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| **World Radiocommunication Conference (WRC-19)Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Addendum 13 toDocument 28-E** |
|  | **30 September 2019** |
|  | **Original: Chinese** |
|  |
| China (People's Republic of) |
| Proposals for the work of the Conference |
|  |
| Agenda item 1.13 |

1.13 to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution **238 (WRC-15)**;

Proposal

China supports to identify the 24.75-27.5 GHz frequency band for IMT on a global basis through Method A2 of the CPM Report together with a new WRC Resolution.

China supports Option 1 under Method A2.

In addition, China supports the following Options under the respective Conditions for Method A2 contained in the CPM Report.

Supported Options under the respective Conditions for Method A2

| Conditions | Supported Options  |
| --- | --- |
| A2a | Protection measures for the EESS (passive) in the 23.6-24 GHz frequency band | Option 1 withs−37 to −44 dBW/200MHz for IMT base stations and−33 to −40 dBW/200MHz for IMT mobile stationsin 24.25-27.5 GHz |
| A2b | Protection measures for the EESS (passive) in the 50.2-50.4 GHz and 52.6-54.25 GHz frequency bands | Option 2 |
| A2c | Protection measures for earth stations in the SRS/EESS (25.5-27 GHz (space-to-Earth)) | Option 2 |
| A2d | Measures related to transmitting earth stations in the FSS (Earth-to-space) at known locations | Option 2 |
| A2e | Protection measures for the ISS and FSS (Earth-to-space) receiving space stations | Option 1 with TRP 33-36 dBm/200MHz |
| A2f | Protection measures for the RAS (23.6-24 GHz) | Option 2 |
| A2g | Protection measures for multiple services | Option 4 or Option 3 |

China supports no change to the Radio Regulations (RR) in the frequency band 31.8-33.4 GHz.

China supports no change to the RR in the frequency band 37-40.5 GHz.

China supports the upgrade of the existing secondary allocation to the mobile service in the frequency band 40.5-42.5 GHz to a primary allocation in the Table of Frequency Allocations and identifying the 40.5-43.5 GHz frequency band for IMT globally through Methods D2 and E2 together with a new WRC Resolution.

In addition, China supports the following Options under the respective Conditions for Methods D2 and E2 contained in the CPM Report.

Supported Options under the respective Conditions for Methods D2 and E2

| Conditions | Supported Option |
| --- | --- |
| D2a | Protection measures for the FSS/BSS (space-to-Earth) | 1 |
| D2b | Protection measures for the RAS | 2 |
| D2c | Protection measures for multiple services | 3  |
| E2a | Protection measures for the FSS (Earth-to-space) | 5 with possible TRP limit |
| E2b | Protection measures for the RAS | 2 |
| E2c | Protection measures for multiple services | 3 |
| E2d | Measures related to transmitting earth stations in the FSS (Earth-to-space) at known locations | 1 |

China supports no change to the RR in the frequency bands 45.5-47, 47-47.2 and 47.2-52.6 GHz.

China supports to identify the frequency band 66-71 GHz for IMT through Method J4 under the Condition J4a of Option 4 “No condition is necessary”.

China supports no change to the RR in the frequency bands 71-76 GHz and 81-86 GHz in WRC-19 and requests for further consideration and studies on the possibility of identifying those bands for IMT at WRC-23.

