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|  | ASIA-PACIFIC TELECOMMUNITY | |
| **The APT Wireless Group** |  |
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**APT Wireless Group Workplan**

*Updated at AWG-24, 17-21 September 2018*

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# 1. AWG STRUCTURE:

AWG is consists of Plenary and three Working Groups (WGs). Sub-Working Groups (Sub-WG) and Task Groups (TGs) are formed under the WGs. Following AWG structure was approved at AWG-19 held from 2 to 5 February 2016 in Chiang Mai, Thailand and updated at AWG-24 held from 17 to 21 September 2018 in Bangkok, Thailand.

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| **Working Group on Spectrum Aspects**  **(wg SPEC)** | **Working Group on Technology Aspects**  **(WG TECH)** | **Working Group on Services and Applications**  **(WG S&A)** |
| Sub Working Group on Spectrum Arrangement and Harmonization  (Sub-WG SA&H**)** | Sub Working Group on IMT  (Sub-WG IMT) | Task Group on Modern Satellite Applications  (TG MSA) |
| Task Group High Altitude Platform Station (TG HAPS) | Task Group on Aeronautical and Maritime (TG A&M) |
| Sub Working Group on Sharing Studies  (Sub-WG SS) | Task Group on Fixed Wireless Systems (TG FWS) | Task Group on PPDR  (TG PPDR) |
| Task Group on Internet of Things (TG IoT) | Task Group on Railway Radiocommunications  (TG RR) |
| Sub Working Group on Spectrum Monitoring  (Sub-WG SM) | Task Group on Intelligent Transportation Systems  (TG ITS) |  |
| Task Group on Wireless Power Transmission  (TG WPT) |

# 2. TERMS OF REFERENCE OF THE AWG WORKING GROUPS

**Inside APT:**

* APG
* ASTAP
* PRF, SATRC

**Outside APT:**

* ITU-R SGs
* CEPT, 3GPP etc.

**Inside APT:**

* APG
* ASTAP
* PRF, SATRC

**Outside APT:**

* ITU-R SGs
* CEPT, 3GPP etc.

**Inside APT:**

* APG
* ASTAP
* PRF, SATRC

**Outside APT:**

* ITU-R SGs
* CEPT, 3GPP etc.

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| **WG Spec** | * To develop plans for harmonized spectrum usage for radiocommunication systems in the region; * To develop optimum sharing methodologies, conduct coexistence and compatibility studies between radiocommunication services and systems to ensure compatibility; * To study the impact of interference to radiocommunication services from other sources; * To coordinate efforts to eliminate harmful interference between concerned countries, as appropriate. |
| **WG Tech** | * To carry out studies and develop deliverables which facilitate development of new wireless technologies; * To share information on emerging wireless technologies, including use cases of the technologies; * To encourage industry research and development; * To perform studies of technical and operational matters related to WRC issues, in order to assist APT Members’ to have a better understanding of the issues; * To conduct technical consultation based upon the requests of APT Members to meet the needs of the developing countries, and reflect in the work and deliverables of the WG TECH; * To identify the spectrum requirements for new radio technologies. |
| **WG S&A** | * To carry out studies and develop deliverables which facilitate the introduction of new wireless applications and radiocommunication services; * To perform the study on implementation and deployment of radiocommunication services and applications; * To perform studies related to WRC issues in the scope of WG S&A, in order to assist APT Members’ to have a better understanding of the issues; * To study market and user requirements of wireless services and applications; * To share information on emerging wireless applications; * To develop and update recommendations and reports, other documentation, on wireless services and applications; and * To ensure that the requirements and needs of the developing countries are reflected in the work and deliverables of the WG S&A. * To identify the spectrum requirements for wireless applications and services |

