals and to enable national administrations to locate and terminate the unauthorized transmissions. So with respect to Issue 2b) in the Annex of Resolution **958 (WRC-15)**, the single option in the CPM text aims to provide necessary guidelines on satellite monitoring capabilities, along with possible revision and/or further development of ITU-R Reports or Handbooks to assist administrations with managing unauthorized operation of earth stations deployed within their territory, as a tool to guide their national spectrum management.

By way of an example on how such guidelines can be developed within the framework of ITU-R, there is ongoing work in ITU-R WP1C on the Recommendation ITU-R SM.[APP10] on guidelines for administrations which encounter instances of harmful interference. The recommendation aims to supplement the format prescribed in Appendix 10

of the Radio Regulations to facilitate cooperation and exchange of information among multiple parties, including the administrations involved, the space monitoring facility, and the ITU Radiocommunication Bureau. Similar guidelines for interference detection and resolution in case of the Earth Exploration-Satellite Service (passive) sensors can be found in Recommendation ITU-R RS.2106.

Other examples include ITU-R Report SM.2424 on "Measurement techniques and new technologies for satellite monitoring" developed by WP1C and approved by Study Group 1 in 2018, or the preliminary draft revision of Recommendation ITU-R SM.1392-2 on "Essential requirements for a spectrum monitoring system for developing countries".

The GSC believe that such examples are relevant in order to develop guidelines to facilitate cooperation between administrations, the space monitoring facility, and the ITU Radiocommunication Bureau in ITU-R for the case where unauthorized operation of earth station terminals is detected by an administration.

Such guidelines would assist administrations in managing (identifying and geo-locating) the unauthorized operation of earth station terminals and successfully, notify, and resolve any unauthorized operation deployed within their territory in cooperation with all relevant parties.

GSC position: Recognizing the concerns of administrations affected by unauthorized operation of earth station terminals, **the GSC recommends** supporting the following methods to satisfy issue 9.1.7:

Issue 2a: Option 1: no change to the Radio Regulations as current measures are sufficient. The Radio Regulations, specifically the provisions of **Article 18**, contain a clear and unambiguous requirement to operate an earth station only if duly authorized. New provisions in the Radio Regulations will not help address unlawfully operated earth stations.

Issue 2b: to provide necessary guidelines on satellite monitoring capabilities, along with possible revision and/or further development of ITU-R reports or handbooks to assist administrations with managing unauthorized operation of earth station terminals deployed within their territory, as a tool to guide their national spectrum management.

GLOBAL SATELLITE COALITION

Agenda Item
9.1
Issue 9.1.9

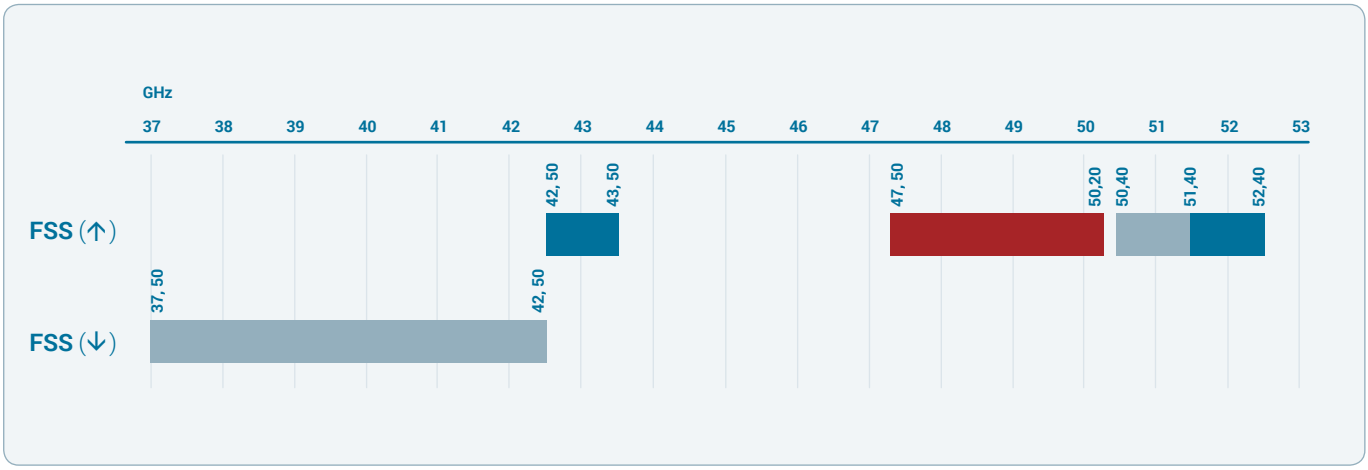
Agenda Item 9.1, Issue 9.1.9: New FSS allocation at 51.4-52.4 GHz