ARTICLE 5

Frequency allocations

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

MOD CHN/28A13/1#49834

24.75-29.9 GHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 24.75-25.25FIXEDFIXED-SATELLITE(Earth-to-space) 5.532BMOBILE except aeronautical mobileADD 5.A113 MOD 5.338A | 24.75-25.25FIXED-SATELLITE(Earth-to-space) 5.535MOBILE except aeronautical mobileADD 5.A113 MOD 5.338A | 24.75-25.25FIXEDFIXED-SATELLITE(Earth-to-space) 5.535MOBILEADD 5.A113 MOD 5.338A |
| 25.25-25.5 FIXED INTER-SATELLITE 5.536 MOBILEADD 5.A113 MOD 5.338A Standard frequency and time signal-satellite (Earth-to-space) |
| 25.5-27EARTH EXPLORATION-SATELLITE (space-to Earth) MOD 5.536B FIXED INTER-SATELLITE 5.536 MOBILEADD 5.A113 MOD 5.338A SPACE RESEARCH (space-to-Earth) MOD 5.536C Standard frequency and time signal-satellite (Earth-to-space) MOD 5.536A |
| 27-27.5FIXEDINTER-SATELLITE 5.536MOBILE ADD 5.A113 MOD 5.338A | 27-27.5 FIXED FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE ADD 5.A113 MOD 5.338A |

**Reasons:** China supports IMT identification in the frequency band 24.75-27.5 GHz for worldwide harmonisation under certain conditions.

ADD CHN/28A13/2#49835

5.A113The frequency band 24.25-27.5 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. The use of this frequency band by the mobile service for IMT is limited to the land mobile service. [Resolution **[CHN/A113-IMT 26 GHZ] (WRC‑19)** applies.]    (WRC‑19)

**Reasons:** It is proposed to limit the identification of IMT by the LMS due to the fact that ITU-R did not undertake sharing and compatibility studies for aeronautical and maritime deployments of IMT. Based on the ITU-R studies, sharing conditions developed in the CPM Report for IMT applications in the LMS may not be applicable for IMT applications in the AMS and MMS, therefore the protection of incumbent services will not be ensured.

MOD CHN/28A13/3#49841

5.338AIn the frequency bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 24.25-27.5 GHz, 30-31.3 GHz, 49.7‑50.2 GHz, 50.4-50.9 GHz, 51.4-52.6 GHz, 81-86 GHz and 92-94 GHz, Resolution **750 (Rev.WRC‑19)** applies.     (WRC‑19)

**Reasons:** The identification of the frequency band 24.25-27.5 GHz for IMT will require limits in the Resolution **750 (Rev.WRC-19)** to ensure protecting the EESS (passive) in the frequency band 23.6-24.0 GHz.

MOD CHN/28A13/4#49842

5.536A Administrations operating earth stations in the Earth exploration-satellite service or the space research service shall not claim protection from stations (except IMT stations) in the fixed and mobile services operated by other administrations. In addition, earth stations in the Earth exploration-satellite service or in the space research service should be operated taking into account the most recent version of Recommendation ITU‑R SA.1862.     (WRC‑19)

**Reasons:** The reference to future SRS/EESS earth station responds to Resolution **238 (WRC-15)**, which emphasizes the need “to take into account the need to ensure the protection of existing earth stations and the deployment of future receiving earth stations under the EESS (space-to-Earth) and SRS (space-to-Earth) allocation in the frequency band 25.5-27 GHz”. The IMT in this band is a new application while EESS/SRS earth stations are the existing applications with primary allocations. Therefore, there is no reason to come to a conclusion that EESS/SRS earth stations could not claim protection from IMT.

MOD CHN/28A13/5#49843

5.536B In Saudi Arabia, Austria, Bahrain, Belgium, Brazil, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Estonia, Finland, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, the Syrian Arab Republic, Dem. People’s Rep. of Korea, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the frequency band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations (except IMT stations) of the fixed and mobile services.     (WRC‑19)

**Reasons:** The reference to future SRS/EESS earth station responds to Resolution **238 (WRC-15)**, which emphasizes the need “to take into account the need to ensure the protection of existing earth stations and the deployment of future receiving earth stations under the EESS (space-to-Earth) and SRS (space-to-Earth) allocation in the frequency band 25.5-27 GHz”. The IMT in this band is a new application while EESS/SRS earth stations are the existing applications with primary allocations. Therefore , there is no reason to come to a conclusion that EESS/SRS earth stations could not claim protection from IMT.

