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| Proposal: | |
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CEPT BRIEF ON AGENDA ITEM 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 International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution 245 (WRC-19).

# ISSUE

This agenda item considers, based on the result of sharing and compatibility studies, possible identification of the frequency bands 3300-3400 MHz, 3600‑3800 MHz, 6425‑7025 MHz, 7025‑7125 MHz and 10.0‑10.5 GHz, or parts thereof, for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis as appropriate. This will encompass the following elements, set out in full in Resolution 245 (WRC-19):

* Studies of technical operational and regulatory issues pertaining to the possible use of the terrestrial component of IMT in the frequency bands listed below.
* Sharing and compatibility studies[[1]](#footnote-1) with a view to ensuring the protection of services to which the frequency band is allocated on a primary basis, without imposing additional regulatory or technical constraints on those services, and also, as appropriate, on services in adjacent bands, for the frequency bands:

3 600-3 800 MHz and 3 300-3 400 MHz (Region 2);

3 300-3 400 MHz (amend footnote in Region 1);

6 425-7 025 MHz (Region 1);

7 025-7 125 MHz (globally);

10 000-10 500 MHz (Region 2)

NOTE: The order of bands in the list above is aligned with that in Resolution 245 (WRC-19). For the preliminary CEPT Position in Section 2 below, the bands are listed in numerical order for ease of reading.

# CEPT position

3300-3400 MHz (amend footnote in Region 1)

* CEPT does not support amendments to footnotes 5.429A and 5.429B which could extend them to countries north of 30° parallel north. Thus, CEPT does not support an IMT identification for the entire Region 1. Furthermore, CEPT opposes amending the footnote to change the regulatory provisions applicable to IMT stations in the band. In particular, IMT stations shall not cause harmful interference to, or claim protection from, systems in the radiolocation service in various national and international operational environments and shall meet unwanted emission levels specified in the relevant ITU-R Recommendations. In addition, protection of FSS in the frequency band 3400-3800 MHz should also be ensured, as appropriate.

3300-3400 MHz (Region 2)

* CEPT supports maintaining the regulatory provisions in the footnotes 5.429C and 5.429D applicable to IMT stations in this band. In particular, IMT stations shall not cause harmful interference to, nor claim protection from, systems in the radiolocation service in various national and international operational environments and shall meet unwanted emission levels specified in the relevant ITU-R Recommendations.

3600-3800 MHz (Region 2)

* CEPT would not oppose an IMT Identification in Region 2, noting that administrations of Region 2 are expected to define relevant provisions to protect FSS earth stations

6425-7025 MHz (Region 1) and 7025-7125 MHz (globally)

CEPT is neither proposing nor supporting an IMT identification of the frequency range 6425-7125 MHz but could accept it if the conditions below are fulfilled. If these conditions are not fulfilled, CEPT will support NOC (underlined).

CEPT will only accept an IMT Identification if all of the following 5 conditions are fully met:

1. the protection of relevant primary services is ensured (as provided in the European Common Proposal (ECP));
2. continued operation of other services (i.e. those identified in RR Nos. 5.458 for EESS (passive) and 5.149 for Radioastronomy) is addressed (as provided in the ECP) with additionally new EESS (passive) primary allocations in the bands 4.2 – 4.4 GHz, and 8.4 – 8.5 GHz, to allow the continued operation of Sea surface temperature (SST) measurements;
3. no limitations are imposed on the existing services and their future development;
4. the IMT Resolution clearly outlines opportunities for other broadband applications in the mobile services (i.e. WAS/RLAN) as well as sufficient flexibility regarding the future wireless broadband usage, i.e. by IMT, WAS/RLAN or under a shared framework between IMT and WAS/RLAN as provided in the ECP
5. WRC-23 does not approve an agenda item for WRC-27 studying additional IMT identifications in frequency bands between 7-30 GHz where IMT would have the potential to jeopardize important European space and governmental spectrum.

10000-10500 MHz (Region 2)

* CEPT is of the view that the result of a possible identification of the frequency band 10-10.5 GHz in Region 2 under this agenda item has a global impact on EESS (active) in the band 10.0-10.4 GHz and may have a global impact on EESS (passive) in the band 10.6-10.7 GHz due to the required protection of these services on a global basis. Moreover, interference would be detrimental to airborne and shipborne radars operating in 10-10.5 GHz under the radiolocation Service operated by some CEPT countries in all Regions at 10-10.5 GHz. Sharing and compatibility studies between IMT and EESS (active) show that sharing between IMT and those services is not possible. Therefore, CEPT is of the view that the band 10 – 10.5 GHz should not be identified for IMT in Region 2 in order to ensure the protection of the radiolocation and the globally operating EESS (active) systems and in order to not impose any additional regulatory or technical constraints to these services.

# Background

CPM23-1 identified WP 5D as the responsible ITU-R group for this Agenda item.

## 3300-3400 MHz

Due to the usage of various types of radars (terrestrial, maritime, aeronautical) in various national and international operational environments, CEPT did not support the IMT identification in the band 3300-3 400 MHz under WRC-15 Agenda item 1.1.

The band 3300-3400 MHz is allocated to radiolocation on a primary basis. This frequency band is extensively used by different type of radars (terrestrial, maritime, aeronautical) with no foreseen change in usage of the band on a long-term basis. This band is not supported for mobile broadband nor adding countries (in particular north of 30° parallel north) in footnote in Region 1 due to incompatibility between radiolocation and mobile (IMT) services in co-channel taking into account that radiolocation is used in various national and international operational environments and large co-channel interfering distance showed by recent ITU-R studies (ITU-R Report M-2481-0). This is why there are regulatory provisions in the relevant footnotes of radio regulation concerning the use of the frequency band 3300-3400 MHz by IMT stations in the mobile service. Those IMT stations shall not cause harmful interference to, or claim protection from, systems in the radiolocation service, and administrations wishing to implement IMT shall obtain the agreement of neighbouring countries to protect operations within the radiolocation service. There is a need to maintain the current regulatory provisions applicable to IMT stations in this band in both Region 1 and 2.

Studies from ITU-R Report M.2481-0 show large separation distance resulting in the conclusion that the co-frequency operation of IMT base stations is not compatible with radars. This leads to consider large exclusion/restriction zone of the IMT deployment to protect the radiolocation system. The size of the restriction zone could be tuned in accordance with the deployment type (Macro or small cells), the base-station power reduction, an adjustment in the radiation pattern or/and of the height of the base-station antenna.

In addition, studies from ITU-R Report M.2481-0 conducted for adjacent scenario show that coexistence between IMT systems and radar systems in adjacent bands is possible provided that IMT BS comply with certain unwanted emissions levels, depending on several factors e.g. the separation distance between the closest base-station and the radar system. The feasibility of implementing such unwanted emission levels in AAS base stations will depend on the required protection level and frequency separation between the radar and IMT.

The frequency band 3100-3300 MHz is also allocated to EESS (active) on a secondary basis, while the frequency band 3400-4200 MHz is allocated to the FSS on a primary basis and the protection of FSS earth stations within this frequency range needs to be ensured as appropriate.

## 3600-3800 MHz

CEPT developed its position for WRC 15 on compatibility between FSS and MS in the frequency band covering both 3400-3600 MHz and 3600-3800 MHz, in particular, on the basis of ITU-R Reports S.2368 and M.2109.

Conclusions from these ITU-R Reports shows that:

* deployment of IMT would constrain future FSS earth stations from being deployed.
* international coordination of IMT Base stations with respect to the FSS and FS stations is needed due to the large separation distance required.

WRC-15 agreed on measure in 3400-3600 MHz (including relevant international coordination and pfd limit) applicable before putting into use base or mobile stations in order to avoid constrain on future FSS earth stations from being deployed. This measure ensures also protection of fixed service.

In Region 1 in the band 3600-3800 MHz in allocated to FSS and FS on a primary basis and MS on a secondary basis. However, the band is harmonised for mobile broadband in CEPT (ECC/DEC/11(06)) and there is a trend for a reduce usage of FSS and FS in 3600-3800 MHz in large number of CEPT countries. CEPT noted that concerning Region 2, similar measure to protect FSS as the one above in 3400-3600 MHz is already in force in 3600-3700 MHz in few countries while no particular measure exists to protect FSS in 3700-3800 MHz.

## 6 425-7 025 MHz

### Fixed service

The band 6425-7125 MHz is allocated to fixed service on primary basis and used in CEPT countries for long haul, high capacity and long distance fixed links supporting variety of applications as mobile networks backhaul supporting the development of mobile broadband, utilities networks, broadcasting backhaul, technological communication networks (private, industrial purpose), governmental uses. There are some but not many alternative frequency bands for FS with similar properties. Different channel spacing could be implemented in CEPT countries as recommended by ECC/REC/(14)06 while providing guard bands and centre gaps of channel arrangements. In addition, some countries have recently introduced plans to implement narrow-band channelling supporting migration of fixed links from part of L Band (harmonised for mobile SDL) to the band 6425-7125 MHz requiring long-term certainty for investments in those countries. ECC Report 215 demonstrates that the 6 GHz band is suitable for introducing narrow channels without causing harmful interferences to other services with appropriate mitigation techniques ensuring compatibility between fixed links and satellite services.

According to the latest revision of ECC Report 173 on "Fixed Service in Europe Current use and future trends post 2022", published in June 2023, the 5.9 GHz to 7.1 GHz frequency range has been traditionally used in Europe for P-P links for a long time although P-MP use is also allowed and after a downward trend in numbers towards the end of the 20th century, mainly due to the migration from analogue to digital links, numbers stabilised till 2010 then there was a significant increase in the overall numbers up to the present day. 3 different sub-ranges are indicated (5925-6425 MHz, 5925-7125 MHz, 6425-7125 MHz) as being open by all administrations and are used for P-P by the great majority of them.

