

## RESOLUTION 223 (REV.WRC-19)

**Additional frequency bands identified for International  
Mobile Telecommunications**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a) that International Mobile Telecommunications (IMT), including IMT-2000, IMT-Advanced and IMT-2020, is the ITU vision of global mobile access;
- b) that IMT systems provide telecommunication services on a worldwide scale regardless of location, network or terminal used;
- c) that IMT provides access to a wide range of telecommunication services supported by fixed telecommunication networks (e.g. public switched telephone network (PSTN)/integrated services digital network (ISDN), high bit rate Internet access), and to other services which are specific to mobile users;
- d) that the technical characteristics of IMT are specified in ITU Radiocommunication Sector (ITU-R) and ITU Telecommunication Standardization Sector (ITU-T) Recommendations, including Recommendations ITU-R M.1457 and ITU-R M.2012, which contain the detailed specifications of the terrestrial radio interfaces of IMT;
- e) that the evolution of IMT is being studied within ITU-R;
- f) that the review of IMT-2000 spectrum requirements at WRC-2000 concentrated on the frequency bands below 3 GHz;
- g) that at WARC-92, 230 MHz of spectrum was identified for IMT-2000 in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz, including the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz for the satellite component of IMT-2000, in No. **5.388** and under the provisions of Resolution **212 (Rev.WRC-19)**;
- h) that since WARC-92 there has been a tremendous growth in mobile communications including an increasing demand for broadband multimedia capability;
- i) that the frequency bands identified for IMT are currently used by mobile systems or applications of other radiocommunication services;
- j) that Recommendation ITU-R M.1308 addresses the evolution of existing mobile communication systems to IMT-2000, and that Recommendation ITU-R M.1645 addresses the evolution of the IMT systems and maps out their future development;
- k) that harmonized worldwide frequency bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;
- l) that the frequency bands 1 710-1 885 MHz, 2 500-2 690 MHz and 3 300-3 400 MHz are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations;

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- m)* that the frequency band 2 300-2 400 MHz is allocated to the mobile service on a co-primary basis in the three ITU Regions;
- n)* that the frequency band 2 300-2 400 MHz, or portions thereof, is used extensively in a number of administrations by other services including the aeronautical mobile service (AMS) for telemetry in accordance with the relevant provisions in the Radio Regulations;
- o)* that IMT has already been deployed or is being considered for deployment in some countries in the frequency bands 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz and equipment is readily available;
- p)* that the frequency bands 1 710-1 885 MHz, 2 300-2 400 MHz and 2 500-2 690 MHz, or parts thereof, are identified for use by administrations wishing to implement IMT;
- q)* that technological advancement and user needs will promote innovation and accelerate the delivery of advanced communication applications to consumers;
- r)* that changes in technology may lead to the further development of communication applications, including IMT;
- s)* that timely availability of spectrum is important to support future applications;
- t)* that IMT systems are envisaged to provide increased peak data rates and capacity that may require a larger bandwidth;
- u)* that ITU-R studies forecasted that additional spectrum may be required to support the future services of IMT and to accommodate future user requirements and network deployments;
- v)* that the frequency band 1 427-1 429 MHz is allocated to the mobile, except aeronautical mobile, service in all three Regions on a primary basis;
- w)* that the frequency band 1 429-1 525 MHz is allocated to the mobile service in Regions 2 and 3 and to the mobile, except aeronautical mobile, service in Region 1 on a primary basis;
- x)* that the frequency band 1 518-1 559 MHz is allocated in all three Regions to the mobile-satellite service (MSS) on a primary basis<sup>1</sup>;
- y)* that WRC-15 identified the frequency band 1 427-1 518 MHz for use by administrations wishing to implement terrestrial IMT systems;
- z)* that there is a need to ensure the continued operations of the MSS in the frequency band 1 518-1 525 MHz;
- aa)* that appropriate technical measures to facilitate adjacent frequency band compatibility between the MSS in the frequency band 1 518-1 525 MHz and IMT in the frequency band 1 492-1 518 MHz need to be studied;
- ab)* Report ITU-R RA.2332, on compatibility and sharing studies between the radio astronomy service and IMT systems in the frequency bands 608-614 MHz, 1 330-1 400 MHz, 1 400-1 427 MHz, 1 610.6-1 613.8 MHz, 1 660-1 670 MHz, 2 690-2 700 MHz, 4 800-4 990 MHz and 4 990-5 000 MHz;

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<sup>1</sup> See Table 21-4 for applicable pfd limits.

*ae)* that WRC-15 and this conference identified the frequency band 3 300-3 400 MHz for use by administrations wishing to implement terrestrial IMT systems in Nos. **5.429B**, **5.429D** and **5.429F**;

*ad)* that the frequency band 3 300-3 400 MHz is allocated worldwide on a primary basis to the radiolocation service;

*ae)* that a number of administrations use the frequency band 3 300-3 400 MHz, or portions thereof, which is allocated to the fixed and mobile services on a primary basis in No. **5.429**;

*af)* that the frequency band 4 800-4 990 MHz is allocated worldwide to the mobile and fixed services on a primary basis;

*ag)* that WRC-15 and this conference identified the frequency band 4 800-4 990 MHz for use by administrations wishing to implement terrestrial IMT systems in countries listed in Nos. **5.441A** and **5.441B**;

*ah)* that appropriate technical measures may be considered by administrations at a national level to facilitate adjacent frequency band compatibility between radio astronomy receivers in the frequency band 4 990-5 000 MHz and IMT systems in the frequency band 4 800-4 990 MHz,

*emphasizing*

*a)* that flexibility must be afforded to administrations:

