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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23)Dubai, 20 November - 15 December 2023** |  |
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| PLENARY MEETING | **Document 175-E** |
|  | **30 October 2023** |
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| Proposals for the work of the conference |
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| Agenda item 1.2 |

1.2 to consider identification of the frequency bands 3 300-3 400 MHz, 3 600‑3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution **245 (WRC‑19)**;

# 1 Background

This input contribution addresses the possible IMT identification in the frequency bands 6 425-7 025 MHz (Band 4 for Region 1) and 7 025-7 125 MHz (Band 5 globally) as specified in Resolution **245 (WRC-19)**, highlighting the concerns and applicability for the ITU Regions 1 and Region 3.

To begin with, it is important to notice the existence of current network deployments and operations of terrestrial and satellite systems that provide essential services for national safety matters, emergency and disaster communications, citizens, business and government connectivity services, aeronautical to maritime safety-related services critical for operations, and observation of global soil moisture, sea surface temperature and temperature of sea ice for weather forecasting and climate monitoring using passive microwave sensor measurements.

Not to mention that the bands consist of unplanned fixed-satellite services (FSS) on a co-primary basis and a planned band with Appendix **30B** to the Radio Regulations (RR AP**30B**) in its upper part (frequency band 6 725-7 025 MHz) whose objective is to guarantee in practice, for all countries, an efficient use and equitable access to the geostationary-satellite orbit. The development of the AP**30B** plan involved an international effort to provide equity among administrations in the development of satellite communications and in order to facilitate the provision of satellite services in national territories, which makes it a critical matter for developing countries.

In particular, Region 1 encompasses a wide diversity of territory and natural resources. However, the radioelectric spectrum becomes one of the natural resources that all countries in Region 1 share and use to provide communication services that benefit their societies and economies. Within this context, the diversity of this Region implies several challenges in the development of new communication networks due to the importance of protecting the systems already deployed. Hence, a precise analysis of the network deployments and technology demands, needs to be addressed.

For instance, for the Arab Region, satellite systems in the C-Band represent an essential asset for their national telecommunication infrastructure due to its unique characteristic of wide coverage, necessary for providing connectivity in underserved areas and connecting remote regions where natural conditions prevent or inhibit the deployment of terrestrial communications networks.

For Africa, the satellite systems used in the C-Band are widely used for broadcasting, mission-critical services for safety of life purposes, banking and finance, energy production, civil aviation, government sectors, and for the provision of connectivity in rural areas. In this regard, the use of satellite communications becomes a critical issue by reason of its resistance to rain fade and wide coverage, due to Africa's particularities of size, weather, topography and population distribution.

For Europe the data collected by satellite systems in the 6 GHz frequency band are used for weather forecasting and climate monitoring. It is also considered for the European Secure Space Connectivity System (ESSCS) project which is planned as an initiative of the European Union (EU) focused in providing reliable, secure and cost-effective governmental connectivity essential for the protection of critical infrastructure for energy, government, life-safety, health, maritime and aeronautical safety and communication sectors throughout Europe. Even more, it represents the third pillar in the EU space programme, complementing Galileo/EGNOS satellite navigation systems and the Copernicus Earth observation system.

Thus, due to the importance of the satellite communications in the 6 GHz frequency band, the Working Party 5D conducted studies pertaining to the possible use of the terrestrial component of IMT with the view to ensuring protection of services to which the frequency band is allocated on a primary basis. However, there was no consensus on the parameters considered for the studies and no conclusion was provided. The results and conditions provided by the parties interested only showed a perspective that doesn’t address appropriate conditions for the deployment of IMT networks, that would affect the current use and further development of FSS and the fixed service (FS), and even more, that would prevent the deployment of other mobile technologies that could be also used under the mobile co-primary allocation.

Additionally, CPM Report states at the beginning of section 1/1.2/3.2 Sharing and compatibility studies, that the information and materials of the summaries of the study results showed in the comparison tables are for information based on the following: *“(…) that the assumptions, input parameters and interference criteria including the use of ITU-R Recommendations and Reports in force are generally neither identical nor representative and, in particular, not agreed by ITU-R (…)” and* *“(…) no firm or general conclusions are therefore expected to be reached on the results of studies displayed in various columns of the tables. Individual membership and regional telecommunication organizations are invited to make their own analysis of studies and draw their own conclusions, taking into account prevailing circumstances and interference environment as well as other conditions in their countries/regions as they find appropriate and valid.”*

Complementary to the before mentioned, the frequency bands 6 425-7 025 MHz and 7 025-7 125 MHz, or portions of it, are already being used worldwide for unlicensed use, such as WAS/RLAN under the existing mobile service allocation on a primary basis. This use responds to the need of bridging the digital divide, meeting increasing traffic demands, demand of connectivity for underserved regions and the current availability of WAS/RLAN devices in the market.