About 22000 P-P links are indicated as active in total by administrations, about one third is operating in 5925-6425 MHz frequency range and two thirds above 6425 MHz. The use of unidirectional links is limited but main use is for high capacity, long distance P-P links are implemented, mainly forming part of fixed, mobile and broadcasting infrastructure. There have also been new bands opened for narrow band P-P links. Licensing regimes are mostly done on a link-by-link basis with some administrations doing block assignment.

For hop lengths in these bands: 95% percentile of “typical” length is about 50 km for the 5.9-6.4 GHz band and for both ranges, (about 20 km for those indicated as “minimum”); 70 km is the 50% percentile of the “maximum” indication.

There is demand for wider channel bandwidths for backhauling for mobile networks to enable 5G data rates. Such wider bandwidth demand in urban areas will likely need to be addressed by higher FS bands. Furthermore, the growing availability of fibre will most likely decrease the need for wireless backhauling for mobile networks in urban areas, including wireless backhauling in the 6 GHz frequency band. This increase in fibre use might not have the same impact on other fixed link applications in this frequency band (e.g. backhauling for broadcasting networks).

Current FS usage in 6425-7125 MHz is a mixture of rural and urban deployment within CEPT countries and the frequency band seems to be used predominantly in rural areas within CEPT. In some cases, links are between urban and rural areas, due to high link distances (current overall average link distance seems around 30.6 km). Responses provided to the Questionnaire on use of frequency bands 6425-7025 MHz and 7025-7125 MHz in relation to studies in CEPT on WRC-23 agenda item 1.2 shows that very few CEPT countries identified for these band some level of congestion while others reported no congestion or no fixed links in these bands. ECC Report 303 identified mechanisms which allow for continued FS operation in the 26 GHz pioneer band. Subject to corresponding studies, CEPT could consider whether it is feasible to identify mechanisms allowing continued FS operation while introducing IMT in the band, if continued FS operation is required.

Several in-band sharing and compatibility studies between the FS and IMT in the frequency band   
6425‑7125 MHz were submitted to CEPT and ITU-R as detailed below.

Monte-Carlo studies using the typical parameters from the relevant ITU-R groups and considering a cluster of IMT cells found that:

* For the FS antenna main lobe interference scenario, the required separation distance ranged from 10 to 68 km, while the required separation distance ranged from 1 to 10 km in the side lobe interference scenario.
* two sensitivity analysis using a C/I criterion found that the separation distances will be from 1.5 to 43 km for the main lobe scenario and less than 1.5 km for the side lobe scenario.

One sensitivity analysis considered an IMT antenna with sub-array configuration resulting in separation distances of 44 to 58 km for the main lobe scenario and less than 3 km for the side lobe scenario.

One deterministic calculation considering the long-term protection criteria of -10 dB (for no more than 20% of the time) for the worst static case study found that separation distances ranging up to 122 km considering IMT BS is above the clutter, but reduces to 59 km when the IMT BS is placed inside the clutter (using example of typical values for FS point-point system parameters provided by the responsible ITU-R group).

Further analysis was carried out without clutter and using FS system parameters (based on Recommendation ITU-R F.758-7 and on real deployments) with 46/47.4/48.6 dBi antenna gain. Antenna gain values represent worst case which is rarely used in actual deployment. These study results indicate that the separation distance can go up to 200 km.

All the separation distances above mainly depended on the coexistence scenario, ways to account for clutter losses and propagation losses. The separation distances can be further reduced in actual deployment by considering mutual positioning of the elements (back lobe vs. main lobe scenario) and locating the IMT BS within the clutter.

The studies summarized above showed that co-channel coexistence between IMT and the fixed service would require site by site coordination across borders as well as if IMT and FS are deployed in the same or in adjacent geographical areas within a country.

The results above equally apply to the coexistence within national borders and between borders. Some additional factors may facilitate sharing in some cross border cases: additional separation between the fixed link receiver and the IMT network may be available where IMT/fixed links are not deployed close to the border; additional angular separation may apply since fixed links would typically be serving territories within their respective countries.

Within a country, when considering the C/I protection criterion, the resulting separation distances is expected to be comparable to hop-length of fixed links specified in the fixed links characteristics table recommended by WP 5C.

### Fixed Satellite service

Information on satellite usage and projects is provided hereafter. A number of satellite projects are on-going and there is a need for long-term planning to support the needs of this industry.

A screenshot of a television

Description automatically generated

Figure 1: FSS usage of the frequency band 6425 – 7125 MHz

Currently 16 CEPT administrations indicated some satellite usage of the sub-bands in the upper 6 GHz band, some administrations indicated allocations without specifying further details, while others provided information on ITU filings or earth stations/licences. Eight CEPT administrations confirmed they have no satellite usage and one administration has only allotment in App 30B. Ten CEPT administrations explicitly reported no earth stations in these bands. One CEPT administration noted that usage is expected to be affected by changes in the receiving band 3.4 – 4.2 GHz.

Tables 2 and 3 of the document ECC PT1(21)086 Annex VI-02a (summary) provide more precise information about satellite usage and earth stations deployment (respectively) in different CEPT countries.

A separate study ([https://www.euroconsult-ec.com/connectivity-expertise/download-extended-c-band-presentation](https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.euroconsult-ec.com%2Fconnectivity-expertise%2Fdownload-extended-c-band-presentation&data=05%7C01%7CRobert.Cooper%40ofcom.org.uk%7C542e61a96e73413ebf2208db47d637c5%7C0af648de310c40688ae4f9418bae24cc%7C0%7C0%7C638182757612851765%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=wk%2BX7iuU8T0WXUJoblDOz1uKBE7XhdHKebfenfMv7n4%3D&reserved=0)) which assessed the use of the extended C-band, planned C-band and the 7025-7075 MHz band for satellite services in Region 1 indicated, amongst other things:

Use of Extended and Planned C-band capacity would currently represent around 2% of the total commercial satellite capacity;

Around ~70% of the satellites currently deployed in the Extended and Planned C-bands on the downlink and visible from ITU Region 1 are expected to no longer be in operation by 2030.

Some information presented in that study is disputed by satellite operators.

#### FSS uplink (6425 -7025 MHz)

The frequency band 6425-6725 MHz is allocated to the FSS (Earth-to-space) globally and is not subject to a Plan. Uplink earth stations are deployed in Europe and operate with existing FSS satellite systems (see Doc ECC PT1(21)086 Annex VI-02a). The band is used for the uplinks by GSO FSS networks, which includes use of telecommand links in accordance with RR No. 1.23.

The use of this band includes feeder links for MSS systems. Some of these systems use parts of this FSS (E-s) allocation in accordance with the definition of fixed-satellite service in RR No.1.21 to provide feeder links to support L-band services. Interference to these feeder uplinks is translated at the satellite to interference to the L-band downlink signals and could impact those L-band services.

The frequency band 6725-7025 MHz is allocated to the FSS globally (Earth-to-space) and the use of the band is subject to the provisions of Appendix 30B (RR No. 5.441). The band is used for the uplinks by GSO FSS networks in the Plan and the List covering all Regions. The main objective of the FSS Plan of AP30B is to guarantee in practice, for all countries, equitable access to the geostationary-satellite orbit in the frequency bands of the FSS covered by this Plan which is important for developing countries. The need to use national allotments of the Plan depends on the demand of each particular country.

GSO FSS satellite receivers in this band would likely see the potential interference from large areas on the surface of the earth, including areas outside of Europe, depending on the satellite beams and positions.

There is a need to assess the future evolution of the C-band downlink spectrum where IMT systems have been introduced in accordance with the EU/ECC regulatory frameworks in the lower part of the band 3400 – 3800 MHz (Decision [(EU) 2019/235](https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1549615962331&uri=CELEX:32019D0235) and ECC/DEC/(11)06), and downlink satellite communications are concentrated in the upper part of the band 3800 – 4200 MHz in Europe. Due to the fact that the 3400-3800 MHz band has been identified as the 5G primary pioneer band in Europe[[2]](#footnote-2) the use of the band for IMT is rapidly increasing, several Administrations in Europe have decided not to issue new FSS licenses in this band.

The band 3700 - 4200 MHz was originally paired with 5925 – 6425 MHz (2x500 MHz) for satellite communications. The World Administrative Radio Conference 1988 approved the addition of the frequency band 3400 – 3700 MHz paired with 6425 – 6725 MHz (2x300 MHz) as new allocations for the Fixed Satellite Service. The satellites in orbit or under construction generally have these pairings but not in all cases.

Noting a limited number of coordinated earth stations operating in the band 3400 – 3700 MHz for the downlink direction, a similar trend may be seen for the number of Earth stations in the corresponding uplink direction 6425 – 6725 MHz. There are Earth stations that are deployed in Europe which operate with existing FSS satellite systems, including feeder links for MSS systems, in the bands 6425-6725 MHz (Earth-space) and 6725-7025 MHz (Earth-space). The total number of earth stations deployed in Europe and operating within these FSS allocations is limited.

Regarding use of the planned bands (4500 – 4800 MHz downlink paired with 6725 – 7025 MHz uplink), the downlink is constrained in some CEPT countries, which may reduce the interest for uplink in Europe. Some CEPT countries use these frequency bands of the AP30B Plan outside Europe.

For the bands 6425 – 6725 MHz and 6725 – 7025 MHz, the situation in the corresponding downlink bands does not relieve any new IMT systems from the RR obligation for IMT to protect satellite receivers in the band 6425-7075 MHz. Furthermore, it should be noted that wide coverage is an inherent characteristic and advantage of satellite C-band, and that the C-band is used for satellite connectivity outside of CEPT region. It should also be noted that the use of Appendix 30B bands by IMT may raise some concerns from developing countries.