Overview: Under Agenda item 9.1, Issue 9.1.9, Resolution 162 (WRC-15) calls for studies on spectrum requirements and the possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (FSS) (Earth-to-space). For satellite systems to deliver broadband services with high data rates to accommodate user demand, substantial forward link spectrum is needed (i.e., gateway uplinks and user terminal downlinks). As a result, GSC supports allocation of 51.4-52.4 GHz to FSS in the uplink direction to support this gateway requirement.

Background and ITU-R Studies: Satellite systems are increasingly being used to deliver broadband services with high data rates to accommodate user demand and service expectations worldwide. Next-generation satellite networks are expected to be able to provide data rate services of greater than 1 Gbit/s on a single channel to users regardless of location.

Current HTS systems are mainly operated in Ka-band and use the Earth-to-space allocations for both user links and gateway links. The hundreds of currently operating Ka-band satellite networks lead to the current scarcity of spectral resources in this frequency band. In order to increase the capacity of HTS systems and improve the services provided to end-users, it is proposed to expand the FSS (Earth-to-space) allocation in the 50 GHz frequency band for gateway uplinks (from gateway to space station) in order to facilitate freeing up the Ka-band FSS (Earth-to-space) allocation for user uplinks (from user terminals to space station). Therefore, the consideration of new primary allocations to the FSS in the frequency band 51.4-52.4 GHz (Earth-to-space) could help in that perspective.

The following figure shows the current primary allocations to the unplanned FSS Earth-to-space and space-to-Earth. The segment under study for a new FSS allocation is also shown, indicating how this new allocation would create an asymmetry to increase uplink spectrum.



In preparation for WRC-19, WP 4A developed two Reports; one on spectrum needs for development of the FSS and the second one on sharing and compatibility between FSS and existing services.

As indicated in the CPM Report, the spectrum needs were analyzed, and it was concluded that the additional allocation to the FSS being considered is beneficial to make broadband connections provided by HTS systems more widely accessible.

Additionally, the outcome of the studies has demonstrated the possibility of sharing and compatibility with the appropriate protection measures.

Based on results from studies, the additional allocation in frequency band 51.4-52.4 GHz to the FSS fixed-satellite service (Earth to space), limited to FSS gateway links for geostationary orbit use could be done ensuring adequate protection to existing radio services in - and in adjacent band such as:

- Appropriate separation distances between FSS earth stations and FS, IMT 2020 base stations and Radio astronomy observation stations would ensure adequate protection of incumbent services ;
- Appropriate unwanted emission limitations applicable to FSS earth stations are able to ensure due protection of NGSO EESS system operating in the adjacent band (52.6-54.25 GHz);
- The protection of future GSO EESS (passive) sensors could be ensured by angular separations between GSO FSS and GSO EESS (passive) satellites in the order of 0.0-3.2 degrees. Two options are now included in CPM text to address this issue:
  - **Option 1:** Ensuring a sufficient angular separation in the GSO arc between the FSS and the EESS (passive) space stations depending on the FSS ES unwanted emission levels (coordination on case by case basis).
  - **Option 2:** Giving priority to a limited number of orbital positions (predefined in the option) in the GSO arc for the operation of GSO EESS (passive) sensors. The GSO FSS networks with space stations located at less than 3.2 degrees separation of such positions should adjust the unwanted emission levels from earth stations to protect the EESS (passive) sensors on board the GSO satellite.

