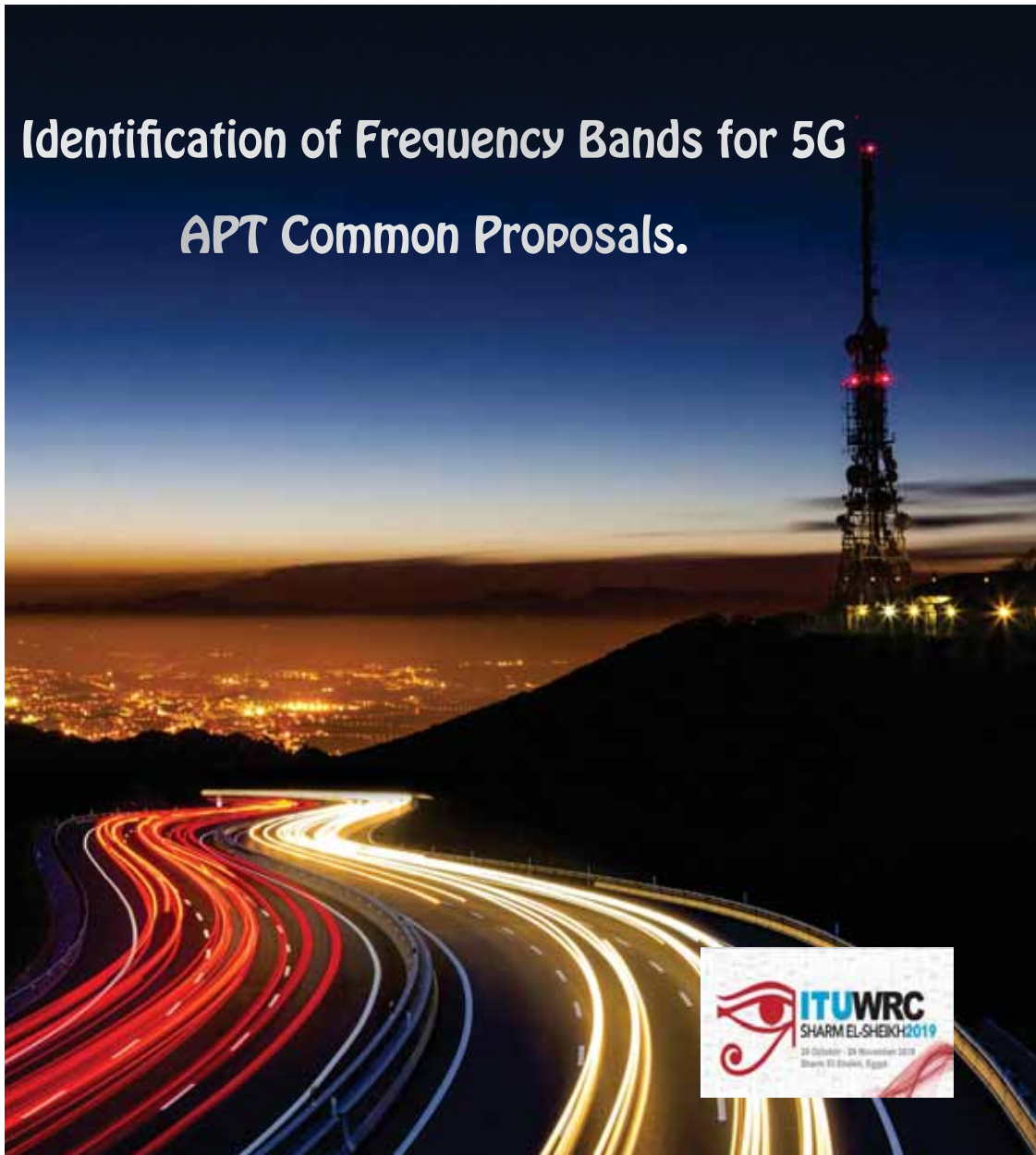


5G at WRC-19



Identification of Frequency Bands for 5G APT Common Proposals.



Enabling terrestrial wireless communications

Wireless communications have helped connect billions of people to the Internet so that they can reap the benefits of today's digital economy.

Nearly every sector of the economy now relies upon wireless technologies – from banking and agriculture to transportation and health care. And powerful new technologies that rely on robust wireless communications networks – such as 5G, Artificial Intelligence and Internet of Things – hold great promise to improve lives at an unprecedented pace and scale.

Indeed, they have potential to accelerate progress towards achieving each of the 17 United Nations Sustainable Development Goals (SDGs).

ITU's Radiocommunication Sector (ITU-R) globally regulates the use of radio-frequency spectrum and satellite orbits to ensure these critical resources are used rationally, efficiently, economically, and equitably, and to prevent harmful interference between services of different government administrations.

In October, ITU's World Radiocommunication Conference 2019 (WRC-19) will update the very important [Radio Regulations](#) international treaty, enabling those industries that are using current and future terrestrial radiocommunication technologies to continue to bring benefits to everyone.



“Nearly every sector of the economy now relies upon wireless technologies — from banking and agriculture to transportation and health care.”

Houlin Zhao

Identification of Frequency bands above 24 Ghz for 5G at World Radio Communications Conference 2019

World Radiocommunication Conferences (WRC) are organized by the ITU every three to four years to review and revise the Radio Regulations, the international legal treaty governing the global use of the frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits.