Considering the criticality of some of the applications (e.g. Telecommand (as for other FSS bands), GMDSS and AMS(R)S), the C-band frequencies cannot be easily substituted by higher frequency bands which are more sensitive to atmospheric/rain attenuation.

There are a total of 20 studies reflected in the CPM Report assessing the interference from IMT stations into FSS space stations in a geostationary orbit and using satellite carriers and protection criteria specified by the responsible ITU-R group. These studies cover the different satellite carriers classified as global beam, hemi beam, zone beam and spot beam.

Studies have shown that long-term interference is the limiting case, and therefore those results are used for the summary and comparison of the studies.

Global beam

Among the 16 studies assessing the global beam (carrier #1, #7 and #12):

Studies A, B, D, H, I, J, K, L, M, Q, R found that the long-term protection criterion is met with I/N values ranging from -28.23 dB to -16.2 dB and interference margins ranging from 17.73 dB to 5.7 dB.

Studies E, F, G, S, T found that the long-term protection criterion is not met with I/N -6.5 dB to 6.6 dB values and interference margins -7 dB to −20.1 dB.

Hemi beam

Among the 8 studies assessing the hemi beam (carrier #2):

* Studies B, H, M, Q, R found that the long-term protection criterion is met with I/N values ranging from −20.41 dB to -12.5 dB and interference margins from 9.91 dB to 2 dB.
* Studies E, F, G found that the long-term protection criterion is not met with I/N values ranging from −1.0 dB to 10.4 dB and interference margins from −12.5 dB dB to −23.9 dB.

Zone beam

Among the 5 studies assessing the zone beam (carrier #3 and #8), Studies A, B, H, J, M found that the long-term protection criterion is met with I/N values ranging from -29.14 dB to -13.25 dB and interference margins from 11.80 dB to 2 dB.

Spot beam

Among the 6 studies assessing the spot beam (carrier #4 and #12)

* Studies M, Q, L found that the long-term protection criterion is met with I/N values ranging from -26.3 to -13.02 dB and interference margins from 15.8 dB to 2.52 dB.
* Studies C, F, G found that the long-term protection criterion is not met with I/N values ranging from −6 dB to 11.8 dB and interference margins from −7.5 dB to −25.3 dB.

Appendix **30B**

Ten studies evaluated the interference to 14 FSS allotments from Appendix 30B of the Radio Regulations. These carriers were not directly provided by the ITU-R Working Party in charge of the FSS and were considered from the RR. Among these studies:

* Studies A, J, M, N, P, Q, R found that the long-term protection criterion is met with I/N values ranging from −28.19 dB to -14.6 dB and interference margins from 17.69 dB to 4.1 dB.
* Studies E, F, T found that the long-term protection criterion is not met with I/N values ranging from −13.4 dB to 5 dB and interference margins from −0.1 dB to −18.5 dB.

Study U was submitted to ECC PT1, and to CPM23-2 and was not fully reviewed. Considering global beam Carrier #12, if IMT density were based on D1 (explained in the study) or Ra1Rb1 then coexistence would be feasible. If IMT density were based on D2 (explained in the study), Ra1Rb2, Ra2Rb1, or Ra2Rb2 then additional mitigations would be needed. Considering Hemi beam Carrier #2 and Spot beam Carriers #4 and #12, Study U concluded that IMT would exceed the protection criteria.

Sensitivity analysis

Study H additionally considered a sub-array configuration for the IMT base station antenna. Comparison of coexistence between the baseline single element and the sub-array model shows that while there is a reduction in margin in some cases, in other cases the margin slightly increases in comparison with the single element configuration. Specifically, for the cases where the footprint area corresponding to low elevation angles are large, the sub-array configuration provides additional margin as compared to the baseline single element case.

Study U studied, in addition to the Ra Rb method, IMT deployment density using a BS distribution based on population density using data from networks in one country. In this additional method to model deployment density rural IMT deployments are considered, and the results confirmed the findings from the baseline studies using the Ra Rb method.

#### FSS downlink (6700-7075 MHz)

The frequency band 6 700-7 075 MHz is allocated to the FSS globally (space-to-Earth) for feeder links for non-geostationary satellite systems of the mobile-satellite service (MSS). The use of this band by feeder links for non-geostationary satellite systems in the mobile-satellite service is not subject to No. 22.2 as per footnote RR No. 5.458B.

There are currently a limited number of earth stations (space-to-Earth) in the bands 6725 - 7025 MHz, 7025 - 7075 MHz, operating with LEO and MEO satellites.

The band 6 700-7 075 MHz is considered for a MEO satellite system with coverage over Europe that will have up to 20 gateway earth stations, and is also considered for the European Secure Space Connectivity System (ESSCS) project which is planned as an initiative of the European Union (EU) towards a third EU space pillar after Galileo and Copernicus. Additional MSS systems could be triggered by future WRC-23 decisions under agenda items 1.7 or 1.18, or through item 2.13 of the preliminary agenda for WRC-27. The 6700-7075 MHz FSS (space-to-Earth) allocation ruled by No. 5.458B is a particularly good candidate, paired with the 5091-5250 MHz FSS (Earth-to-space) allocation, noting that the other similar feeder link allocation in 19.3-19.7 GHz/29.1-29.5 GHz will soon become congested with the deployment of “mega-constellations” in addition to existing systems.

Due to the foreseen satellite usage described above, the total number of receiving earth stations using the 6700-7075 MHz feeder link allocation will increase but will remain limited.

All sharing studies within ITU-R have shown that separation distances are required in order to protect the operation of non-GSO FSS earth stations. These separation distances range between a few kilometres to tens of kilometres. These protection distances are site specific and depend on several elements such as the propagation parameters, local terrain topography, surrounding clutter (including vegetation losses as appropriate e.g. during the seasonal changes) station and orbital parameters of the non-GSO system, and satellite selection strategy.

The minimum elevation angle should be treated with care to distinguish between the acquisition phase and communication phase taking into account the FSS DL receiver characteristics for each phase.

### Use of the band 6650-6675.2 MHz for RAS (RR No. 5.149)

Resolution 245 (WRC-19) limits the sharing and compatibility studies to the services allocated on primary basis, therefore as the band 6650-6675.2 MHz is not allocated to radio astronomy it is thus not under study in ITU-R WP 5D for WRC-23 agenda item 1.2 (see Document 5D/561).

Taking into account RR No. 5.149, CEPT administrations are invited to consider the studies in WP 7D to understand the potential impact of IMT deployment in this band on these RAS applications. Two studies have been performed so far not validated by WP 7D. Study 1 (ref. ECC PT1(21)229 from CRAF and SKAO) concludes that coordination between IMT and the RAS will require multi-lateral coordination, as the required separation distances exceed hundreds of kilometres for a mixed scenario of urban and suburban BS deployment. Study 2 (ref. ECC PT1(22)135) concludes that coexistence between RAS receivers and IMT urban macro base stations is a national matter and does not require multilateral discussions since the minimum required separation distance is in the order of 60 km.

The large discrepancy in the results can be attributed to different treatments of clutter losses. Study 1 applies the model according to Rec. ITU-R P.2108 only to the fraction of base stations, which are installed below the rooftops. Study 2 assumed that all base stations are fully affected by clutter loss based on an argument that beyond a distance of 1.5 km the probability for LOS conditions is very small (less than 1.5%, according to UMa scenario of Report ITU-R M.2412) also for a RAS receiver height of 50 m.

### EESS (passive) in the 6-7 GHz range (RR No. 5.458)

Whilst the band 6425-7025 MHz is not allocated to EESS (passive), it can be used, as part of the range 6425-7250 MHz, for passive sensor measurements in accordance with RR No. 5.458.

Based on Resolution 245 (WRC-19), which limits the sharing and compatibility studies to the services allocated on primary basis, sharing and compatibility studies between IMT and EESS (passive) in the 6-7 GHz range were not taken into consideration in ITU-R WP 5D for the evaluation of possible new allocations to IMT within AI 1.2 of WRC-23.

In the band 6425-7075 MHz, passive microwave sensor measurements are carried out over the oceans, including the coastal areas. Several satellites are already in orbit and are carrying out measurements in this band, some other are planned. The Copernicus Imaging Microwave Radiometer mission, CIMR, which is one of the high-priority missions for the expansion of the EU Copernicus programme, will operate also in the 6425 – 7250 MHz band.

Measurements around 6 GHz offer the best sensitivity to sea surface temperature but contain a small contribution due to salinity and wind speed which can be removed using measurements around 1.4 GHz and around 10 GHz.

Taking into account the wording of RR No. 5.458 “Administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6425-7075 MHz (passive microwave sensor measurements are carried out over the oceans, including the coastal areas) and 7075-7250 MHz”, CEPT administrations considered the studies presented in ITU-R WP 7C on the potential impact of IMT deployment in this band on these EESS (passive) applications.

These studies have shown that the introduction of high-density deployments of applications in the mobile service in the frequency range 6425-7125 MHz, depending upon the application, will interfere with SST measurements in locations up to several thousand kilometres from the coast.

These studies show that, SST measurements by satellite in the frequency range 6425-7125 MHz will be significantly degraded in the next years due to the amount of interference from the foreseen increased usage under the existing mobile allocation.

The SST is a vital component of climate system as it exerts a major influence on the exchange of energy momentum and gases between ocean and atmosphere. SST largely controls the atmospheric response of the ocean to meteorological and climatic time scales. Continuous measurements are crucial to ensure the protection of populations from major climatic events. Therefore, new EESS (passive) allocations are necessary.

In order to achieve this continuous SST measurement in a long-term basis, due to the ongoing studies and consequently to the IMT identification of the band 6425-7125, new primary EESS (passive) allocations are proposed in the 4.2-4.4 GHz and 8.4-8.5 GHz frequency bands, complementarily to the frequency ranges 6425-7075 MHz and 7075-7250 MHz.