- to determine, at a national level, how much spectrum to make available for IMT from within the identified frequency bands;
- to develop their own transition plans, if necessary, tailored to meet their specific deployment of existing systems;
- to have the ability for the identified frequency bands to be used by all services having allocations in those frequency bands;
- to determine the timing of availability and use of the frequency bands identified for IMT, in order to meet particular user demand and other national considerations;

*b)* that the particular needs of developing countries must be met;

*c)* that Recommendation ITU-R M.819 describes the objectives to be met by IMT-2000 in order to meet the needs of developing countries,

*noting*

*a)* Resolutions **224 (Rev.WRC-19)** and **225 (Rev.WRC-12)**, which also relate to IMT;

*b)* that the sharing implications between services sharing the frequency bands identified for IMT in No. **5.384A**, as relevant, will need further study in ITU-R;

*c)* that studies regarding the availability of the frequency band 2 300-2 400 MHz for IMT are being conducted in many countries, the results of which could have implications for the use of those frequency bands in those countries;

*d)* that, due to differing requirements, not all administrations may need all of the IMT frequency bands identified at WRC-07, or, due to the usage by and investment in existing services, may not be able to implement IMT in all of those frequency bands;

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- e) that the spectrum for IMT identified by WRC-07 may not completely satisfy the expected requirements of some administrations;
- f) that currently operating mobile communication systems may evolve to IMT in their existing frequency bands;
- g) that services such as the fixed service, the mobile service (second-generation systems), the space operation service, the space research service and the AMS are in operation or planned in the frequency band 1 710-1 885 MHz, or portions thereof;
- h) that in the frequency band 2 300-2 400 MHz, or portions thereof, there are services such as the fixed, mobile, amateur and radiolocation services which are currently in operation or planned to be in operation in the future;
- i) that services such as the broadcasting-satellite service (BSS), the BSS (sound), the MSS (in Region 3) and the fixed service (including multipoint distribution/communication systems) are in operation or planned in the frequency band 2 500-2 690 MHz, or portions thereof;
- j) that the identification of several frequency bands for IMT allows administrations to choose the best frequency band or parts thereof for their circumstances;
- k) that further study of the technical and operational measures regarding adjacent frequency band compatibility between IMT systems operating below 3 400 MHz and fixed-satellite service earth stations operating above 3 400 MHz may be required;
- l) that ITU-R has identified additional work to address further developments in IMT;
- m) that the IMT terrestrial radio interfaces as defined in Recommendations ITU-R M.1457 and ITU-R M.2012 are expected to evolve within the framework of ITU-R beyond those initially specified, to provide enhanced services and services beyond those envisaged in the initial implementation;
- n) that the identification of a frequency band for IMT does not establish priority in the Radio Regulations and does not preclude the use of the frequency band for any application of the services to which it is allocated;
- o) that the provisions of Nos. **5.317A**, **5.384A**, **5.388**, **5.429B**, **5.429D**, **5.429F**, **5.441A** and **5.441B** do not prevent administrations from having the choice to implement other technologies in the frequency bands identified for IMT, based on national requirements,

*recognizing*

that for some administrations the only way of implementing IMT would be spectrum refarming, requiring significant financial investment,

*resolves*

1 to invite administrations planning to implement IMT to make available, based on user demand and other national considerations, additional frequency bands or portions of the frequency bands above 1 GHz identified in Nos. **5.341B**, **5.384A**, **5.429B**, **5.429D**, **5.429F**, **5.441A** and **5.441B** for the terrestrial component of IMT; due consideration should be given to the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT, taking into account the services to which the frequency band is currently allocated;

2 to acknowledge that the differences in the texts of Nos. **5.341B**, **5.384A** and **5.388** do not confer differences in regulatory status;

3 that in the frequency bands 4 800-4 825 MHz and 4 835-4 950 MHz, in order to identify potentially affected administrations when applying the procedure for seeking agreement under No. **9.21** by IMT stations in relation to aircraft stations, a coordination distance from an IMT station to the border of another country equal to 300 km (for land path)/450 km (for sea path) applies;

4 that in the frequency band 4 800-4 990 MHz, in order to identify potentially affected administrations when applying the procedure for seeking agreement under No. **9.21** by IMT stations in relation to fixed-service stations or other ground-based stations of the mobile service, a coordination distance from an IMT station to the border of another country equal to 70 km applies;

5 that the power flux-density (pfd) limits in No. **5.441B**, which is subject to review at WRC-23, shall not apply to the following countries: Armenia, Brazil, Cambodia, China, Russian Federation, Kazakhstan, Lao P.D.R., Uzbekistan, South Africa, Viet Nam and Zimbabwe,

*invites the ITU Radiocommunication Sector*

1 to conduct compatibility studies in order to provide technical measures to ensure coexistence between the MSS in the frequency band 1 518-1 525 MHz and IMT in the frequency band 1 492-1 518 MHz, including guidance on the implementation of frequency arrangements for IMT deployment in the frequency band 1 427-1 518 MHz, taking into account the results of these studies;

2 to study the technical and regulatory conditions for the protection of stations of the AMS and the maritime mobile service (MMS) located in international airspace or waters (i.e. outside national territories) and operated in the frequency band 4 800-4 990 MHz;

3 to continue providing guidance to ensure that IMT can meet the telecommunication needs of developing countries and rural areas;

4 to include the results of the studies mentioned in *invites the ITU Radiocommunication Sector* above in one or more ITU-R Recommendations and Reports, as appropriate,

*invites the 2023 World Radiocommunication Conference*

to consider, based on the results of the studies referred to in *invites the ITU Radiocommunication Sector* above, possible measures to address, in the frequency band 4 800-4 990 MHz, protection of stations of the AMS and MMS located in international airspace and waters from other stations located within national territories and to review the pfd criteria in No. **5.441B**.