**3. TERMS OF REFERENCE OF THE SUB WORKING GROUPS AND TASK GROUPS**

**Sub Working Groups of WG Spectrum Aspects**

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| **Sub-WG SA&H** | * To review the availability of spectrum resulting required for the introduction of new system technologies or revised allocations and the potential new or alternative uses of the spectrum thus made available for new applications; * To develop recommended harmonized approaches for the introduction of new wireless technologies, services and application in such spectrum, including preferred frequency band and associated technical characteristics; * To develop APT Recommendations/Reports on spectrum arrangement and/or harmonization; * To review any draft texts on spectrum arrangement and/or harmonization, which may be included in APT Recommendations and/or Reports already developed in AWG. |
| **Sub-WG SS** | * To conduct sharing and compatibility studies between different systems and applications in the same and adjacent bands; * To study characteristics and methodologies for modelling and simulation to support the above-mentioned sharing and compatibility studies; * To study techniques and technical conditions for sharing and compatibility among these systems and applications; * To develop related APT Reports and/or Recommendations and other documentation resulting from these studies; * To review any draft texts on sharing and compatibility matters which may be included in APT Recommendations and/or Reports already developed in AWG. |
| **Sub-WG SM** | * To share information on spectrum monitoring and analysis methods with spectrum monitoring systems and to set up programs such as frequency occupancy measurement; * To share members’ case studies on harmful interference and its elimination; * To promote the introduction and implementation of new technologies and applications which could be used in spectrum monitoring activities in the Asia-Pacific region; * To exchange views and develop the methods for cooperation  on preventing interference between neighboring countries; * To share information and good practices on the planning, operational, management and maintenance method of monitoring stations and other facilities and to develop related AWG documents; * To facilitate the deployment of the APT Frequency Information System (AFIS). |

**Sub Working Groups and Task Groups of WG Technology Aspects**

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| **Sub-WG IMT** | * To review activities on the future development of IMT discussed in the ITU-R Working Party 5D (WP 5D) and relevant organizations; and * To study technology related aspects of the on-going and future development and implementation of IMT in the Asia-Pacific region. |
| **TG HAPS** | * To study the operational scenarios and deployment of HAPS in APT region; * To share information about HAPS on current status of frequency usage and national regulatory experiences in Asia-Pacific region, relevant technical standards, technical evolving trends, and studies upon HAPS in relevant international and regional organization; * To study market and user requirements of HAPS; * To develop related APT Recommendations/Reports and other documentation resulting from above activities |
| **TG FWS** | * To gather following national information regarding fixed wireless systems: * Frequency planning and usage; * Licensing conditions; * Usages and applications; * Standardization activities; * To study on following questions regarding fixed wireless systems: * Current status of frequency planning and usage, frequency assignment, band width, main usages and applications; * Trends on technology development and R&D prospects on future usages and new applications; * Based on the above studies, to develop reports and/or recommendations as appropriate. |
| **TG IoT** | * To study technical and operational characteristics of IoT and carry out studies on the working scenarios, wireless systems and applications for implementation and development of IoT in APT region ; * To share information on advanced technologies related to IoT with APT Members. * To share information about IoT on current status of regulation and frequency use in Asia-Pacific region, relevant technical standards, technical evolving trends, and studies upon IoT in relevant international and regional organization; * To study market and user requirements of IoT; * To identify the implications of spectrum management for IoT; * To develop related APT Recommendations/Reports or other documentation resulting from above activities and, * To enhance and timely update the published APT Recommendation/Reports on SRD, UWB and RFID |
| **TG ITS** | * To share information on current status of regulation and frequency use of ITS radio system; * To determine the spectrum needs (if any) of ITS radio communications; * To invite and collect information relevant to possible regional harmonization of ITS radio-communications spectrum, taking into account the trends and studies towards spectrum harmonization, applications and standards developments; * To share information on current status of introduction and development of ITS radio system; * To study and discuss useful ITS applications and standardization in the Asia-Pacific region; * To develop Recommendations and Reports on ITS Radiocommunications as required. |
| **TG WPT** | - To gather following information   * + Applications Potential market   + Relevant technical and operational characteristics for WPT   + Standardization efforts in the world * To study following questions   + What category of spectrum usage could administrations consider? (e.g., ISM or others)   + What radio frequency bands are suitable for WPT?   + What steps are required to make sure radio services protected from the usage of WPT?   + What are impacts on human body from RF exposure of WPT? * Based on the above studies, to develop the recommendation and/or report, as appropriate. |