MOD CHN/28A13/6#49844

5.536C In Algeria, Saudi Arabia, Bahrain, Botswana, Brazil, Cameroon, Comoros, Cuba, Djibouti, Egypt, United Arab Emirates, Estonia, Finland, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Lithuania, Malaysia, Morocco, Nigeria, Oman, Qatar, Syrian Arab Republic, Somalia, Sudan, South Sudan, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations (except IMT stations) of the fixed and mobile services.     (WRC‑19)

**Reasons:** The reference to future SRS/EESS earth station responds to Resolution **238 (WRC-15)**, which emphasizes the need “to take into account the need to ensure the protection of existing earth stations and the deployment of future receiving earth stations under the EESS (space-to-Earth) and SRS (space-to-Earth) allocation in the frequency band 25.5-27 GHz”. The IMT in this band is a new application while EESS/SRS earth stations are the existing applications with primary allocations. Therefore, there is no reason to come to a conclusion that EESS/SRS earth stations could not claim protection from IMT.

MOD CHN/28A13/7#49932

RESOLUTION 750 (Rev.WRC‑19)

Compatibility between the Earth exploration-satellite service (passive) and relevant active services

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

…

resolves

1 that unwanted emissions of stations brought into use in the frequency bands and services listed in Table 1‑1 below shall not exceed the corresponding limits in that table, subject to the specified conditions;

…

TABLE 1-1

|  |  |  |  |
| --- | --- | --- | --- |
| EESS (passive) band | Activeservice band | Active service | Limits of unwanted emission power fromactive service stations in a specified bandwidthwithin the EESS (passive) band1 |
| … | … | … | … |
| 23.6-24.0 GHz | 24.25-27.5 GHz | Mobile (IMT) | −37 to −44 dBW in the 200 MHz of the EESS (passive) band for IMT base stations5−33 to −40 dBW in the 200 MHz of the EESS (passive) band for IMT mobile stations5 |
| … | … | … | … |
| 1 The unwanted emission power level is to be understood here as the level measured at the antenna port, unless specified in terms of total radiated power.…5 The unwanted emission power level is measured by total radiated power (TRP). The TRP is to be understood here as the integral of the power transmitted in different directions over the entire radiation sphere. |

**Reasons:** The identification of the frequency band 24.25-27.5 GHz for IMT will require limits in Resolution **750** (**Rev.WRC-19**) to ensure compatibility with the EESS (passive) in the frequency band 23.6-24.0 GHz. The limits range comes from current Task Group (TG) 5/1 studies according to different assumptions.

ADD CHN/28A13/8#49920

DRAFT NEW RESOLUTION [CHN/A113-IMT 26 GHZ] (WRC-19)

International Mobile Telecommunications
in frequency band 24.25-27.5 GHz

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, including IMT‑2000, IMT-Advanced and IMT‑2020, regardless of location and type of network or terminal;

*c)* that the evolution of IMT is being studied within ITU‑R;

*d)* that harmonized worldwide bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;

*e)* that IMT systems are now being evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications;

*f)* that ultra-low latency and very high bit-rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that are currently identified for use by administrations wishing to implement IMT;

*g)* that the properties of higher frequency bands, such as shorter wavelength, would better enable the use of advanced antenna systems including MIMO and beam-forming techniques in supporting enhanced broadband;

*h)* that the frequency band 24.25-27.5 GHz and its adjacent band are also allocated to terrestrial and space services used by a variety of different systems and these existing services and their future development need to be protected from the operation of IMT;

*i)* that the adjacent band 23.6-24 GHz and the second harmonic bands 50.2-50.4 GHz and 52.6-54.25 GHz of the frequency band 24.25-27.5 GHz are allocated to the Earth exploration-satellite service (EESS) (passive) on a primary basis and are used by many passive sensors to observe the Earth and its atmosphere including atmosphere temperature, sea surface temperature, wind speed, water vapour, cloud water, rain and so on, these products are used extensively in meteorology, climatology and other scientific purposes;

*j)* that although EESS (passive) satellites are currently operated by only a limited number of countries, measurements are performed worldwide and the remote sensing data and related analyses are distributed and used globally, and are performed for the benefit of the whole international community;