World Radiocommunication Conference 2019 (WRC-19) will take place in Sharm El Sheikh, Egypt, from 28 October to 22 November 2019. The Government of Egypt, which will host the conference, has confirmed that the Conference will be held at the Sharm El Sheikh International Congress Center (SHICC). A Radiocommunication Assembly (RA-19) will also be held at the same location immediately preceding the WRC-19 from 21 to 25 October 2019. Over 4000 delegates including Ministers, Ambassadors, Chairmen, Members, senior regulators and senior wireless industry executives (CEO/CTO) are expected to take part in this Mecca for wireless Industry.

The success of any WRC depends on the critical inputs submitted by the six regional groups namely the APT, CEPT, CITELE, RCC, ASMG and the ATU as the coordinated Regional Common proposals. The 5th Meeting of the APT Conference Preparatory Group for WRC-19 (APG19-5) was held from 31 July to 6 August 2019 in Tokyo, Japan. At this meeting, common proposals on behalf of 38 administrations of Asia and Pacific region were finalized for most of the key WRC-19 Agenda Items. This meeting was attended by 529 delegates including 425 delegates representing 26 Asia Pacific countries' administrations. It is time now for these administrations to decide and vote on the Preliminary Asia Pacific Common Proposals (PACPs) so that these become Asia Pacific Common Proposals (ACPs) and get submitted to WRC-19.

In line with other APT member countries, Department of Telecom (WPC Wing) will also need to decide on which of these PACPs to support. This booklet contains the PACPs for the 5G agenda of the WRC-19, known as agenda item 1.13

**APT VIEWS AND PRELIMINARY APT COMM ON PROPOSAL
ON WRC-19 AGENDA ITEM 1.13**

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Agenda Item 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);

1. Background

IMT-2020 supports several new applications. Resolution 238 (WRC-15) calls for studies to determine the spectrum needs for the terrestrial component of IMT in the frequency range between 24.25 GHz and 86 GHz, as well as sharing and compatibility studies, taking into account the protection of services to which the band is allocated on a primary basis, for the frequency bands:

- 24.25-27.5 GHz¹, 37-40.5 GHz, 42.5-43.5 GHz, 45.5-47 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz, which have allocations to the mobile service on a primary basis; and
- 31.8-33.4 GHz, 40.5-42.5 GHz and 47-47.2 GHz, which may require additional allocations to the mobile service on a primary basis.

The CPM Report for agenda item 1.13 considered the following:

- a description of the estimated spectrum needs for the terrestrial component of IMT in the frequency range between 24.25 GHz and 86 GHz;
- the sharing and compatibility studies carried out by ITU-R for each frequency band under study;
- the methods to satisfy agenda item 1.13;
- regulatory and procedural considerations for each frequency band under study.

Summary of issues and Views during APG 19-5

Frequency Band: 24.25-27.5 GHz

APG19-5 received a number of proposals which support Method A2 for the frequency band 24.25-27.5 GHz together with different combinations of Alternative and Options under the various Conditions in the CPM Report.

Regarding Alternative 1 and 2 under Method A2, while some APT Members support Alternative 2, some other APT Members support Alternative 1 based on the view that ITU-R sharing and compatibility studies in this frequency band did not fully address the operation of IMT-2020 stations within the maritime and aeronautical mobile service.

Regarding Condition A2a, APT Members agreed to support Option 1. However, the values to be specified in the active service band and limits of unwanted emission power from IMT base and mobile stations within the EESS (passive) band need to be further investigated. During the APG19-5 meeting, the following options were summarized for further investigation.

¹ When conducting studies in the band 24.5-27.5 GHz, 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.

Frequency band for the active service band being considered by APT Members

Option	Frequency band for the active service band
1	24.25-24.75 GHz
2	24.25-25.25 GHz
3	24.25-26.5 GHz
4	24.25-27.5 GHz

Limits of unwanted emission power from IMT base and mobile stations within the EESS (passive) band being considered by APT Members

Option	Limits of unwanted emission power from IMT base and mobile stations
1	<ul style="list-style-type: none"> To choose a single value for the unwanted emission limit of IMT base stations from the range -28 to -37 dB(W/200 MHz); and To choose a single value for the unwanted emission limit of IMT mobile stations from the range -24 to -33 dB(W/200 MHz)
2	<ul style="list-style-type: none"> To choose a single value for the unwanted emission limit of IMT base stations from the range -35 to -42 dB(W/200 MHz); and To choose a single value for the unwanted emission limit of IMT mobile stations from the range -31 to -38 dB(W/200 MHz)

Regarding Condition A2b, APG19-5 received proposals by some APT Members which support either Option 2 or 3. After the discussion, APT Members agreed to support Option 2.

Regarding Conditions A2c, A2d, A2e, A2f and A2g, APT Members decided not to create corresponding elements for PACPs to be included in a new WRC Resolution in this frequency band due to a number of various proposals. Therefore, APT Members need to further investigate Options to be taken for the respective Conditions towards WRC-19.

Based on the discussion above, APT Views and PACPs were developed as shown in Sections 4 and 5 below, respectively.

APT View(s)

- **24.25-27.5 GHz**

APT Members support identifying the 24.25-27.5 GHz frequency band for IMT globally through Method A2 together with a new WRC Resolution.

In principle, APT Members support Alternative 2 under Method A2. However, it may be subject to the regulatory provisions to be specified in the new WRC Resolution associated with Condition A2e.

In addition, APT Members have the following views on Options under the respective Conditions for Method A2 contained in the CPM Report. It should be noted that APT Members are still investigating the Options to be selected for some of the Conditions.