## 7025-7125 MHz

### Fixed service

See section 3.3.1 for detailed background consideration concerning fixed links usage in the 7025 – 7125 MHz.

### Fixed Satellite service

7025-7075 MHz: this frequency band is allocated to the FSS globally (Earth-to-space and space-to-Earth) and is not subject to a Plan (see figure 1 above). See sections 3.3.2.1, 3.3.2.2 for discussion regarding sharing with FSS uplinks (non-planned) and FSS downlinks.

According to the information provided by ITU-R WP 4A to ITU-R WP 5D (WP5D/734), there is only one system using the range 7025-7075 MHz for uplink feeder links. This system is serving Region 2 countries (see ITU-R Report S.2515 on ‘Uplink interference considerations in the frequency band 7025-7075 MHz for a broadcasting-satellite service (sound) in Region 2’). For this band, in document 5D/734, WP 4A provided the characteristics of one GSO FSS uplink system (Carrier #11) and several non-GSO FSS downlink systems.

Usage of the 7025-7075 MHz band in Region 1 is currently limited to downlinks (gateways and links and the command and control), to about four teleports in three countries, including Türkiye and France in CEPT, for two constellations of satellites operating on S-band that provide IoT and satellite phone services;

There are existing satellite systems considering the use of the 6700-7075 MHz for NGSO MSS feeder links (space to Earth) and the 7025-7075 MHz (Earth to space) (see 6700-7075 MHz above for additional consideration).

In 7025-7075 MHz some specific European satellite projects require a limited amount of uplink spectrum, mainly for feeder links of other satellite services.

There is no FSS allocation in the frequency band 7075-7125 MHz.

### EESS (passive) as per RR No. 5.458

In accordance with ITU-R Recommendation RS.1861 the 7025-7125 MHz band is essential for observing global soil moisture, global sea surface temperature, temperature of sea ice and sea surface wind through cloud, in combination with other bands. In measurement of soil moisture, measurement in higher frequencies is strongly influenced by vegetation and the atmosphere, and the 6-7 GHz band is the most suitable for relatively higher spatial resolution measurements.

See also section 3.3.4 on general considerations related to EESS (passive) in the 6-7 GHz range.

### Space Research Service in adjacent bands

Frequency band 7145-7190 is allocated on primary basis for deep space SRS (E-s).

Frequency band 7190-7250 MHz is allocated on primary basis for SRS (E-s) for TT&C in accordance with RR No. 5.460.

Results from compatibility studies between IMT and SRS (E-s) presented at WP 5D meetings in October 2021, February 2022 and April 2022 for SRS space stations in both deep space and early/return near Earth mission phases indicate that there is a large margin and no compatibility problem for these scenarios.

A study, submitted to the WP5D meeting in June 2022, has assessed the potential impact from the unwanted emission of SRS (deep space) earth station into IMT receivers, assuming an unwanted emissions attenuation of 60 dBc (in a 4 kHz reference bandwidth) for the SRS transmitters, in accordance with RR Appendix 3. The study results show that coordination distances, ranging from tens of kilometres up to 400 km, may be required to ensure the protection of IMT BS receivers below 7125 MHz from unwanted emissions of SRS (deep space) earth station transmitters operating above 7145 MHz. The exact value of the required separation distances would have to be assessed, on a case-by-case basis, taking into account the specific parameters of the SRS earth station.

## 10000-10500 MHz

### Fixed Satellite Service

There is no FSS allocation in this band, but FSS (space-to-Earth) is heavily used above 10.7 GHz.

### Earth Exploration Satellite Service (active)

10.0 – 10.4 GHz: Since WRC-15 and driven by CEPT, this frequency band is allocated on a primary basis to EESS (active) on a worldwide basis. This allocation is critical to the operation of European Synthetic Aperture Radar (SAR) satellites for imaging across the globe.

European sharing and compatibility studies estimate the aggregate interference into an EESS active SAR satellite by IMT-2020 BS deployment within the main beam of that SAR satellite when pointing towards a dense area such big cities. The studies assess the impact of all IMT BS into a SAR satellite antenna main beam. One study methodology sets the SAR antenna pointing to its lowest incidence elevation angle on the Earth as it is assumed to be the worst case (more IMT BS seen within the main beam and at lower elevation so with higher off-axis gains towards the satellite).

Studies from CEPT administrations show that the aggregate interference from BS small cell/hotspot exceeds the SAR protection criteria by at least 11 dB for the static studies and baseline scenario. Other studies from CEPT administrations performed additional sensitivity analysis assuming macro cell deployments in the band. They show that the protection criterion of EESS (active) would be exceeded by 10.5 to 20 dB depending on the satellite beam look angle (respectively 18° to 45°). In addition, no aeronautical mobile stations are foreseen in the band and therefore the studies have not been conducted for this scenario.

The impact of user equipment emission into the SAR satellite receiver has not been assessed in this study and should degrade the above results.

The results of this shows that sharing between IMT in Region 2 and Active EESS service operating in 10-10.4 GHz (co-channel) is not feasible.

Additional studies are required to assess the adjacent frequency band interference from IMT in 10.4-10.5 GHz into EESS (active) operating below 10.4 GHz.

### Earth Exploration Satellite Service (passive)

10.6-10.7 GHz: This band is allocated to EESS (passive) on a primary basis (under RR No. 5.340 for the 10.68-10.7 GHz band).

It is currently under implementation into the Copernicus Imaging Microwave Radiometer mission, CIMR, which is one of the high-priority missions for the expansion of the EU Copernicus programme. The protection of EESS (passive) in this band is therefore of outmost importance for Europe.

Technical and operational characteristics of CIMR in the frequency band 10.6-10.7 GHz are included in the revision of Recommendation ITU-R RS.1861, approved in 2021.

One study, submitted to the October 2022 meeting of WP 5D, analyses the impact of a deployment of IMT base stations in the band 10-10.5 GHz in Region 2 into a particular EESS (passive) sensor operating in the band 10.6-10.7 GHz. This study shows that the TRP per IMT base station that permits to meet the EESS (passive) protection criterion has been determined to be -58.9 dBW/100 MHz when considering the single element pattern (baseline), and -50.2 dBW/100 MHz when considering the beam formed antenna pattern, within the band 10.6-10.7 GHz. It should be noted that the impact of UE (3 per sector) respectively led to -46.2 and -54.9 dBW/100MHz if a beamforming and single element model for the BS antenna was assumed (as the overall admissible aggregate interference for the sensor is apportioned between the UE and BS emissions).

### Radiolocation Service

The band 10-10.5 GHz is allocated to radiolocation service on a worldwide basis and is essential for radars operation including airborne and naval radars in all Regions. This band is used by some CEPT countries to support coordinated security, law enforcement, and humanitarian assistance efforts. Protection of these radars operated in all Regions have also to be ensured. Studies from some CEPT countries assessed the impact of the aggregate interference from micro-cells Base-Stations (BSs) into an airborne radar from IMT-2020 BS deployment within the main beam of that aircraft antenna when pointing toward urban and suburban areas. The aircraft is assumed to operate outside territorial waters of an administration having deployed IMT network. For this scenario, results show an exceedance of the protection criterion for different scanning angles of the radar even though the aircraft is 150 km away from the IMT mobile network. In such case, Sidelobe Suppression Level (SSL) technique applied to IMT BSs would not mitigate the aggregate interference as this one is dominated from the main lobe of some BSs antennas. Another (sensitivity) analysis from a CEPT country assuming a macro cell deployment further confirmed the increase of the protection criterion exceedance (more than 27.56 dB) even though the aircraft operates far from territorial waters (165km) of an administration. Finally, a dynamic study from a CEPT administration considered a moving aircraft with a rotating antenna (scanning mode) or towards the IMT network (tracking mode). Under this scenario, it was showed that the radar antenna suffered from an interference threshold exceedance in several directions of the scanning angles that can last several minutes. An 8 dB power reduction would be required when the aircraft is in the horizon of the IMT network.

In addition, no aeronautical mobile stations are foreseen in the band and therefore the studies have not been conducted for this scenario.

The results of this study show that sharing between IMT in Region 2 and Radiolocation service operating in 10-10.5 GHz (co-channel) is not feasible unless 8 dB in-band TRP reduction is applied to IMT hotspots.

### Additional considerations

CEPT developed its position from the results of sharing studies with incumbent services performed at WP 5D. Alternatively, in case of an IMT-identification at WRC-23 of the frequency band 10-10.5 GHz, additional technical/regulatory conditions need to be applied to protect the EESS (active), Radiolocation service, EESS (passive) and Radioastronomy service. These conditions have been included in ANNEX 1:.