In particular, for ITU Region 3, the use of WAS/RLAN technologies would benefit from mobile offload and would prevent the growing congestion as experienced in the 2.4 GHz and the 5 GHz were the congestion of the band impacts the quality of service. Also, WAS/RLAN technologies can be used for the development and use of new applications where low latency and wider channels are needed, such as augmented, virtual, and extended reality (AR/VR/XR), as well as extend its use and benefits to entertainment, navigation, health, enterprise and industrial applications, product design, health and government sectors.

It is to notice that the necessary conditions to meet for a non-interference use of IMT and WAS/RLAN in the 6 GHz frequency band, are of the utmost importance due to the benefits that the FSS and FS already provide, so any regulation must be done avoiding constraints to the services already in use. It is also to notice that some Administrations have decided to implement IMT while other have decided to use the band for WAS/RLAN. However, the inherent principle of using mobile unlicensed technologies is leading them to operate without adding any constraints or creating harmful interference to the primary services, i.e., FSS, FS; thus, it is in compliance with the principles stated in the Radio Regulations (RR).

Hence, in the view of considering the best approach of the actual and future use of the frequency band and in order to provide flexibility to each administration to deploy a range of technologies, a “No Change” position is considered as the right approach at the WRC‑23 for the frequency bands 6 425-7 025 MHz and 7 025-7 125 MHz.

In this regard, the co-signing administrations have taken into consideration several factors, including the following:

1) Studies conducted pertaining to the possible implementation of the terrestrial component of IMT in the frequency band 6 425-7 125 MHz, used a diversity of assumptions, input parameters and interference criteria that varies from study. Due to the high range of differences considered in each study, no consensus nor conclusion could be reached.

2) The findings from the studies conducted during this cycle, as per the CPM Report, have used assumptions on the parameters that underestimate the IMT interference to FSS receivers. Some of the studies that show feasibility of the coexistence between FSS and IMT, used parameters or correction factors that are not agreed by the ITU‑R Working Parties. Those assumptions don’t consider a realistic scenario for an IMT network deployment and displayed biased results towards compatibility.

3) The findings from the studies conducted during this study cycle, have stated that for protection of the FS it is necessary to consider a case-by-case analysis where the protection area can vary from tens to hundreds of kilometres. Over these assumptions, a protection basis is not assured and creates uncertainty of possible harmful interference created by the deployment of IMT networks.

4) A case-by-case scenario would add a regulatory burden to Administrations, as many countries will have to adapt their regulatory framework to consider all possible interference scenarios for protecting their incumbent services. The analysis comprises a coordination between their systems and those used by their neighbour countries. This process would result in additional time and costs burden depending on the technical scenarios, not to mention the consideration of further spectrum planning needed to avoid constraints for the future development for FSS and FS networks.

5) Recognition of the importance of the AP**30B** and its protection is considered as one of the main elements to allow the use of new technologies in the frequency band 6 725-7 025 MHz. Even though, IMT proponents uphold the benefits of an IMT deployment, the protection of the FSS is not guaranteed and would jeopardize the international efforts of providing a reliable service that enables critical applications that cannot be replaced by higher frequency bands that are more sensitive to atmospheric attenuation due to rain, and that are used to deliver connectivity, not just for urban and suburban areas, but also for rural areas where communication services are an essential transformation tool to build scenarios that benefits rural societies.

6) Measurements of the sea surface temperature have a severe impact on meteorological measurements which are used for life protection from major climatic events. IMT deployment will severely affect these measurements in locations up to several thousand kilometres from the coast. Hence, alternative bands for sea surface temperature which would exhibit better coexistence opportunities should be studied first.

7) That ICAO position regarding the use of the frequency band 6 425-6 575 MHz in Region 1 stated the need of regulatory provisions to protect the FSS uplinks in order to continue the use of the GSO FSS networks for the provision of aeronautical services, as any interference to MSS feeder uplinks in the frequency band 6 425-6 575 MHz could endanger aircraft operations. The co-signing Administrations and other Administrations consider that FSS systems used for aeronautical national emergencies and disasters cannot be jeopardized.

8) That WMO is not in favour of an IMT identification in the frequency bands 6 425-7 025 MHz or 7 025-7 125 MHz. WMO highlighted the importance of sea-surface temperature (SST) measurements used for weather forecasting and climate monitoring even though footnote RR No. **5.458** does not provide an EESS (passive) allocation in the frequency bands 6 425-7 075 MHz and 7 075-7 250 MHz. As IMT deployment in the 6 GHz frequency band will severely affect SST measurements in locations up to several thousand kilometres from the coast, measurements that are used for life protection from major climatic events will be severely affected.