APT Views on Options under the respective Conditions for Method A2

Option		Supported Option
A2a	Protection measures for the EESS (passive) in the 23.6-24 GHz frequency band	1

Option		Supported Option
A2b	Protection measures for the EESS (passive) in the 50.2-50.4 GHz and 52.6-54.25 GHz frequency bands	2
A2c	Protection measures for earth stations in the SRS/EESS (25.5-27 GHz (space-to-Earth))	To be developed
A2d	Measures related to transmitting earth stations in the FSS (Earth-to-space) at known locations	To be developed
A2e	Protection measures for the ISS and FSS (Earth-to-space) receiving space stations	To be developed
A2f	Protection measures for the RAS (23.6-24 GHz)	To be developed
A2g	Protection measures for multiple services	To be developed

31.8-33.4 GHz

APG19-5 received a number of proposals which support Method B1 (NOC) for the frequency band 31.8-33.4 GHz. APT Views and PACPs which support Method B1 were developed, accordingly.

APT View(s)

- **31.8-33.4 GHz**

APT Members support Method B1 (NOC), which is the only Method in the CPM Report for the frequency band 31.8-33.4 GHz, due to difficulty of sharing and compatibility between IMT and the incumbent services.

37-40.5 GHz, 40.5-42.5 GHz and 42.5-43.5 GHz

Based on the proposals to APG19-5, APT Members agreed to support identifying the 37-43.5 GHz frequency band, or portions thereof, for IMT globally through Methods C2, D2 and E2 with Alternative 2 together with a new WRC Resolution.

However, these proposals were not necessarily harmonized in terms of the section of Options under the various Conditions in the CPM Report. Therefore, APT Members decided not to create corresponding elements for PACPs to be included in the new WRC Resolution for the frequency band 37-43.5 GHz. APT Members need to further investigate Options to be taken for the respective Conditions towards WRC-19.

Regarding the frequency band 37-40.5 GHz, APT Members also do not support Method C3 in the CPM Report as it is outside the scope of this agenda item since it seeks to consider the additional identification of 37.5-39.5 GHz to high-density applications in FSS for Region 1 through modifications of RR No. **5.516B**.

Based on the discussion above, APT Views and PACPs were developed as shown in Sections 4 and 5 below, respectively.

APT View(s)

- **37-40.5 GHz, 40.5-42.5 GHz and 42.5-43.5 GHz**

APT Members support identifying the 37-43.5 GHz frequency band, or portions thereof, for IMT globally through Methods C2, D2 and E2 with Alternative 2 together with a new WRC Resolution.

In addition, APT Members have the following views on the Options under respective Conditions for Methods C2, D2 and E2 contained in the CPM Report. It should be noted APT Members are still investigating the Options to be selected for these Conditions.

APT Views on Options under the respective Conditions for Methods C2, D2 and E2

Option		Supported Option
C2a	Protection measures for the EESS (passive) in the 36-37 GHz frequency band	To be developed
C2b	Protection measures for the FSS (space-to-Earth)	To be developed
C2c	Protection measures for the SRS (space-to-Earth)	To be developed
C2d	Measures for the SRS (Earth-to-space) and EESS (Earth-to-space)	To be developed
C2e	Protection measures for multiple services	To be developed
D2a	Protection measures for the FSS (space-to-Earth)	To be developed
D2b	Protection measures for the RAS	To be developed
D2c	Protection measures for multiple services	To be developed
E2a	Protection measures for the FSS (Earth-to-space)	To be developed
E2b	Protection measures for the RAS	To be developed
E2c	Protection measures for multiple services	To be developed
E2d	Measures related to transmitting earth stations in the FSS (Earth-to-space) at known locations	To be developed

Regarding the frequency band 37-40.5 GHz, APT Members do not support Method C3 in the CPM Report.

45.5-47 GHz

APG19-5 received proposals by some APT Members which support either Method F1 (NOC) or Method F2 (NOC, Proposal for further ITU-R study) for the frequency band 45.5-47 GHz. After the discussion, APT Members agreed not to support IMT identification in this frequency band at WRC-19. APT Views and PACPs which support NOC were developed, accordingly.

APT View(s)

- **45.5-47 GHz**

APT Members agreed not to support IMT identification in the frequency band 45.5-47 GHz at WRC-19.

47-47.2 GHz

APG19-5 received proposals by some APT Members which support either Method G1 (NOC) or Method G2 (NOC, Proposal for further ITU-R study) for the frequency band 47-47.2 GHz. After the discussion, APT Members agreed not to support IMT identification in this frequency band at WRC-19. APT Views and PACPs which support NOC were developed, accordingly.

APT View(s)

- **47-47.2 GHz**

APT Members agreed not to support IMT identification in the frequency band 47-47.2 GHz at WRC-19.

47.2-50.2 GHz

At APG19-5, some APT Members provided proposals which support Method H1 (NOC) while some other APT Members provided proposals which support Method H2, Alternative 2 (Identification of all or part of the 47.2-50.2 GHz frequency band for the terrestrial component of IMT in Regions or globally). After the discussion, APT Members agreed to further investigate whether this frequency band could be considered for IMT identification at WRC-19.

APT View(s)

- **47.2-50.2 GHz**

APT Members agreed to further investigate whether the frequency band 47.2-50.2 GHz or portions thereof could be considered for IMT identification at WRC-19.