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

* Resolution 245 (WRC‑19)
* Report ITU-R M.2109-0: “Sharing studies between IMT Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 and 4 500-4 800 MHz frequency bands”
* Report ITU-R S.2367-0: “Sharing and compatibility between International Mobile Telecommunication systems and fixed-satellite service networks in the 5 850-6 425 MHz frequency range”
* Report ITU-R S.2368-0: “Sharing studies between International Mobile Telecommunication - Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands in the WRC study cycle leading to WRC-15”
* Report ITU-R M.2481-0: “In-band and adjacent band coexistence and compatibility studies between IMT systems in 3 300-3 400 MHz and radiolocation systems in 3 100-3 400 MHz”
* Document 5D/353 ““Reply Liaison Statement to Working Party 5D (Copy To Working Parties 3K, 3M, 4А, 4В, 4С, 5А, 5В, 5C and 7B for information)”, 5 October 2020
* Document 7C/110 “Reply Liaison Statement to Working Party 7C”, 22 October 2020
* ITU-R CPM23.2 Report: Final CPM Report for WRC-23, 21 April 2023

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

* ECC Decision (11)06: Harmonised frequency arrangements and least restrictive technical conditions (LRTC) for mobile/fixed communications networks (MFCN) operating in the band 3400-3800 MHz;
* ECC Report 173 on Fixed Service in Europe Current use and future trends post 2022 (revised June 2023);
* ECC Report 203 on the Least Restrictive Technical Conditions suitable for Mobile/Fixed Communication Networks (MFCN), including IMT, in the frequency bands 3400-3600 MHz and 3600- 3800 MHz (issued in 2013);
* ECC Report 254 on the Operational guidelines for spectrum sharing to support the implementation of the current ECC framework in the 3600-3800 MHz range (issued in 2016);
* ECC Report 281 on the Analysis of the suitability of the technical regulatory conditions for 5G MFCN operation in the 3400-3800 MHz band. (issued in 2018);
* ECC Report 303 on the Guidance to administrations for Coexistence between 5G and Fixed Links in the 26 GHz band ("Toolbox")
* CEPT Report 15 in response to the first EC Mandate on 3400-3800 MHz (issued in 2006);
* CEPT Report 49 in response to the second EC Mandate on 3400-3800 MHz (issued in 2012);
* CEPT Report 67 in response to the EC Mandate to CEPT to develop harmonised technical conditions for spectrum use in support of the introduction of next-generation (5G) terrestrial wireless systems in the Union (issued in 2018).

EU Documentation (Directives, Decisions, Recommendations, other), if applicable

* Decision (EU) 2019/235: Commission Implementing Decision (EU) 2019/235 of 24 January 2019 on amending Decision 2008/411/EC as regards an update of relevant technical conditions applicable to the 3400-3800 MHz frequency band

# Actions to be taken

* Review positions of other Regions

# Relevant information from outside CEPT

## RADIO SPECTRUM POLICY GROUP (December 2022)

RSPG recommends that the Commission should clarify explicitly the intention for EU to consider, by 2024 or later, the best usage of the frequency band 6 425-7 125 MHz for wireless broadband in the future: either IMT, or WAS/RLAN or a shared framework between IMT and WAS/RLAN, possibly depending on the portion of this frequency band, noting that an IMT identification does not exclude other use of the band, for example a shared future use between IMT and WAS/RLAN or WAS/RLAN alone.

RSPG recommends that the EU position should be to accept an IMT identification at WRC-23, while not advocating for it or proactively supporting it, in all or portion of the band 6 425-7 125 MHz and only if the following conditions are met:

* that the protection of incumbent services and applications in the band 6 425-7 125 MHz is ensured through relevant RR provisions
* that the negotiations under Agenda Item 10 relating to IMT candidate bands between 7 and 30 GHz are successful to preserve the EU interest (see section 4.9).

RSPG also considers that an IMT identification may, depending on the WRC-23 negotiation and under the same conditions as outlined above, be limited to a portion of the band 6 425-7 125 MHz.

It is noted that the RSPG intends to include the issue of the future use (which could entail IMT, WAS/RLAN or a shared framework between IMT and WAS/RLAN) of the band 6 425-7 125 MHz into the RSPG Work Programme, taking into account -among others- the outcome of CEPT studies for this band.

Given the global interest of Member states in the frequency bands 3.3-3.4 GHz and 10 GHz, the RSPG recommends that the EU Member States should oppose to any IMT identification in the bands 3.3-3.4 GHz and 10-10.5 GHz as a common policy approach.

These recommendations are falling under case b).

## Regional telecommunication organisations

APT (August 2023)

Band 1 - 3 300-3 400 MHz (amend footnote in Region 1)

The APT has considered Band 1 - 3 300-3 400 MHz (amend footnote in Region 1) but has not developed a Preliminary APT Common Proposal on the matter. The APT has however formed the following view(s) on this frequency band.

APT Members are of the view that any possible IMT identification in the frequency band 3 300-3 400 MHz in Region 1 needs to protect the services to which the frequency band is allocated on a primary basis, and services in adjacent bands in Region 3 so that these services need to in no way be adversely affected.

APT Members are of the view that the amendments of footnotes in Region 1 should not cause any change to the existing regulatory conditions in Radio Regulations for Region 3.

Band 2 - 3 300-3 400 MHz (Region 2)

The APT has considered Band 2 - 3 300-3 400 MHz (Region 2) but has not developed a Preliminary APT Common Proposal on the matter. The APT has however formed the following view(s) on this frequency band.

APT Members are of the view that any possible IMT identification in the frequency band 3 300-3 400 MHz in Region 2 need to protect the services to which the frequency band is allocated on a primary basis, and services in adjacent bands in Region 3 so that these services need to in no way be adversely affected.

Band 3 - 3 600-3 800 MHz (Region 2)

The APT has considered Band 3 - 3 600-3 800 MHz (Region 2) but has not developed a Preliminary APT Common Proposal on the matter. The APT has however formed the following view(s) on this frequency band.

APT Members are of the view that any possible IMT identification in the frequency band 3 600-3 800 MHz in Region 2 needs to not impact the services to which the frequency band is allocated on a primary basis and in adjacent bands in Region 3 so that these services need to in no way be adversely affected.

Band 4 - 6 425-7 025 MHz (Region 1)

The APT has considered Band 4 - 6 425-7 025 MHz (Region 1) but has not developed a Preliminary APT Common Proposal on the matter. The APT has however formed the following view(s) on this frequency band.

APT Members are of the view that any possible IMT identification in the frequency band 6 425-7 025 MHz in Region 1 need to protect the services to which the frequency band is allocated on a primary basis and services in the adjacent bands in Region 3, in particular, the uplink of Appendix 30B bands so that these services need to in no way be adversely affected.

Band 5 - 7 025-7 125MHz (globally)

The APT has considered Band 5 - 7 025-7 125MHz (globally) and drafted a Preliminary APT Common Proposal on the matter.

APT Members support IMT identification in the frequency band 7 025-7 125 MHz through Method 5C together with a new WRC Resolution.

Band 6 - 10 000-10 500 MHz (Region 2)

The APT has considered Band 6 - 10 000-10 500 MHz (Region 2) but has not developed a Preliminary APT Common Proposal on the matter. The APT has however formed the following view(s) on this frequency band.

APT Members are of the view that any possible IMT identification in the frequency band 10.0-10.5 GHz in Region 2 need to protect the services to which the frequency band is allocated on a primary basis and in adjacent bands in Region 3 so that these services need to in no way be adversely affected.

ATU (September 2023)

Part 1: Common position:

For the frequency Band 1 (3 300 – 3 400 MHz):

Support Method 1F

Not support methods 1A and 1B, which will result in maintaining the current regulatory situation.

For the frequency Band 4 (6 425 – 7 025 MHz); Band 5 (7 025 – 7 125 MHz):

Support Methods 4C and 5C (alternative 2), to identify the frequency band 6 425 – 7 125 MHz to IMT with the following set of conditions to protect incumbent services:

For the protection of FSS (earth-to-space) in the frequency band 6 425-7 075 MHz – Mask for the expected equivalent isotropically radiated power (e.i.r.p.) emitted by an IMT base station: Example 3 of the draft resolution associated with method 4C/5C;

For the protection of FSS (space-to-Earth) in the frequency band 6 700-7 075 MHz: through the adoption of site-specific coordination.

For frequency Band 2 (3 300-3 400 MHz); Band 3 (3 600-3 800 MHz) and Band 6 (10 – 10.5 GHz (Region 2)):

For frequency band 2 and frequency band 3, support allocation to mobile service, and possible IMT identification in these frequency bands under consideration in Region 2, considering that this would foster global harmonization for the implementation of IMT;

For frequency band 6, support that IMT identification of this frequency band or part thereof under consideration in Region 2, shall not affect services to which this frequency band is allocated to in Region 1.

Part 2: Way forward

Request ATU administrations to:

Support the AfCP under this agenda item.

Arab Group (September 2023)

•3300-3400 MHz band (Region 1): (ACP) to Support Primary allocation to the mobile service in the frequency band 3 300- 3 400 MHz in the Table of Frequency Allocations and identification to IMT in Region 1 without any condition.

•3300-3400 MHz band (Region 2): Ensure not affecting or imposing any additional restrictions on services allocated in Region 1.

•3600-3800 MHz band (Region 2): Support the use of this band for IMT within the mobile service and to align the possible conditions for the use of this band for IMT between Regions 1 and 2.

•6425-7025 MHz band (Region 1): (ACP) to support Method 4B to identify the frequency bands 6425-7025 MHz in Region 1 for IMT and further coordinate at ASMG level to develop possible protection conditions for existing services and discuss possible coexistence measures with other in-band operating applications.

•7125-7125 MHz band: (ACP) to support Method 5B to identify the frequency bands 7025-7125 MHz in Region 1 for IMT and further coordinate at ASMG level to develop possible protection conditions for existing services and discuss possible coexistence measures with other in-band operating applications.

•10.0-10.5 GHz band (Region 2): Ensure not affecting or imposing any additional restrictions on services allocated in Region 1.

CITEL (September 2023)

3 300-3 400 MHz

Inter- American Proposal – already posted in the WRC-23 contributions (Doc. 44 Add. 2 Add.1)

• Allocation to the mobile (except aeronautical mobile) service and identification for IMT in Region 2 in the band 3 300-3 400 MHz by modification of 5.429C, 5.429D and the addition of 5.12AI:

• 5.12AI Stations in the mobile service operating in the frequency band 3 300-3 400 MHz in Region 2 shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. 3 600-3 800 MHz

Inter-American Proposals

• Modification of 5.434 to extend the existing IMT footnote(s) to the entire Region 2 for the identification of the frequency band 3 600-3 700 MHz for IMT, removing existing conditions and adding the sentence: Administrations wishing to implement IMT shall obtain the agreement of neighboring countries to ensure the protection of the fixedsatellite service (space-to-Earth).