*k)*  that the EESS (passive) systems are crucial for the protection of human life and natural resources, therefore it is necessary to ensure that the EESS (passive) systems shall be protected without any undue constraints or impact to their operations in the frequency bands 23.6-24 GHz, 50.2-50.4 GHz and 52.6-54.25 GHz;

*l)* that ITU‑R has studied, in preparation for WRC‑19, sharing and compatibility with services allocated in the frequency band 24.25-27.5 GHz and its adjacent band, based on characteristics available at that time;

*m)* that identification of frequency bands allocated to the mobile service on a co-primary basis for IMT may change the sharing situation regarding applications of services to which the frequency band is already allocated, and may require additional regulatory actions;

*n)* that the results of ITU‑R compatibility studies of IMT‑2020 systems are probabilistic, and therefore the deployment parameters of IMT‑2020 systems that affect compatibility with satellite receivers may vary during practical implementation and deployment of IMT‑2020 networks;

*o)* that the identification of frequency bands for IMT‑2020 requires technical, operational and regulatory measures to ensure compatibility with the incumbent services having an allocation in identified frequency bands,

noting

Recommendation ITU‑R M.2083 “IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond”,

recognizing

*a)* that Resolution **750 (Rev.WRC‑19)** establishes limits on unwanted emissions in the frequency band 23.6-24 GHz from IMT base stations and IMT mobile stations within the 24.25-27.5 GHz frequency band;

*b)* that ITU-R demonstrated the feasibility of sharing between IMT and ISS/FSS (Earth-to-space) in the frequency band 24.25-27.5 GHz based on a set of baseline assumptions including the IMT base stations deployment mean density of 1 200 per 10 000 km2 in a relatively large area;

*c)* that spurious emission limits of Recommendation ITU‑R SM.329 Category B (−60 dB(W/MHz)) are sufficient to protect the EESS (passive ) within the bands 50.2-50.4 GHz and 52.6-54.25 GHz from the second harmonic of IMT base station emissions in the 24.25-27.5 GHz band,

resolves

1 in order to ensure the coexistence between IMT in the frequency band 24.25-27.5 GHz as identified by WRC‑19 in Article **5** of the Radio Regulations and other services to which the frequency band is allocated including the protection of these other services, administrations shall apply the conditions of this resolution;

2 that administrations wishing to implement IMT consider the use of frequency band 24.25-27.5 GHz identified for IMT in No. **5.A113**, and the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT taking into account the latest relevant ITU‑R Recommendations;

3the operation of IMT within the frequency band 24.25-27.5 GHz shall protect the existing and future SRS/EESS earth stations;

4the operation of IMT within the frequency band 24.25-27.5 GHz shall not impose any undue constraints of existing and future FSS earth stations;

5 the operation of IMT within the frequency band 24.25-27.5 GHz shall protect the existing and future EESS (passive) systems in the frequency bands 23.6-24 GHz, 50.2-50.4 GHz and 52.6-54.25 GHz;

6 that, when deploying outdoor IMT base stations, all potential measures shall be taken to keep the elevation angle of the antenna main beam of IMT base stations not higher than 0 degrees relative to the horizontal and the mechanical tilt of IMT base stations be below −10 degrees relative to the horizon;

7 that the antenna pattern of IMT base stations should be kept within the limits of approximation envelope according to Recommendation ITU‑R M.2101;

8 that the IMT base stations shall comply with the TRP limits given in Table 1:

Table 1

TRP\* limits for IMT base stations

|  |  |
| --- | --- |
| Frequency bands | dB(W/200 MHz) |
| 24.25-27.5 GHz | 3-6 |
| \* Total radiated power (TRP) is to be understood here as the integral of the power transmitted in different directions over the entire radiation sphere. |

9the operation of IMT within the frequency band 24.25-27.5 GHz shall protect the existing and future RAS stations in the frequency band 23.6-24 GHz;