50.4-52.6 GHz

At APG19-5, some APT Members provided proposals which support Method I1 (NOC) while some other APT Members provided proposals which support Method I2, Alternative 2 (Identification of the 50.4-52.6 GHz frequency band for the terrestrial component of IMT in Regions or globally). After the discussion, APT Members agreed to further investigate whether this frequency band could be considered for IMT identification at WRC-19.

APT View(s)

- **50.4-52.6 GHz**

APT Members agreed to further investigate whether the frequency band 50.4-52.6 GHz could be considered for IMT identification at WRC-19.

66-71 GHz

At APG19-5, some APT Members provided proposals which support either

- Method J1 (NOC);
- Method J2 (Identification of the frequency band for IMT in accordance with either Alternative 1 or 2, and removal of the frequency band from RR No. **5.553**);

- Method J3 (To continue studies on the possibility of identification in the frequency band 66-71 GHz for IMT with a WRC Resolution); or
- Method J4 (Identification of the frequency band for IMT in accordance with either Alternative 1 or 2, and retention of the frequency band from RR No. **5.553**).

After the discussion, in principle, APT Members agreed to support identification of the frequency band 66-71 GHz for IMT. However, APT Members are still investigating Method and condition(s) to be adopted when identifying this band for IMT.

APT View(s)

- **66-71 GHz**

In principle, APT Members support identification of the frequency band 66-71 GHz for IMT. However, APT Members are still investigating Method and condition(s) to be adopted when identifying this band for IMT.

71-76 GHz

At APG19-5, some APT Members provided proposals which support either

- Method K1 (NOC);
- NOC at WRC-19 and request to continue the studies on the possibility of the identification of the frequency band for consideration at WRC-23; or
- Method K2 (Identification of the frequency band for IMT in accordance with either Alternative 1 or 2).

After the discussion, APT Members agreed to further investigate whether this frequency band could be considered for IMT identification at WRC-19.

APT View(s)

- **71-76 GHz**

APT Members agreed to further investigate whether the frequency band 71-76 GHz could be considered for IMT identification at WRC-19.

81-86 GHz

At APG19-5, some APT Members provided proposals which support either

- Method L1 (NOC);
- NOC at WRC-19 and request to continue the studies on the possibility of the identification of the frequency band for consideration at WRC-23; or
- Method L2 (Identification of the frequency band for IMT in accordance with either Alternative 1 or 2).

After the discussion, APT Members agreed to further investigate whether this frequency band could be considered for IMT identification at WRC-19.

APT View(s)

- **81-86 GHz**

APT Members agreed to further investigate whether the frequency band 81-86 GHz could be considered for IMT identification at WRC-19.

- **Total Radiated Power (TRP)**

In order to avoid any unintended consequences on the regulatory provisions for other services and applications, APT Members are of the view that in the context of WRC-19 agenda item 1.13 outcomes, description of TRP should be solely limited to the regulatory implementation for this agenda item. Therefore, any changes made as a result of agenda item 1.13 should limit use of the term TRP to IMT.

APT COMMON PROPOSAL ON WRC-19 AGENDA ITEM 1.13

Proposals for the work of the conference

Agenda Item - 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)**;

APT Common Proposals for the frequency band 24.25-27.5 GHz

This Section presents the APT Common Proposals for the frequency band 24.25-27.5 GHz under WRC-19 agenda item 1.13.

Proposal

APT Members support identifying the 24.25-27.5 GHz frequency band for IMT globally through Method A2 together with a new WRC Resolution.

In principle, APT Members support Alternative 2 under Method A2. However, it may be subject to the regulatory provisions to be specified in the new WRC Resolution associated with Condition A2e.

In addition, APT Members have the following views on Options under the respective Conditions for Method A2 contained in the CPM Report. It should be noted that APT Members are still investigating the Options to be selected for some of the Conditions.

APT Views on Options under the respective Conditions for Method A2

Option		Supported Option
A2a	Protection measures for the EESS (passive) in the 23.6-24 GHz frequency band	1
A2b	Protection measures for the EESS (passive) in the 50.2-50.4 GHz and 52.6-54.25 GHz frequency bands	2
A2c	Protection measures for earth stations in the SRS/EESS (25.5-27 GHz (space-to-Earth))	To be developed
A2d	Measures related to transmitting earth stations in the FSS (Earth-to-space) at known locations	To be developed
A2e	Protection measures for the ISS and FSS (Earth-to-space) receiving space stations	To be developed
A2f	Protection measures for the RAS (23.6-24 GHz)	To be developed
A2g	Protection measures for multiple services	To be developed

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations

(See No. 2.1)

MOD ASP/5991A13A1/1

5.338A In the frequency bands 1 350-1 400 MHz, 1 427-1 452 MHz, 22.55-23.55 GHz, 24.25-[TBD] 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-1519)** applies. (WRC-1519)

Reasons: For the protection measures for the EESS (passive) in the frequency band 23.6-24 GHz, APT Members support Option 1 under Condition A2a in the CPM Report. APT Members are still investigating the active service band to be specified in Resolution **750 (Rev.WRC-19)**.