• Add a new footnote for some countries in Region 2 for the identification of the frequency band 3 700-3 800 MHz for IMT, adding the sentence: Administrations wishing to implement IMT shall obtain the agreement of neighboring countries to ensure the protection of the fixed-satellite service (space-to-Earth).6 425-7 125 MHz

Inter-American Proposal

• Administrations propose NOC for the identification of the frequency band 6 425-7 125 MHz for IMT in all Regions.

RCC (September 2023)

The RCC Administrations are of the view that the identification of the possibility and conditions for the frequency bands allocations to the Mobile Service on a primary basis and/or their identification for IMT shall be based on the results of relevant ITU-R sharing and compatibility studies, taking into account the current and planned use of the considered and adjacent frequency bands.

3300−3400 MHz (Regions 1 and 2) For Region 1

The RCC Administrations support the eventual WRC-23 decision on this frequency band, based on Method 1A or 1B of the CPM Report on agenda item 1.2, and, at the same time, the RCC Administrations are in favor of protection of radiolocation service in the frequency band 3 300- 3 400 MHz, as well as protection of Fixed Satellite Service (FSS) in adjacent frequency band 3 400- 4 200 MHz, when including any countries from Region 1 into the footnotes 5.429, 5.429A, 5.429B, 5.429C, 5.429D, 5.429E, 5.429F of Article 5 of the Radio Regulations. Protection of radiolocation service stations and FSS stations shall be provided on the basis of the results of ITU-R studies, carried out in preparation for the WRC-15 (including Reports ITU-R M.2481 and S.2368).

For Region 2. The RCC Administrations support the eventual WRC-23 decision on this frequency band, based on Method 2A or 2C of the CPM Report on agenda item 1.2, and, at the same time, the RCC band 3300-3400 MHz, as well as protection of Fixed Satellite Service in Region 1 in the frequency band 3 400-4 200 MHz, when identifying the frequency band 3 300-3 400 MHz in Region 2 for IMT systems, taking into account the results of the ITU-R studies, carried out in preparation for the WRC-23.

3600−3800 MHz (Region 2)

The RCC Administrations support the eventual WRC-23 decision on this frequency band, based on Method 3A or 3D of the CPM Report on agenda item 1.2, and, at the same time, the RCC Administrations are of the view that, in the case of identifying this frequency band for IMT systems in Region 2, it is necessary to adopt such RR provisions, which provide protection to FSS and FS in Region 1. Protection shall be provided based on the results of the studies carried out in ITU-R in preparation for WRC-07, WRC-12 and WRC-15 (including Report ITU-R F.2328, Report ITU-R M.2109, Report ITU-R S.2199, Report ITU-R S.2368 and Report ITU-R M.2111), taking into account the results of new ITU-R studies on IMT compatibility with FSS earth stations, FS stations in the frequency band 3 600-3 800 MHz.

6425−6525 MHz (Region 1)

The RCC Administrations support the eventual WRC-23 decision on this frequency band, based on Method 4D of the CPM Report on agenda item 1.2. In the case of identification of the frequency band 6 425-6 525 MHz (Region 1) or its individual parts for IMT systems, no additional regulatory and technical restrictions shall be imposed on FSS earth stations and FS stations.

6525−7025 MHz (Region 1), 7025−7100 MHz (Regions 1, 2 and 3)

The RCC Administrations are in favor of identifying the frequency band 6 525−7 025 MHz, or individual parts thereof, for IMT systems, taking into account the results of the ITU-R sharing and compatibility studies. The identification of frequency band 6525−7100 MHz, or individual parts thereof, for IMT systems can be under the following conditions:

• compatibility of IMT stations with non-GSO MSS (s-E) feeder links in the frequency band 6700-7075 MHz;

• compatibility of IMT stations with FSS space stations on GSO and HEO in the frequency band 6725-7025 MHz;

• retaining the possibility to further use the EESS (passive) in the frequency band 7075-7250 MHz.

The RCC Administrations are of the view that unwanted emissions from IMT stations shall comply with the requirements of Recommendation SM.329 for Category B. Moreover, the identification of frequency band 6525−7100 MHz for IMT systems shall not impose additional regulatory or technical restrictions on FS stations, operating in this frequency band, as well as on SOS and SRS stations, operating in the frequency band 7100-7250 MHz. Protection of radio astronomy service in the frequency band 6650–6675.2 MHz shall be provided based on the provisions of footnote 5.149 RR, and the adoption of additional measures is not required.

7100−7125 MHz (Regions 1, 2 and 3)

In the case of identification of the frequency band 7100−7125 MHz, or individual parts thereof, for IMT systems, the RCC Administration are: - in favor of ensuring the interference protection to stations in existing radio services in the same and adjacent frequency bands (including FS stations, as well as space stations of SOS, SRS and EESS (passive)); - against any additional regulatory and/or technical restrictions on the use of FS, SRS and SOS stations.

10.0 −10.5 GHz (Region 2)

The RCC Administrations support the eventual WRC-23 decision on this frequency band, based on Method 6A or 6C of the CPM Report on agenda item 1.2, and, at the same time, the RCC Administrations are in favour of ensuring the protection to services for which the frequency band 10−10.5 GHz is allocated within Region 1, as well as the protection to EESS (passive) in the frequency band 10.6-10.7 GHz. In the case of allocation of the frequency band 10.0–10.5 GHz, or individual parts thereof, to the Mobile Service and its identification for IMT systems in Region 2, no additional regulatory and technical restrictions shall be imposed on stations of other services, operating in accordance with RR in the same and adjacent frequency bands.

## International organisations

ICAO (July 2023)

To ensure that any IMT identification in the Region 2 in the frequency bands 3 600-3 800 MHz would include technical conditions to protect FSS in order to continue the use of these bands by the FSS for the provision of aeronautical services. In case of any IMT identification in the frequency band 6 425-6 575 MHz in Region 1, regulatory provisions would be required for protecting FSS uplinks in order to continue the use of these bands by GSO FSS networks used for the provision of aeronautical services. In case of any IMT identification in the frequency band 6 425-6 700 MHz in Region 1, to ensure that the flight test operations in accordance with Resolution 416 (WRC-07) would not be affected in Region 2.

NATO (September 2023)

NATO Military Interest Statement

Access to the NATO harmonised NJFA frequency ranges 3 300-3 400 MHz for radiolocation service and 10-10.5 GHz for SAR applications in the EESS (active) and radiolocation service are essential. Any implementation of IMT in these ranges will limit/degrade the utilisation for systems in support of NATO in various national and international operational environments, e.g., airborne and naval radars.

Furthermore, NATO forces are in the C-Band (VSAT) customer of the provider of FSS capabilities.

NATO Position Statement

NATO does not support changes to any regulatory provisions including those for IMT that will lead to additional constraints on incumbent services in regard of a possible identification for IMT:

* in the range 3 300-3 400 MHz for Region 1 and Region 2
* in the range 10-10.5 GHz for Region 2.

SFCG (June 2023)

SFCG does not support an IMT identification in any of the 6425-7025 MHz, 7025-7125 MHz, or 10.0-10.5 GHz frequency bands, which corresponds to Methods 1A, 2A, 3A, 4A, 5A, and 6A in the CPM Report.

However, if an identification to IMT is made in the band 10-10.5 GHz in Region 2, SFCG would support that technical and regulatory conditions should be applied to IMT in order to adequately protect:

- EESS (active) in the band 10-10.4 GHz (limits on IMT in-band power and use of the sidelobe suppression technique whose feasibility should be demonstrated);

- EESS (passive) in the band 10.6-10.7 GHz (proposed limits in the CPM Report under Methods 6B/6C on IMT unwanted emissions of -43.0 dBW in 100 MHz for IMT base station (BS) and of -41.0 dBW in 100 MHz for IMT user equipment (UE) are supported;

- and RAS in the band 10.6-10.7 GHz.

If an identification to IMT is made in the band 7025-7125 MHz, SFCG would support that it should adequately protect and not impose any additional regulatory or technical constraints on:

- SOS in 7100-7155 MHz (in accordance with RR No. 5.459);

- SRS (deep space) in the band 7 145-7 190 MHz, for current and future operations of deep space earth stations.

This could be accomplished through support for Method 5D which provides text to identify the frequency band 7 025-7 100 MHz for IMT by creating a new RR footnote with a requirement to implement technical and regulatory measures to protect and not impose constraints on existing services in the band above 7 100 MHz.

SFCG supports compatibility and sharing studies within ITU-R WP 7C to assess the potential impact of IMT deployment, in addition to other active services, in the band 6 425-7 125 MHz on EESS (passive) sensors (operating under RR No. 5.458) with a view to identifying options to ensure continuity of sea surface temperature (SST) measurements in the EESS (passive) in the long-term. In this respect, SFCG requests that WRC-23 considers new primary allocations to EESS (passive) in the 4200-4400 MHz and 8400-8500 MHz bands for SST measurements.

WMO and EUMETNET (June 2023)

WMO is not in favour of an IMT identification in the 6425–7025 MHz or 7025–7125 MHz frequency bands. However, if an identification to IMT is made in the 6425–7025 MHz and/or 7025–7125 MHz frequency bands, WMO would like to highlight that:

* Sea-surface temperature (SST) measurements performed in these frequency bands are of prime importance for weather forecasting and climate monitoring. WMO understands that footnote RR No 5.458 does not provide an EESS (passive) allocation in the 6425–7075 MHz and 7075–7250 MHz frequency bands and thus no regulatory protection for SST measurement is granted in these frequency bands
* due to their importance, WMO encourages administrations to elaborate solutions in order to ensure the continuation of SST measurements. Methods 4E and 5E in the CPM Report propose a delay in the use of the 6425–7075 MHz and 7075–7250 MHz frequency bands by IMT to enable the migration of some other services, including EESS (passive)
* taking into account studies performed in WP 7C, WRC-23 could consider the possibility of new primary EESS (passive) allocations in the 4–10 GHz frequency range (4.2–4.4 GHz and 8.4–8.5 GHz bands) in which SST measurements can also be performed.