10 IMT systems in the mobile service in the frequency band 24.25-27.5 GHz shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated,

invites administrations

1to adopt provisions to protect other services from IMT networks and to ensure the possibility of deploying future SRS/EESS earth stations;

2 to adopt provisions to limit the maximum density of 1 200 BSs per 10 000 km² for outdoor hot spots within its territory. In case when area of an administration is lesser than 10 000 km² the number of IMT BS should be reduced proportionally;

3 to collaborate, to the maximum extent practicable, for the implementation of this Resolution, in particular for resolving interference, if any,

invites ITU‑R

1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency band 24.25-27.5 GHz, taking into account the assumptions and results of sharing and compatibility studies;

2to develop an ITU‑R Recommendation to assist administrations in protecting existing and future SRS/EESS earth stations operating in the frequency band 25.5-27 GHz;

3to develop an ITU‑R Recommendation to assist administrations in ensuring the coexistence between existing and future FSS earth stations and IMT operating within the frequency band 24.25-27.5 GHz provided that this Recommendation is incorporated by reference into the Radio Regulations;

4 to regularly review the impact of the evolution of IMT technical and deployment characteristics (including BS density taking into account the baseline assumptions referred to in *recognizing b)* above) on sharing and compatibility with other services (e.g. space services) and, as necessary, to take into account the results of these reviews in the development or revision of ITU‑R Recommendations/Reports;

5to regularly update characteristics of IMT deployments (including BS density) and to study/assess the impact on sharing and compatibility with other services resulting from these deployments with reporting through BR Director on the results to WRC,

instructs the Director of the Radiocommunication Bureau

1 to take any necessary actions for the implementation of this Resolution;

2 to take any necessary actions to facilitate the implementation of this Resolution, including assisting in resolving interference, if any;

3 to report to future WRCs any difficulties or inconsistencies encountered in the implementation of this Resolution;

4 to report to a future competent conference on the results of studies in *invites ITU-R*5 above.

**Reasons:** China supports an IMT identification in the band 24.75-27.5GHz for worldwide harmonization under certain conditions.

ARTICLE 5

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

NOC CHN/28A13/9#49935

29.9-34.2 GHz

**Reasons:** Method B1 is the only Method in the CPM text for the frequency band 31.8-33.4 GHz, because of the difficulty of sharing and compatibility between IMT and the incumbent services.

NOC CHN/28A13/10#49936

34.2-40 GHz

**Reasons:** The balance between spectrum available for IMT and spectrum available for satellite earth stations (e.g. HDFSS) has been taken into consideration. Furthermore, in order to protect EESS (passive) in the adjacent 36-37 GHz band, a strict out-of-band emission limits (e.g. −46 dBW/100 MHz) need to be set for IMT stations, which may result in the inability of IMT stations to work.

MOD CHN/28A13/11

40-47.5 GHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 40.5-41FIXEDFIXED-SATELLITE (space-to-Earth)MOBILE ADD 5.B113BROADCASTINGBROADCASTING-SATELLITE5.547 | 40.5-41FIXEDFIXED-SATELLITE (space-to-Earth) 5.516BMOBILE ADD 5.B113BROADCASTINGBROADCASTING-SATELLITEMobile-satellite (space-to-Earth)5.547 | 40.5-41FIXEDFIXED-SATELLITE (space-to-Earth)MOBILE ADD 5.B113BROADCASTINGBROADCASTING-SATELLITE5.547 |
| 41-42.5 FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE ADD 5.B113 BROADCASTING BROADCASTING-SATELLITE 5.547 5.551F 5.551H 5.551I |
| 42.5-43.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile ADD 5.B113 RADIO ASTRONOMY 5.149 5.547 |
| 43.5-47 MOBILE 5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554 |
| 47-47.2 AMATEUR AMATEUR-SATELLITE |

**Reasons:** China supports identifying the frequency band 40.5-43.5 GHz for the terrestrial component of IMT globally with a new WRC Resolution.