MOD ASP/5991A13A1/2

22-24.75 GHz

Allocation to services		
Region 1	Region 2	Region 3
24.25-24.45 FIXED MOBILE except aeronautical mobile ADD 5.A113 MOD 5.338A	24.25-24.45 MOBILE except aeronautical mobile ADD 5.A113 MOD 5.338A RADIONAVIGATION	24.25-24.45 FIXED MOBILE ADD 5.A113 MOD 5.338A RADIONAVIGATION
24.45-24.65 FIXED INTER-SATELLITE MOBILE except aeronautical mobile ADD 5.A113 MOD 5.338A	24.45-24.65 INTER-SATELLITE MOBILE except aeronautical mobile ADD 5.A113 MOD 5.338A RADIONAVIGATION 5.533	24.45-24.65 FIXED INTER-SATELLITE MOBILE ADD 5.A113 MOD 5.338A RADIONAVIGATION 5.533
24.65-24.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE except aeronautical mobile ADD 5.A113 MOD 5.338A	24.65-24.75 INTER-SATELLITE MOBILE except aeronautical mobile ADD 5.A113 MOD 5.338A RADIOLOCATION- SATELLITE (Earth-to-space)	24.65-24.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE ADD 5.A113 MOD 5.338A 5.533

Reasons: APT Members support allocating the 24.25-25.25 GHz frequency band to the mobile service (except aeronautical mobile) on a primary basis in Regions 1 and 2 and identifying the 24.25-27.5 GHz frequency band for the terrestrial component of IMT globally. “MOD 5.338A” is only applicable to the frequency band contained in the active service band of Resolution **750 (Rev.WRC-19)**, which is still under investigation by APT Members.

ADD ASP/5991A13A1/4

5.A113 The 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. Resolution [A113-IMT 26 GHz] (WRC-19) applies. (WRC-19)

Reasons: APT Members support identifying the 24.25-27.5 GHz frequency band for IMT globally through Method A2 together with a new WRC Resolution. In principle, APT Members support Alternative 2 under Method A2. However, it may be subject to the regulatory provisions to be specified in the new WRC Resolution associated with Condition A2e.

MOD ASP/5991A13A1/5

RESOLUTION 750 (REV.WRC-~~15~~19)

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

The World Radiocommunication Conference (~~Geneva, 2015~~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	Active service band	Active service	Limits of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band ¹
...			
<u>23.6-24.0 GHz</u>	<u>24.25-[TBD] GHz</u>	<u>Mobile</u>	<u>[TBD] dBW in the 200 MHz of the EESS (passive) band for IMT base stations⁵</u> <u>[TBD] dBW in the 200 MHz of the EESS (passive) band for IMT mobile stations⁵</u>

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: For the protection measures for the EESS (passive) in the 23.6-24 GHz frequency band, APT Members support Option 1 under Condition A2a. As for the TBD values, APT Members are still investigating.

DRAFT NEW RESOLUTION [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 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;
- 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 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,

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 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-[TBD] GHz frequency band;

resolves

1 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;

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 results of sharing and compatibility studies;

Reasons: APT Members support the identification of the frequency band 24.25-27.5 GHz for IMT together with the conditions shown in the above new WRC Resolution. It should be noted that APT Members are still investigating the options to be selected for some of the Conditions in the CPM Report, and additional provisions may be required in this Resolution.

APT Common Proposals for the frequency bands 37-40.5, 40.5-42.5 and 42.5-43.5 GHz

Introduction

This Section presents the APT Common Proposals for the frequency bands 37-40.5, 40.5-42.5 and 42.5-43.5 GHz under WRC-19 agenda item 1.13.

Proposal

APT Members support identifying the 37-43.5 GHz frequency band, or portions thereof, for IMT globally through Methods C2, D2 and E2 with Alternative 2 together with a new WRC Resolution.

In addition, APT Members have the following views on Options under the respective Conditions for Methods C2, D2 and E2 contained in the CPM Report. It should be noted APT Members are still investigating the Options to be selected for these Conditions.

APT Views on Options under the respective Conditions for Methods C2, D2 and E2

Option		Supported Option
C2a	Protection measures for the EESS (passive) in the 36-37 GHz frequency band	To be developed
C2b	Protection measures for the FSS (space-to-Earth)	To be developed
C2c	Protection measures for the SRS (space-to-Earth)	To be developed
C2d	Measures for the SRS (Earth-to-space) and EESS (Earth-to-space)	To be developed
C2e	Protection measures for multiple services	To be developed
D2a	Protection measures for the FSS (space-to-Earth)	To be developed
D2b	Protection measures for the RAS	To be developed
D2c	Protection measures for multiple services	To be developed
E2a	Protection measures for the FSS (Earth-to-space)	To be developed
E2b	Protection measures for the RAS	To be developed
E2c	Protection measures for multiple services	To be developed
E2d	Measures related to transmitting earth stations in the FSS (Earth-to-space) at known locations	To be developed

Regarding the frequency band 37-40.5 GHz, APT Members do not support Method C3 in the CPM Report.

ARTICLE 5

Frequency allocations

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

MOD ASP/5993A13A3/1
34.2-40 GHz

Allocation to services		
Region 1	Region 2	Region 3
37-37.5	FIXED MOBILE except aeronautical mobile ADD 5.B113 SPACE RESEARCH (space-to-Earth) 5.547	
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile ADD 5.B113 SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	
38-39.5	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE ADD 5.B113 Earth exploration-satellite (space-to-Earth) 5.547	
39.5-40	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE ADD 5.B113 MOBILE-SATELLITE (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547	

Reasons: APT Members support identifying the 37-43.5 GHz frequency band, or portions thereof, for the terrestrial component of IMT globally.