9) Some administrations have already authorized the use of the frequency bands 6 425-7 025 MHz and 7 025-7 125 MHz for license-exempt technology by providing regulatory and technical provisions that facilitates the immediate use of available devices, fostering the creation of economies of scale and benefitting businesses, consumers, and economies.

10) That some Administrations have decided to implement IMT while other have decided to use the band for WAS/RLAN as a matter of national and regional policy. Hence, conditions for a non-interference use of IMT or WAS/RLAN in the 6 GHz frequency band must necessarily protect FSS and FS and avoid constraints to their future development.

11) Some Administrations are effectively taking advantage of a 1 200 MHz license-exempt band of contiguous bandwidth within 5 925-7 125 MHz to support the next generation of Internet applications by using technologies relying on Wi-Fi connectivity. These applications, such as AR/VR/XR, for entertainment, navigation, education, enterprise and industrial applications, product design, healthcare, e-government, industrial automation, IoT, 3D-video and AI, among others, require broader channel bandwidths.

12) The ITU‑R, in its effort of maximizing the benefits of using the spectrum, is working to revise the Recommendation ITU‑R M.1801-2 “Radio interface standards for broadband wireless access systems, including mobile and nomadic applications, in the mobile service”. This revision reflects the efforts to determine the most suitable standards to support a wide range of broadband Internet data and real-time data for urban, suburban and rural areas identifying broadband wireless access systems under the mobile service in the upper 6 GHz frequency band.

13) That decisions during the WRC‑23 must take into consideration the principles stated in the Recommendation **34 (Rev.WRC‑12)** “Principles for the allocation of frequency bands” which includes the following:

 *“(…)*

*recommends that future world radiocommunication conferences*

 *1 should, wherever possible, allocate frequency bands to the most broadly defined services with a view to providing the maximum flexibility to administrations in spectrum use, taking into account safety, technical, operational, economic and other relevant factors”;*

 *(…)*

 *4 should take into account relevant studies by the Radiocommunication Sector and report(s) of the relevant Conference Preparatory Meeting(s) (CPM), as appropriate, considering also contributions by members, including technical and operational developments, forecasts and usages as per the agenda of the WRC,*

 *(…)*

 *instructs the Director of the Radiocommunication Bureau and requests the ITU-R study  groups*

 *(…)*

 *2 to conduct these studies, with the participation of the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the World Meteorological Organization (WMO) and other international organizations concerned, where appropriate;”*

In reason of the above listed, the co-signing administrations support Methods 4A and 5A with no change to the allocations in the frequency band 6 425-7 125 MHz.

**2 Proposals**

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations
(See No. 2.1)

NOC ARS/LBY/QAT/SMO/SOM/175/1

5 570-6 700 MHz

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| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 5 925-6 700 FIXED 5.457 FIXED-SATELLITE (Earth-to-space) 5.457A 5.457B MOBILE 5.457C 5.149 5.440 5.458 |

**Reasons:** The co-signing countries propose no change for the frequency bands 6 425-7 025 and 7 025-7 125 MHz. This solution would allow the protection of incumbent services and their future development, while maintaining the flexibility to make the best use of the bands under the existing allocations while supporting their future development.
Accordingly, extensive technical studies have shown that IMT networks cannot coexist with important incumbent services in the frequency band 6 425-7 125 MHz. Wider IMT harmonization in the frequency band 6 425-7 125 MHz is not feasible due to coexistence issues and decisions by several administrations not to use this spectrum for IMT network deployments. Importantly, IMT implementations would lack the economies of scale necessary for a robust equipment ecosystem or commercial viability.

NOC ARS/LBY/QAT/SMO/SOM/175/2

6 700-7 250 MHz

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| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 6 700-7 075 FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.441 MOBILE 5.458 5.458A 5.458B |
| 7 075-7 145 FIXED MOBILE 5.458 5.459 |

**Reasons:** The co-signing countries propose no change for the frequency bands 6 425-7 025 and 7 025-7 125 MHz. This solution would allow the protection of incumbent services and their future development, while maintaining the flexibility to make the best use of the bands under the existing allocations while supporting their future development.
Accordingly, extensive technical studies have shown that IMT networks cannot coexist with important incumbent services in the frequency band 6 425-7 125 MHz. Wider IMT harmonization in the frequency band 6 425-7 125 MHz is not feasible due to coexistence issues and decisions by several administrations not to use this spectrum for IMT network deployments. Importantly, IMT implementations would lack the economies of scale necessary for a robust equipment ecosystem or commercial viability.

SUP ARS/LBY/QAT/SMO/SOM/175/3#1391

RESOLUTION 245 (WRC‑19)

Studies on frequency-related matters for the terrestrial component of International Mobile Telecommunications identification in the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz,
7 025-7 125 MHz and 10.0-10.5 GHz

**Reasons:** Consequential changes. Resolution **245 (WRC-19)** is not necessary anymore.

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