WMO opposes IMT identification in 10.0–10.5 GHz. However, if an identification to IMT is made in the 10.0 – 10.5 GHz frequency band in Region 2, WMO would require:

* The application of appropriate regulatory provisions in the 10.6–10.7 GHz frequency band, with necessary limits to protect EESS (passive) operations from unwanted emissions from IMT operating within the 10.0–10.5 GHz band. WMO believes that the limits proposed in the CPM Report under Methods 6B/6C (-43 and -41 dBW/100 MHz for BS and UE, respectively) would provide adequate protection.
* The application of appropriate regulatory provisions to protect EESS (active) operations within the 10.0–10.4 GHz band.
* That the effectiveness of the mitigation techniques (e.g. suppression side lobes) to ensure the protection of EESS (active) and EESS (passive) is proven and the appropriately implemented in the RR.

## Other organisations

ACEA (January 2023)

The European Automotive industry does not support the identification of the frequency bands 6425-7025 MHz and 7025-7125 MHz for IMT. The Automotive industry uses these bands for UWB-based key fobs and secure “Digital Keys”, that provide for a replacement of classical keys by smartphone-enabled ones. Therefore, ACEA supports a no change for these bands, thus protecting millions of applications.

CRAF (September 2023)

* CRAF supports no change for the band 6 425–7 025 MHz (Method 4A). Although the CRAF studies for the protection of the RAS band 6 650–6 675.2 MHz under RR No. 5.149 were deemed out of the scope of the agenda item, the potential impact of new allocations to IMT in these bands should be considered in order to protect European RAS operations. Studies initiated at WP7D can provide assistance to the CEPT administrations in evaluating the impact.
* Any IMT identification in Region 1 in the band 6 425–7 025 MHz should include the necessary provisions to ensure the continuity of the important RAS operations in the 6 650–6 675.2 MHz band. Methods 4C and 4E are favoured in case of identification, with preference of 4E due to the later operating date.

DIGITAL EUROPE (April 2022)

• 3300 – 3400 MHz amend footnote in Region 1 DIGITALEUROPE supports additions of Region 1 countries to the relevant footnotes to the extent that compatibility matters are resolved, and further noting the possibility of an ecosystem developing considering use in other parts of the world and considering different deployment alternatives.

• 3300 – 3400 MHz in Region 2 DIGITALEUROPE notes the availability of an ecosystem in the range 3300-3800 MHz and that IMT identification in R2 will not affect R1. DIGITALEUROPE suggests CEPT to stay neutral in relation to IMT identification in Region 2.

• 3600-3800 MHz in Region 2 DIGITALEUROPE observes that additional IMT identification would further harmonize the usage of one of the 5G pioneer bands for Europe and thus benefit the development of the ecosystem. DIGITALEUROPE encourages Europe to welcome efforts for global harmonization.

• 6425 – 7025 MHz and 7025 – 7125 MHz DIGITALEUROPE observes that there is a strong interest from both the Mobile/IMT community and the WAS/RLAN community.

EBU (October 2022)

EBU notes that this agenda item seeks to identify further “mid band” spectrum for IMT. The candidate bands identified in Resolution 245 have different uses in different ITU Regions, and the agenda item has distinct conditions for each:

* 3 300-3 400 MHz and 3 600-3 800 MHz (Region 2);
* 3 300-3 400 MHz (Region 1 – agenda item limited to amending the existing footnote);
* 6 425-7 025 MHz (Region 1);
* 7 025-7 125 MHz (globally);
* 10.0-10.5 GHz (Region 2),

Broadcasters have examined these bands, and have so far identified the following uses:

* 3 600-3 800 MHz (Region 2) – C-Band satellite downlink channels. In parts of Region 2, these bands are no longer used for broadcasters’ distribution and contribution or are being withdrawn from such use. In the remaining cases, there is often no suitable alternative satellite spectrum available to replace any loss particularly in areas subject to high rainfall rates.
* 7 025-7 125 MHz – The EBU notes that in the ERC Recommendation 25-10 the frequency band 7 000-8 500 MHz is recommended for video PMSE applications such as cordless cameras, portable video links, mobile video links, and temporary point-to-point video links. Some of these applications are used for Electronic Newsgathering (ENG) in various parts of the world (terrestrial applications of the mobile service).

The EBU position is that broadcasters’ use of the parts of the bands identified above should be protected. In particular, the EBU is of the view that PMSE applications operating in the band 7 000-7 125 MHz need to be protected and should have the possibility to continue to operate in this band.

ESA (June 2023)

ESA supports the SFCG position on this WRC-23 Agenda Item.

GSOA (1 September 2023)

3600-3700 MHz (Region 2)

GSOA supports No Change to the ITU RR for 3600-3800 MHz in R2 but recognizes the various preferences for the use of 3600-3700 MHz in R2. GSOA is of the view that countries deciding to identify IMT up to 3700 MHz can include their names in footnote 5.434 instead of identifying the band regionally for IMT.

6425-7025 MHz (Region 1) 7025-7125 MHz (globally)

GSOA position is No Change to the ITU RR. Using 6425-7025 MHz in R1 and 7025-7075 MHz globally for IMT would lead to excessive interference making these bands unusable for FSS.

10000-10500 MHz (Region 2)

GSOA position is No Change to the ITU RR. If an IMT identification was considered in 10-10.5 GHz, the conditions to protect the EESS services globally should also include IMT unwanted/OOB emission limits to protect FSS above 10.7 GHz.

ETNO (May 2022)

ETNO supports IMT identification for the bands considered under this agenda. In particular, 6425-7125 MHz is of great interest, as it would support meeting the future demands for mid-band spectrum for IMT in Europe.

According to a recent study from GSMA prepared by Coleago there is a large demand for mid-band spectrum for 5G in future, in total about 2 GHz by 2030. In Europe the band 6425-7125 MHz is the only realistic opportunity for making available new mid-band spectrum allowing for sufficiently wide contiguous bandwidth per operator. This band will be needed especially in urban areas (e.g. for outdoor-to-indoor and city-wide coverage) and to enable more advanced 5G services to a larger part of the population in areas which are not feasible to be covered with mmWave bands.

An IMT identification for this band enables equipment ecosystem development, and thus creates a possibility for countries to allow mobile IMT use when and where feasible. It is foreseen that sharing of macro cellular networks with existing services is feasible, noting that it is possible to set conditions in licenses to protect existing services as needed.

ETNO supports an IMT identification for 6425-7125 MHz at WRC-23. In addition, ETNO is of the view that CEPT should not block countries in Region 2 or other parts of Region 1 from having an IMT identification for the bands which are not relevant for IMT in Europe.

EUMETSAT (September 2023)

"EUMETSAT supports the WMO and SFCG positions and would like to specifically stress that the band 6425-7250 MHz is a unique frequency range for EESS (passive) sensors, since it corresponds to the peak sensitivity to sea surface temperature. One of the sensors using or planning to use this band is the Copernicus Imaging Microwave Radiometer, CIMR, which is one of the high-priority missions for the expansion of the EU Copernicus programme."

Eurocontrol (September 2023)

To ensure that any IMT identification in the Region 2 in the frequency bands 3 600-3 800 MHz would include technical conditions to protect FSS in order to continue the use of these bands by the FSS for the provision of aeronautical services. In case of any IMT identification in the frequency band 6 425-6 575 MHz in Region 1, regulatory provisions would be required for protecting FSS uplinks in order to continue the use of these bands by GSO FSS networks used for the provision of aeronautical services. In case of any IMT identification in the frequency band 6 425-6 700 MHz in Region 1, to ensure that the flight test operations in accordance with Resolution 416 (WRC-07) would not be affected in Region 2.

GSMA (April 2021)

3 300-3 400 MHz and 3 600-3 800 MHz

* 3.4-3.8 GHz is the primary band that is being used for initial 5G network deployments in Europe. Spectrum in the 3.5 GHz range (3.3-3.8 GHz) is the 5G launch band in most countries around the world, and as such it has the deepest ecosystem and most affordable devices. The GSMA believes that countries in Region 2 should have the opportunity to take advantage of the band 3 600-3 800 MHz by means of an IMT identification. Furthermore, although CEPT may not wish to use the band 3 300-3 400 MHz for IMT, CEPT should not block countries in Region 2 and other parts of Region 1 from having an IMT identification in this band.

6 425-7 125 MHz

* The 6 GHz range is a high priority for the GSMA, and our members in all three Regions support 5G in the band. The GSMA believes that 6 GHz is the most viable range to fulfil mid-band spectrum needs in the longer term for the future of 5G expansion. As such, the bands 6 425-7 025 MHz and 7 025-7 125 MHz should be identified for IMT at WRC-23 in Region 1 (and 7 025-7 125 MHz globally).

10-10.5 GHz

* The band 10-10.5 GHz is being studied as a potential supplement to provide capacity in Region 2. The GSMA believes that this band could provide valuable additional capacity for IMT, and that CEPT should not block countries in Region 2 that wish to do so from having an IMT identification in this band.

IARU (March 2021)

The IARU opposes the identification of the band 10.0-10.5 GHz for IMT in Region 2 as well as the introduction of a mobile service allocation in the region, which would be a necessary precursor to its identification for IMT. Spectrum sharing with a mass market deployment of mobile systems can be challenging and experiences have shown that the legal implications of national IMT licensing processes and service provider requirements tend to result in removal of national amateur service assignments which can severely affect the development of amateur radio.