MOD ASP/5993A13A3/2
40-47.5 GHz

Allocation to services		
Region 1	Region 2	Region 3
40-40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) 5.516B MOBILE ADD 5.B113 MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth)	

40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) <u>MOBILE ADD 5.B113</u> BROADCASTING BROADCASTING-SATELLITE Mobile 5.547	40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) 5.516B <u>MOBILE ADD 5.B113</u> BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite (space-to-Earth) 5.547	40.5-41 FIXED FIXED-SATELLITE (space-to-Earth) <u>MOBILE ADD 5.B113</u> BROADCASTING BROADCASTING-SATELLITE Mobile 5.547
41-42.5	FIXED FIXED-SATELLITE (space-to-Earth) 5.516B <u>MOBILE ADD 5.B113</u> BROADCASTING BROADCASTING-SATELLITE Mobile 5.547 5.551F 5.551H 5.551I	
42.5-43.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile <u>ADD 5.B113</u> RADIO ASTRONOMY 5.149 5.547	

Reasons: APT Members support (i) upgrading 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 (ii) identifying the frequency band 37-43.5 GHz, or portions thereof, for the terrestrial component of IMT globally.

ADD ASP/5993A13A3/3

5.B113 The frequency band 37-43.5 GHz or portions thereof 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 [B113-IMT 40/50 GHZ] (WRC-19) applies. (WRC-19)

Reasons: APT Members support identifying the frequency band 37-43.5 GHz, or portions thereof, for the terrestrial component of IMT globally together with a new WRC Resolution.

ADD ASP/5993A13A3/4

DRAFT NEW RESOLUTION [B113-IMT 40/50 GHZ] (WRC-19)

International Mobile Telecommunications in frequency bands 37-43.5 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;

3 to develop generic unwanted emission characteristics for mobile and base stations of the terrestrial radio interfaces of IMT-2020;

Reasons: APT Members support the identification of the frequency band 37-43.5 GHz, or portions thereof, for IMT together with the conditions shown in the above new WRC Resolution. It should be noted that APT Members are still investigating the options to be selected for the Conditions in the CPM Report, and additional provisions may be required in this Resolution.

ASP/5993A13A3/5

Regarding the frequency band 37-40.5 GHz, APT Members do not support Method C3 in the CPM Report.

Reasons: APT Members are of the view that Method C3 is outside the scope of WRC-19 agenda item 1.13 because it seeks to consider the additional identification of 37.5-39.5 GHz to high-density applications in FSS for Region 1 through modifications of RR No. **5.516B**.

APT Common Proposals for the frequency bands 31.8-33.4 GHz, 45.5-47 GHz, 47-47.2 GHz

This Section includes **No Change** Proposals under ITU PACP

This Section presents the APT Common Proposal for the following frequency bands under WRC-19 agenda item 1.13.

1. 31.8-33.4 GHz
2. 45.5-47 GHz
3. 47-47.2 GHz

Proposal

No change to the RR in these frequency bands.

APT Common Proposals for the frequency band 66-71 GHz

This Section presents the APT Common Proposal for the frequency band 66-71 GHz under WRC-19 agenda item 1.13.

Proposal

In principle, APT Members support identification of the frequency band 66-71 GHz for IMT. However, APT Members are still investigating Method and condition(s) to be adopted when identifying this band for IMT.

- 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,

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) the identification of high-density applications in the fixed-satellite service in the space-to-Earth direction in the bands 39.5-40 GHz in Region 1, 40-40.5 GHz in all Regions and 40.5-42 GHz in Region 2 and in the Earth-to-space direction in the bands 47.5-47.9 GHz in Region 1, 48.2-48.54 GHz in Region 1, 49.44-50.2 GHz in Region 1 and 48.2-50.2 GHz in Region 2 (see No. **5.516B**);
- c) that Resolution **752 (WRC-07)** established a power limit of –10 dBW for stations in the mobile service in the 36-37 GHz band in order to facilitate sharing between active and passive services in this band;
- d) that the relevant standards organizations have standardized an unwanted emission level of –13 dBm/MHz from IMT stations operating in the 37-40 GHz band, which is below the limit in *recognizing c*);
- e) 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 37-43.5 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,

invites ITU-R

- 1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency band 37-43.5 GHz, or portions thereof, 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;

APT Common Proposals for the TRP

This document presents the APT Common Proposal on the treatment of the term TRP (Total Radiated Power) in the context of WRC-19 Agenda item 1.13.

Proposal

In order to avoid any unintended consequences on the regulatory provisions for other services and applications, APT Members are of the view that in the context of WRC-19 agenda item 1.13 outcomes, description of TRP should be solely limited to the regulatory implementation for this agenda item. Therefore, any changes made as a result of agenda item 1.13 should limit the use of the term TRP to IMT.

ASP/6041A13A13/1

In the context of WRC-19 agenda item 1.13 outcomes, description of TRP (Total Radiated Power) should be solely limited to the regulatory implementation for this agenda item. Therefore, any changes made as a result of agenda item 1.13 should limit the use of the term TRP to IMT.

Reasons: This approach can avoid any unintended consequences on the regulatory provisions for other services and applications.

**APT VIEW AND PRELIMINARY APT COMMON PROPOSAL
ON WRC-19 AGENDA ITEM 10B**

Agenda Item 10:

to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention;

1. Background

Agenda item 10 requests WRC-19 to recommend to the Council items for inclusion in the agenda for the WRC-23, and to give its view on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences.

Summary of issues raised during the meeting

IMT 6 GHz

At APG19-5, the following proposal was proposed on new IMT related agenda item for WRC-23

- Studies on frequency-related matters for identification of International Mobile Telecommunications in the frequency range of 5 925-7 125 MHz, or part thereof, for the future development of International Mobile Telecommunications for 2020 and beyond.