So far, compatibility studies were only performed between MSS and IMT-2020 systems in the 45.5-47 GHz band. The other incumbent services in 45.5-47 GHz have not been studied. Therefore, it has not been demonstrated that the incumbent services can be protected according to Resolution **238 (WRC-15)**. We propose no change (NOC) to RR with regard to 45.5-47 GHz frequency band.

Studies have not been performed between IMT-2020 systems and incumbent services in the 47-47.2 GHz band. Therefore, it has not been demonstrated that the incumbent services can be protected according to Resolution **238 (WRC-15)**. We propose no change (NOC) to RR with regard to 47-47.2 GHz frequency band.

ADD CHN/28A13/12#49852

5.B113The frequency band 40.5-43.5 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 **[CHN/B113-IMT 40 GHZ] (WRC‑19)** applies.]     (WRC‑19)

**Reasons:** China supports identifying the frequency band 40.5-43.5 GHz for the terrestrial component of IMT globally with a new WRC Resolution. The choice between Option 1 or 2 is yet to be made.

ADD CHN/28A13/13#49927

DRAFT NEW RESOLUTION [CHN/B113-IMT 40 GHZ] (WRC‑19)

International Mobile Telecommunications in frequency bands
40.5-43.5 GHz

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

considering

*a)* that International Mobile Telecommunications (IMT), including IMT-2000, IMT‑Advanced and IMT-2020, is intended to provide telecommunication services on a worldwide scale, regardless of location and type of network or terminal;

*b)* that the evolution of IMT is being studied within ITU‑R;

*c)* that adequate and timely availability of spectrum and supporting regulatory provisions is essential to realize the objectives in Recommendation ITU‑R M.2083;

*d)* that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;

*e)* that IMT systems are now being evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications;

*f)* that ultra-low latency and very high bit-rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that are currently identified for use by administrations wishing to implement IMT;

*g)* that the properties of higher frequency bands, such as shorter wavelength, would better enable the use of advanced antenna systems including MIMO and beam-forming techniques in supporting enhanced broadband;

*h)* that harmonized worldwide bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;

*i)* the need to protect existing services and to allow for their continued development when considering frequency bands for possible additional allocations to any service;

*j)* that the pointing elevation of the main beam (electrical and mechanical) should normally be below the horizon for outdoor base stations;

*k)* that the coverage of outdoor hotspot has been assumed in sharing studies to be achieved with the deployment of base stations communicating with terminals on the ground and a very limited number of indoor terminals with positive elevation, resulting in an elevation of the main beam of outdoor base stations normally below the horizon, thus with high discrimination towards the satellites,

noting

Recommendation ITU‑R M.2083 “IMT Vision –Framework and overall objectives of the future development of IMT for 2020 and beyond”,

recognizing

*a)* 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 by any application of the services to which it is allocated;

*b)* that for the purpose of protecting the radio astronomy service in the frequency band 42.5-43.5 GHz, No. **5.149** applies,

resolves

1 that administrations wishing to implement IMT consider the use of frequency band 40.5-43.5 GHz identified for IMT in No. **5.B113** and the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT taking into account the latest relevant ITU‑R Recommendation;

2 in order to ensure the coexistence between IMT in the frequency band 42.5-43.5 GHz as identified by WRC‑19 in Article **5** of the Radio Regulations and other services to which the frequency band is allocated including the protection of these other services, administrations shall apply the conditions of this resolution;

3 that, when deploying outdoor IMT base stations in the frequency bands 42.5-43.5 GHz, it shall be ensured that each antenna normally transmits only with the main beam pointing below the horizon and the antenna shall have mechanical pointing below the horizon except when the base station is only receiving;

4the operation of IMT within the frequency bands 40.5-42.5 GHz and 42.5-43.5 GHz shall protect the existing and future RAS stations in the frequency band 42.5-43.5 GHz,

invites administrations

1 to ensure that, when considering, nationally or regionally, the spectrum to be used for IMT, due attention is paid to the need for spectrum for earth stations that could be deployed in a ubiquitous manner (i.e. small user earth stations) and for earth stations that could be coordinated (i.e. gateways) in both downlink (37.5-42.5 GHz) and uplink (42.5-43.5 GHz) directions, taking into account spectrum identified for the HDFSS as per No. **5.516B**,

invites ITU‑R

1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency bands 40.5-43.5 GHz taking into account the results of sharing and compatibility studies;