The GSC recommends that WRC-19 add an allocation to the FSS in the 51.4-52.4 GHz band (Earth to space), limited to FSS gateway links for geostationary orbit use, and establish the required regulatory measures to protect co-primary services and services in adjacent bands.

GLOBAL SATELLITE COALITION

Agenda Item 10

Agenda Item 10: Views on proposals for WRC-2023 Agenda Items

GSC members have worked closely with administrations and other stakeholders at ITU-R and regional levels to allow co-existence and future development of radio-communication services. The GSC relies on the balanced support of administrations for the development of all telecommunications sectors, by providing the regulatory certainty required for continued operations and future sustainable investment.

Resolution 238 required WRC-19 to study up to 33.25 GHz for potential idenitification to IMT-2020 under Agenda Item 1.13. With IMT-2020 technology still in development and demand for nascent 5G services uncertain, the plentiful existing spectrum already available for IMT should be used before more spectrum is identified for IMT. With IMT-2020 deployment in these bands targeting mainly densely populated areas with traffic hotspots and with wireless devices increasingly operating in license exempt spectrum, it is unclear how much additional spectrum will be required, if any, beyond that currently identified or to be identified through WRC-19 Agenda Item 1.13. Furthermore, as demonstrated by a study performed by LS Telcom, a significant amount of spectrum harmonized for IMT in the bands below 3 GHz has not yet been licensed or used by IMT[1].

Despite the uncertainties regarding IMT-2020 technologies and 5G demand, and the **significant** amount of unlicensed or unused spectrum **already** identified for IMT, the mobile community is proposing that studies be conducted to identify **even more spectrum** for IMT at WRC-23. There is no consensus among regions on whether additional spectrum is needed for IMT at all, much less which bands are most appropriate. Current proposals are wide and vary in proposing bands from 3 to 24 GHz, including critical bands for the satellite industry as well as other industries.

The GSC strongly opposes such studies. The C-band, Ku-band and Ka-band are core satellite frequency bands, and are already heavily used today. Introducing IMT-2020 into these bands would **interfere** with existing satellite services, negatively impact investment and **harm competition** by limiting the ability of satellite operators to meet the growing demands of satellite users, including government, enterprises and end users, wherever they are located. In particular, introducing IMT-2020 into these bands would displace satellite services which today provide connectivity to those underserved or unconnected, and so, would **widen – not narrow – the digital divide.**

It is critical the satellite C-band, Ku-band and Ka-band remain preserved, given their extensive use worldwide and the multi-billion dollar investments behind them. Due to the 15+ year satellite life cycle, long term regulatory certainty and reliable access to spectrum is required for future planning to support new use cases, many of which will be essential for the satellite contribution to the 5G network of networks.[2] The GSC believes the key is to find the right balance at international level to provide adequate spectrum for various industries and technologies to develop and offer services to the public in parallel, without detrimental impact to crucial existing services. Today, satellite networks provide connectivity to users no matter where they are located, in metropolitan and rural areas alike, and whether they are at work, at home, on an aircraft, a ship or a vehicle. No other technology offers this reach or these capabilities to the entire world.

The GSC recommends administrations continue to support the development of all industries by providing both IMT-2020 and satellite interests with the spectrum access and regulatory certainty required for continued operations and future sustainable investment. Considering the amount of spectrum currently identified for IMT-2020, the potential candidate bands under WRC-19 Agenda item 1.13, and the anti-competitive and adverse operational impact of the proposed additional IMT-2020 identification, **no new agenda item for additional IMT-2020 identification should be favored by administrations.**

1 https://www.lstelcom.com/fileadmin/content/marketing/news/2019_Study_LicensingUseofMobileSpectrum.pdf
2 https://www.ecodocdb.dk/download/e1f5f839-ba17/ECCRep280.pdf

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