At APG 19-5, APT Members carefully examined this proposal and agreed this proposal in the frequency range 7025 - 7125 MHz on WRC-19 Agenda Item 10.

HIBS

At APG19-5, the following proposal was proposed on new IMT related agenda item for WRC-23

- to consider identification of certain frequency bands below 2.7 GHz identified for IMT for use by high altitude platform station as IMT base stations (HIBS), and whether changes are needed to the set of existing bands identified for use by HIBS.

At APG 19-5, APT Members examined this proposal and agreed this proposal on WRC-19 Agenda Item 10.

Sharing studies between MSS and IMT on 2.6 GHz

At APG19-5, the following proposal was proposed on new IMT related agenda item for WRC-23

- to include sharing and coexistence studies between MSS and terrestrial IMT systems in the 2 655-2 690 MHz frequency band as an Agenda to WRC-23 under Agenda 10 of WRC-19

During discussion, different views were expressed:

- Some APT Members propose and support to include this study as the possible new agenda for WRC-23 to ensure the study, because it would be difficult to resolve the interference through bi-lateral discussion.
- Some APT Members think that this issue should be resolved via bi-lateral discussion rather than WRC-23 new agenda item. Some APT Members also believe this issue should

be raised to the awareness of the Radio Regulation Board for consideration, hence this is not a matter to be considered as a possible new Agenda item for WRC-23.

After discussion, APT Members could not reach consensus to develop the preliminary APT Common Proposal for a possible new agenda item for WRC-23 on this topic.

Some APT Members noted the interference case reported by India to the MSS from the terrestrial IMT in 2655-2690 MHz and that Resolution 225 (Rev.WRC-12) recognizes that that studies of potential sharing and coordination between the satellite component of IMT and the terrestrial component of IMT, mobile-satellite service applications and other high-density applications in other services such as point-to-multipoint communication/distribution systems in the bands 2 500-2 520 MHz and 2 670-2 690 MHz bands are not finished. Accordingly some APT Members agreed that the studies on this matter should be completed as a matter of priority and recommend that the matter may be taken out to RA by concerned administrations.

APT View(s)

APT Members support the following items to be included in the agendas of WRC-23:

- Studies on frequency-related matters for identification of International Mobile Telecommunications in the frequency range of 7 025-7 125 MHz for the future development of International Mobile Telecommunications for 2020 and beyond.
- to consider identification of certain frequency bands below 2.7 GHz identified for IMT for use by high altitude platform station as IMT base stations (HIBS), and whether changes are needed to the set of existing bands identified for use by HIBS.

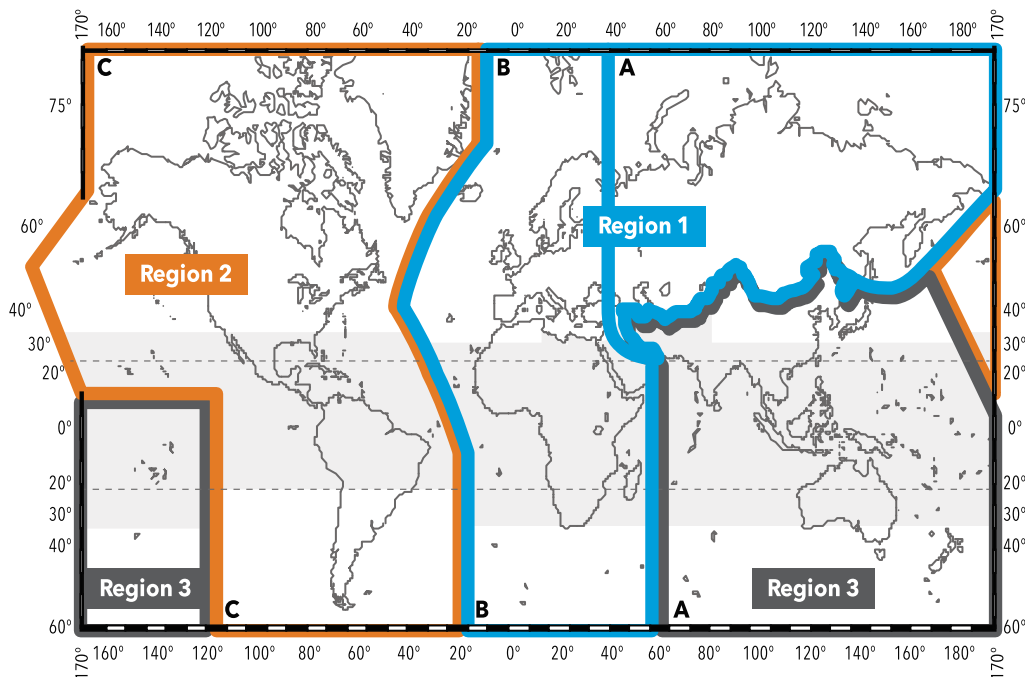
APT Members recognize that India is facing the issue of interference to MSS from the terrestrial IMT systems in the 2 655-2 690 MHz frequency band.