2 to continue providing guidance to ensure that IMT can meet the telecommunication needs of the developing countries and rural areas in the context of the studies referred to above;

3 to develop an ITU‑R Recommendation to assist administrations in ensuring the protection of existing and future FSS/BSS earth stations in the frequency bands 40.5-42.5 GHz, from IMT deployments in neighbouring countries;

4 to update existing ITU‑R Recommendations or develop new ITU‑R Recommendations, as appropriate, to provide information on possible coordination and protection measures for the RAS stations in the frequency band 42.5-43.5 GHz;

5 to regularly review the impact of the evolution of IMT technical and operational characteristics (including BS density) on sharing and compatibility with other services (e.g. space services) and, as necessary, to take into account the results of these reviews in the development or revision of ITU‑R Recommendations/Reports, e.g. on IMT characteristics.

ARTICLE 5

Frequency allocations

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

NOC CHN/28A13/14#49944

47.5-51.4 GHz

**Reasons:** No change would avoid any potential impact on the existing services.

NOC CHN/28A13/15#49945

51.4-55.78 GHz

**Reasons:** No change would avoid any potential impact on the existing services.

MOD CHN/28A13/16#49901

66-81 GHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 66-71 INTER-SATELLITE MOBILE MOD 5.553 5.558 ADD 5.J113 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE 5.554 |

ADD CHN/28A13/17#49902

5.J113The frequency band 66-71 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.     (WRC‑19)

**Reasons:** The identification of the band 66-71 GHz for IMT will help satisfy the need for additional spectrum in the bands above 24 GHz.

NOC CHN/28A13/18#49948

81-86 GHz

**Reasons:** We propose no change to the Radio Regulations at WRC-19 and request to further consider and study on the possibility of identification for IMT in the frequency bands 71-76 GHz and 81-86 GHz so as to review the issue at WRC-23.

MOD CHN/28A13/19

RESOLUTION 238 (WRC‑19)

Studies on frequency-related matters for International Mobile Telecommunications identification in the frequency bands 71-76 GHz and 81-86 GHz for the future
development of International Mobile Telecommunications
for 2020 and beyond

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

considering

*a)* that International Mobile Telecommunications (IMT) is intended to provide telecommunication services on a worldwide scale, regardless of location and type of network or terminal;

*b)* that IMT systems have contributed to global economic and social development;

*c)* that IMT systems are now being evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications;

*d)* that ultra-low latency and very high bit rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that are currently identified for use by administrations wishing to implement IMT;

*e)* that it may be suitable to examine higher frequency bands for these larger blocks of spectrum;

*f)* that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;

*g)* that the properties of higher frequency bands, such as shorter wavelength, would better enable the use of advanced antenna systems including MIMO and beam-forming techniques in supporting enhanced broadband;

*h)* that ITU‑T has initiated the study of network standardization for IMT for 2020 and beyond;

*i)* that adequate and timely availability of spectrum and supporting regulatory provisions is essential to realize the objectives in Recommendation ITU‑R M.2083;

*j)* that harmonized worldwide bands and harmonized frequency arrangements for IMT are highly desirable in order to achieve global roaming and the benefits of economies of scale;

*k)* that identification of frequency bands allocated to mobile service for IMT may change the sharing situation regarding applications of services to which the frequency band is already allocated, and may require additional regulatory actions;

*l)* the need to protect existing services and to allow for their continued development when considering frequency bands for possible additional allocations to any service,

noting

*a)* that Resolution ITU‑R 65 addresses the principles for the process of development of IMT for 2020 and beyond, and that Question ITU‑R 77‑7/5 considers the needs of developing countries in the development and implementation of IMT;

*b)* that Question ITU‑R 229/5 seeks to address the further development of IMT;