Considering j) of Resolution 245 (WRC-19) notes that harmonized worldwide arrangements for IMT are “highly desirable;” it logically follows that an undesirable regional identification for IMT must be weighed against the continuing requirements of incumbent services. While studies are only invited with regard to the protection of primary services, considering k) and l) and recognizing c) of the resolution make no distinction between primary and secondary allocations with regard to the need to protect existing services. The use and evolving needs of the amateur and amateur-satellite services must not be overlooked as an undesirable regional arrangement for IMT is being considered. The IARU requests that the special status of 10.45-10.5 GHz as a worldwide amateur-satellite allocation with no mobile allocation be respected.

Wi-Fi Alliance (November 2022)

An IMT identification in the 6.425-7.125 GHz band would impair current and future Wi-Fi generations worldwide. Wi-Fi Alliance supports:

* No change (NOC) for the band 6 425-7 025 MHz in Region 1
* No change (NOC) for the band 7 025-7 125 MHz

Regulators worldwide (e.g., [Canada](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11643.html), [Chile](https://www.bcn.cl/leychile/navegar?idNorma=1109333&idParte=9841504&idVersion=&r_c=6), [Japan](https://www.soumu.go.jp/main_content/000716599.pdf), [South Korea](https://www.msit.go.kr/web/msipContents/contentsView.do?cateId=_policycom2&artId=3140715), [US](https://www.fcc.gov/document/fcc-opens-6-ghz-band-wi-fi-and-other-unlicensed-uses-0)) are enabling next generation Wi-Fi (i.e., [Wi-Fi 6E](https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-brings-wi-fi-6-into-6-ghz)) in the 5.925-7.125 GHz band. Wi-Fi 6E is intended to support high-throughput, low-latency applications using wider channels accommodated in contiguous spectrum blocks available in this frequency range. Wi-Fi Alliance is seeing strong demand and adoption of Wi-Fi 6E devices in the consumer, enterprise, and industrial environments. Market projections indicate that, prior to WRC-23, shipments will exceed a billion Wi-Fi 6E devices per year. Importantly, multiple sharing studies confirm that introduction of license-exempt services with appropriate constraints in the 5.925-7.125 GHz band does not impact existing services such as Fixed (point-to-point) links and FSS uplinks. Wi-Fi Alliance notes that the 5.925-7.125 GHz band is already allocated to the mobile service. Therefore, Wi-Fi Alliance is of the view that WRC action is not required for deployment of mobile applications such as 5G, RLAN, etc. On the contrary, IMT identification in the 6.425-7.075 GHz (Region 1) or 7.025-7.125 GHz bands would counter the goal of international harmonization, impede ongoing technological developments, and foster regulatory uncertainty.

1. Technical and Regulatory conditions applicable to IMT to protect incumbent services in the 10-10.5 GHz band, in case of an IMT identification

This Annex is needed only if there is an IMT identification in the band 10–10.5 GHz in Region 2.

Agenda Item 1.2 considers, among others, possible identification of the frequency band 10.0–10.5 GHz, or parts thereof, for International Mobile Telecommunications (IMT) in Region 2. This consideration shall be accompanied by the appropriate protection of Earth Exploration Satellite Service (EESS) (active) in the band 10–10.4 GHz, Radiolocation Service in the band 10–10.5 GHz, Earth Exploration Satellite Service (EESS) (passive) in the band 10.6–10.7 GHz and Radioastronomy service in the band 10.68–10.7 GHz.

Since sharing and compatibility studies between IMT and other services were conducted for IMT stations in the land mobile service and not in the aeronautical mobile service, any allocation of the band 10-10.5 GHz should be limited to the Mobile Service except aeronautical.

In order to cover the protection of any radiolocation system per scanning angle, in particular for those in the direction of the sources of interference, the guidance from WP 5B “to take into account the interference received by the radar only when pointing in the direction of the IMT deployment” was followed. Moreover, when an airborne radar is located close to the horizon of the IMT network, the aggregate emissions level of IMT stations is dominated by the main lobe of some BSs antenna, leading Sidelobe Suppression Level (SSL) technique unable to mitigate the aggregate interference from BS towards the airborne receiver.

Similar conclusion about the inefficiency of the SSL interference mitigation technique could be drawn in adjacent band (10.6-10.7 GHz) for the protection of EESS passive when noticing that:

* Recommendation ITU-R M.2101 states that in an adjacent frequency band situation with IMT as the interfering system, the antenna pattern for the unwanted emission can be assumed to have a similar antenna pattern as a single antenna element;
* the results of the sharing studies with the single element model for the AAS show more stringent levels of unwanted emissions compared to the beamforming model;
* SSL only applies for a beamforming model of the AAS.

Consequently, a power limit applied to IMT stations would handle the above issue and would also clear the uncertainty related to the deployment topology in light of the work undertaken by external organization within 10-10.5 GHz[[3]](#footnote-3), to offer, on a long-term basis, the protection of Radiolocation Service as well as EESS active.

This would lead to the following elements related to Method 6C in the draft CPM Report to modify the Radio Regulations:

ARTICLE 5 Frequency allocations (Section IV –Table of Frequency Allocations (See No. 2.1))

10-10.7 GHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 10-10.4  EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C  FIXED  MOBILE  RADIOLOCATION  Amateur | 10-10.4  EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C  MOBILE except aeronautical mobile  RADIOLOCATION  Amateur | 10-10.4  EARTH EXPLORATION-SATELLITE (active) 5.474A 5.474B 5.474C  FIXED  MOBILE  RADIOLOCATION  Amateur |
| 5.474D 5.479 | 5.474D 5.479 MOD 5.480 ADD 5.E12 ADD 5.F12 ADD 5.G12 | 5.474D 5.479 |
| 10.4-10.45  FIXED  MOBILE  RADIOLOCATION  Amateur | 10.4-10.45  MOBILE except aeronautical mobile  RADIOLOCATION  Amateur | 10.4-10.45  FIXED  MOBILE  RADIOLOCATION  Amateur |
|  | MOD 5.480 ADD 5.E12 ADD 5.F12 ADD 5.G12 |  |
| 10.45-10.5  RADIOLOCATION  Amateur  Amateur-satellite | 10.45-10.5  MOBILE except aeronautical mobile  RADIOLOCATION  Amateur  Amateur-satellite | 10.45-10.5  RADIOLOCATION  Amateur  Amateur-satellite |
| 5.481 | MOD 5.481 ADD 5.E12 ADD 5.F12 ADD 5.G12 | 5.481 |

Article 5 RR Footnotes:

MOD

5.480 Additional allocation:  in Argentina, Brazil, Chile, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Paraguay, the overseas countries and territories within the Kingdom of the Netherlands in Region 2, Peru and Uruguay, the frequency band 10‑10.45 GHz is also allocated to the fixed and aeronautical mobile services on a primary basis. In Colombia, Costa Rica, Mexico and Venezuela, the frequency band 10‑10.45 GHz is also allocated to the fixed service on a primary basis.     (WRC‑23)

MOD

5.481 Additional allocation:  in Algeria, Germany, Angola, China, Côte d’Ivoire, Egypt, Spain, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Pakistan, the Dem. People’s Rep. of Korea, Romania and Tunisia, the frequency band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis. In Brazil, Costa Rica, El Salvador, Ecuador, Guatemala, Paraguay, Peru and Uruguay, the frequency band 10.45-10.5 GHz is also allocated to the fixed and aeronautical mobile services on a primary basis.     (WRC‑23)ADD

5.E12 In Region 2, the frequency band 10-10.5 GHz, is identified for use by administrations wishing to implement the terrestrial component of International Mobile Telecommunications (IMT). This identification does not preclude the use of this frequency band by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. Resolution [C12-10GHz] (WRC-23) applies.     (WRC-23)

ADD

5.F12 In Region 2, IMT stations operating in the frequency band 10-10.5 GHz, stations of the mobile service in Region 2 countries not listed in No. 5.480 in the frequency band 10-10.45 GHz and stations of the mobile service in Region 2 countries not listed in No. 5.481 in the frequency band 10.45-10.5 GH shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service.      (WRC-23)

Materials related to the WRC-23 Resolution dealing with the frequency bands 10–10.5 GHz in Region 2.

The World Radiocommunication Conference (Dubai, 2023),

recognizing that the use of the frequency band 10-10.5 GHz for IMT is only intended for microcell base stations,

resolves:

1 that administrations shall take practical measures to ensure that transmitting antennas of outdoor base stations are pointing below the horizon, when deploying IMT base stations within the frequency band 10-10.5 GHz; the mechanical pointing needs to be at or below the horizon;

[To protect EESS (active) and Radiolocation services]

2 that the power delivered by a transmitter to the antenna of a station; or the total radiated power (TRP) of IMT stations that use an antenna that consists of an array of active elements, shall not exceed 29 dBm;

2 bis that the maximum e.i.r.p. of the IMT base stations antenna shall not exceed 25 dBm for all elevation angles above 34 degrees,

[To protect EESS (passive)]

3 that, for the purposes of protecting the Earth exploration-satellite service (EESS) (passive), the unwanted emission level per IMT base station shall not exceed [−58.9 dBWdBW/100MHz] in the frequency band 10.6-10.7 GHz;

4 that, for the purposes of protecting the Earth exploration-satellite service (EESS) (passive), the unwanted emission level per IMT user equipment shall not exceed [−54.9 dBW/100MHz] in the frequency band 10.6-10.7 GHz;

[To protect Radioastronomy]

5 that the power flux received at such radio astronomy stations in the band 10.68-10.7 GHz by these stations shall not exceed –167 dB(W/m2),

1. Including studies with respect to services in adjacent bands, as appropriate. [↑](#footnote-ref-1)
2. Including studies with respect to services in adjacent bands, as appropriate. [↑](#footnote-ref-2)
3. Macro scenario was the only one to be addressed in a 3GPP Technical Report TR 38.921 [↑](#footnote-ref-3)