ITU-APT Foundation proposals for Agenda item 1.13

Frequency Band	Identification of IMT-2020 and Proposed Method – Views of the Mobile Industry	Conditions Associated with Views of the Mobile Industry	Conditions Associated with Views of the satellite Industry
24.25-27.5 GHz (Band A)	Yes Identify for IMT Start of the band TBD Method A2, Alternative 2	Condition A2a: Option 1 – Resolution 750 (Rev.WRC-19)with IMT unwanted emission limits in table 1 for the 23.6 to 24.0 GHz frequency band to protect EESS (passive): IMT2020 BS: -33.5 dB(W/200 MHz) IMT2020 UE: -29.7 dB(W/200 MHz)	
		Condition A2b: Option 2, Limits in Table 1-1-TBD	
		Condition A2c: Option 5 Condition A2d: Option 4 Condition A2e: Option 9 Condition A2f: Option 3 Condition A2g: Option 5 No Condition Necessary	Condition A2d Option 1 Condition A2e Option 3 (with 37 dBm/200 MHz) Condition A2g Option 3 or 4
		Draft ITU-R Resolution [A113-IMT 26 GHZ] (WRC-19)	
31.8-33.4 GHz (Band B)	No Identification for IMT , Method B1 (No Change)		
37.0-43.5 GHz (Band C)	Support identifying the 37-43.5 GHz frequency band, or portions thereof, for IMT through Methods C2, D2 and E2 with Alternative 2 together with a new WRC Resolution.	Condition C2a: Option 2 – Condition C2b: Option 6 – Condition C2c: Option 3 – Condition C2d: Option 2 – Condition C2e: Option 3 – Condition D2a: Option 6 – Condition D2b: Option 3 – Condition D2c: Option 3 – Condition E2a: Option 7 – Condition E2b: Option 3 – Condition E2c: Option 5 – Condition E2d: Option 3 – No Conditions necessary	Draft ITU-R Resolution [B113-IMT 40/50GHZ] Conditions D2a Option 1. Condition E2a Option 2 (with 40 dBm/200 MHz) Condition E2c Option 3 or 4 Condition E2d Option 1,
45.5-52.6 GHz (Bands F, G,H,I)	Further studies are necessary to consider identification		
66-71 GHz (Band J)	Further studies are necessary to consider identification		
71-76 GHz (Band K)	Further studies are necessary to consider identification		
81-86 GHz (Band L)	Further studies are necessary to consider identification		

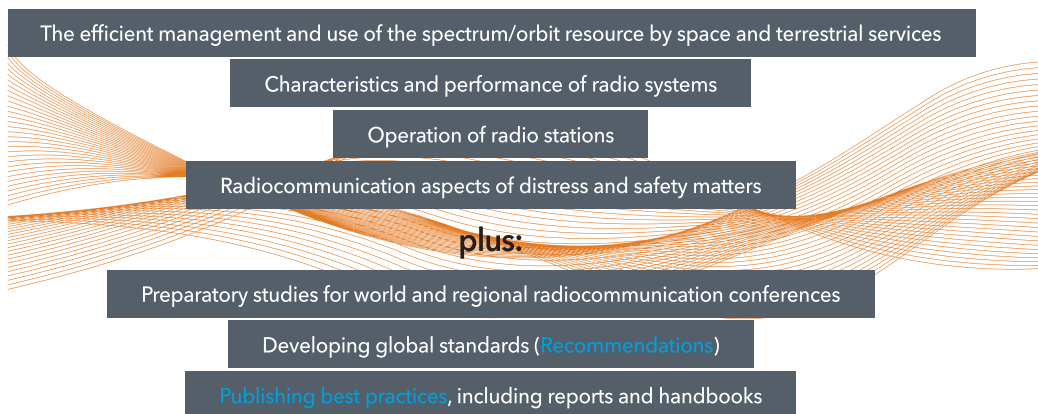
For the allocation of radio spectrum frequencies the world is divided into three regions

Region 1	Region 2	Region 3
Arab States	Americas	Asia-Pacific
Africa		
Europe		
Commonwealth of Independent States		

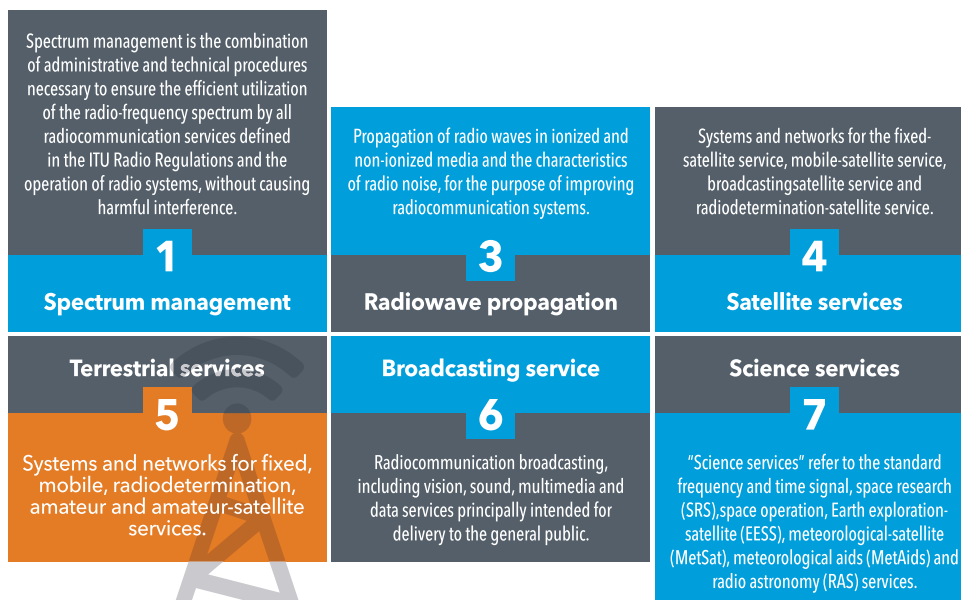


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Published by : ITU-APT Foundation of India
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