*c)* that IMT encompasses both IMT-2000, IMT-Advanced, and IMT-2020 collectively, as described in Resolution ITU‑R 56‑2;

*d)* Recommendation ITU‑R M.2083, on the framework and objectives of the future development of IMT for 2020 and beyond;

*e)* that Report ITU‑R M.2320 addresses future technology trends of terrestrial IMT systems;

*f)* Report ITU‑R M.2376, on technical feasibility of IMT in the frequency bands above 6 GHz;

*g)* that Report ITU‑R M.2370 analyses trends impacting future IMT traffic growth beyond the year 2020 and estimates global traffic demands for the period 2020 to 2030;

*h)* that there are ongoing studies within ITU‑R on the propagation characteristics for mobile systems in higher frequency bands;

*i)* the relevance of provisions in Nos. **5.340**, **5.516B**, **5.547** and **5.553**, which may need to be taken into account in studies,

recognizing

*a)* that there is a lead time between the allocation of frequency bands by world radiocommunication conferences and the deployment of systems in those bands, and that timely availability of wide and contiguous blocks of spectrum is therefore important to support the development of IMT;

*b)* that frequency bands allocated to passive services on an exclusive basis are not suitable for an allocation to the mobile service;

*c)* that any identification of frequency bands for IMT should take into account the use of the bands by other services and the evolving needs of these services;

*d)* that there should be no additional regulatory or technical constraints imposed to services to which the band is currently allocated on a primary basis,

resolves to invite ITU‑R

1 to conduct and complete in time for WRC‑23 the appropriate studies to determine the spectrum needs for the terrestrial component of IMT in the frequency range between 71-76 GHz and 81-86 GHz, taking into account:

– technical and operational characteristics of terrestrial IMT systems that would operate in this frequency range, including the evolution of IMT through advances in technology and spectrally efficient techniques;

– the deployment scenarios envisaged for IMT-2020 systems and the related requirements of high data traffic such as in dense urban areas and/or in peak times;

– the needs of developing countries;

– the time-frame in which spectrum would be needed;

2 to conduct and complete in time for WRC‑ 23 the appropriate sharing and compatibility studies, taking into account the protection of services to which the band is allocated on a primary basis including services in adjacent bands, for the frequency bands:

– 71-76 GHz and 81-86 GHz, which have allocations to the mobile service on a primary basis,

further resolves

1 to invite CPM23‑1 to define the date by which technical and operational characteristics needed for sharing and compatibility studies are to be available, to ensure that studies referred to in *resolves to invite ITU‑R* can be completed in time for consideration at WRC‑23;

2 to invite WRC‑23, based on the results of the above studies, to consider identification of frequency bands for the terrestrial component of IMT; the bands to be considered being limited to part or all of the bands listed in *resolves to invite ITU‑R* 2,

invites administrations

to participate actively in these studies by submitting contributions to ITU‑R.

**Reasons:** The frequency band of 71-76 GHz and 81-86 GHz is important for 5G NR to enable high data rate and low latency communications and applications with the large continuous bandwidth. It is essential that these frequency bands to be identified for IMT use as they expect to provide the highest data rates and the largest capacity. This would help to generate momentum and global economies of scale for IMT, including new emerging applications such as those in the vertical industries. The results of sharing studies (2/1.13/3.2.10 and 2/1.13/3.2.11 of the CPM text to WRC‑19) show that sharing with in- band services and adjacent RAS service is feasible, while additional limits of the IMT BS and UE unwanted emissions levels are needed to ensure protection of RLS in the adjacent frequency band 76-81 GHz and EESS (passive) in the adjacent frequency band 86-92 GHz. Given that only two sharing studies have been carried out for IMT VS RLS (automotive radar) and the results of the studies vary significantly, it is difficult for WRC-19 to make a decision. Therefore, it’s proposed to consider and continue the studies on the possibility of the identification for IMT in the frequency bands 71-76 GHz and 81-86 GHz at WRC-23. Relevant draft of a WRC resolution is given in this proposal.

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