**Task Groups of WG Service and Applications**

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| **TG MSA** | * To assist the requirements of the APT membership in putting into practice modern satellite applications in a national context. * In this context, to develop reports on satellite applications in the Asia Pacific Region, such as satellite communication systems, satellite devices, key components, interfaces, interconnection and intercommunication, licensing, Ka-band applications and deployment, satellite broadband applications, new applications of mobile satellite, disaster relief applications etc., to serve the mutual interests inside the APT and outside, for instance in the ITU-R Study Group 4, without overlapping with the activities of APG. * To study and develop possible techniques that may be used to improve the compatibility between satellite and other services. |
| **TG A&M** | * To consider the following issues of the use of mobile phone as well as the use of other modern wireless technologies on-board the aircraft and vessels:   For the use of mobile phones on-board the aircraft and vessels:   * + - Licensing issues and possible ways to harmonize the approach to licensing by APT members such as mutual recognition while taking due account of national differences;     - Spectrum matters noting that currently a number of different frequency bands and different mobile technologies are in use in the Asia-Pacific region; and     - Researching technical requirements especially in regard to the capability of the equipment on-board the aircraft and vessels as well as the technical and operational conditions of each country being over-flown.     For other wireless technologies:   * + - Service and application issues including technical characteristics, preferred frequency bands and the use of these frequency bands.     - Associated regulatory and licensing issues, when considered appropriate. and     - To study and review future wireless communication technologies on aeronautical and maritime |
| **TG RR** | * To study the operational scenarios and deployment of railway radiocommunication systems; * To share information about railway radiocommunication systems on current status of spectrum usage and national regulatory experiences in Asia-Pacific region, relevant technical standards, technical evolving trends, and studies upon railway radiocommunication systems in relevant international and regional organizations; * To study the system description, architecture, functionality and service requirements etc. of railway radiocommunication systems; * To develop related APT Recommendations/Reports and other documentation resulting from above activities; * To provide information on various potential services and applications, and success factors to deliver services and applications for railway radiocommunication systems. |
| **TG PPDR** | * Study the working scenarios and implementation strategies of PPDR Radiocommunications; * Develop Reports and recommendations on PPDR technologies, user requirements, spectrum requirements and implementation strategies; * Share information about PPDR radiocommunication on current status of spectrum usage and deployment scenarios in Asia-Pacific region, relevant technical standards, technical evolving trends with relevant international and regional organizations; * Develop related APT Recommendations/Reports and other documentation resulting from above activities. |

# 4. LIST OF THE OFFICE BEARERS

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| **AWG**  **Chairman** | **Dr. Kohei Satoh**  Association of Radio Industries and Businesses (ARIB)  Japan  E-mail: [satoh@arib.or.jp](mailto:satoh@arib.or.jp) | **AWG Vice-Chairman** | **Ms. Zhu Keer Ministry of Industry and Information Technology, China (People's Republic of) E-mail:** [zhukeer@miit.gov.cn](mailto:zhukeer@miit.gov.cn) |
| **AWG Vice- Chairman** | **Mr. Le Van Tuan**  Authority of Radio Frequency Management, Socialist Republic of Vietnam  E-mail: [tuanlv@rfd.gov.vn](mailto:tuanlv@rfd.gov.vn) | **Chairman WG Spec** | **Mr. John Lewis**  Added Value Applications, New Zealand  Email: [john.lewis@ties.itu.int](mailto:john.lewis@ties.itu.int) |
| **Chairman WG Tech** | **Dr. Dae Jun Kim**  TTA, Republic of Korea  E-mail : [kdj@tta.or.kr](mailto:kdj@tta.or.kr) | **Chairman WG S&A** | **Dr. Eng. Khoirul Anwar**  Telkom University  Indonesia  Email: [anwarkhoirul@telkomuniversity.ac.id](mailto:anwarkhoirul@telkomuniversity.ac.id) |

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| **Sub-WGs of WG SPEC** | | | |
| **Sub-WG SA&H** | **Ms. Lyu Boya**  Huawei Technologies Co. Ltd., China **(People's Republic of)**  **Email:** [lvboya@huawei.com](mailto:lvboya@huawei.com) | **Sub-WG Sharing** | **Mr. Alex Orange**  Qualcomm International Inc., Hong Kong  E-mail : [aorange@qti.qualcomm.com](mailto:aorange@qti.qualcomm.com)  **Dr. Jung Soo Woo**  Samsung Electronics, Republic of Korea  Email: [jungsoo.woo@samsung.com](mailto:jungsoo.woo@samsung.com) |
| **Sub-WG SM** | **Mr. Huang Jia**  State Radio Monitoring Center, China **(People's Republic of)**  **Email:** [ferrero.huang@srrc.org.cn](mailto:ferrero.huang@srrc.org.cn) |  |  |
| **Sub-WG and TGs of WG TECH** | | | |
| **Sub-WG IMT** | Mr. Yasuhiro KATO ARIB, Japan  [y-kato@arib.or.jp](mailto:y-kato@arib.or.jp) | **TG HAPS** | **Dr. Lang Baozhen**  **China Academy of Information and Communications Technology**  China (People's Republic of)  E-mail : [langbaozhen@sina.cn](mailto:langbaozhen@sina.cn) |
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| **TG ITS** | **Mr. Satoshi Oyama Association of Radio Industries and Businesses (ARIB) Japan Email :** [s-oyama@arib.or.jp](mailto:s-oyama@arib.or.jp) | **TG WPT** | **Dr. Chan Hyung Chung**  Director, Association (RAPA)  Republic of Korea  Email: [backbum@rapa.or.kr](mailto:backbum@rapa.or.kr) |
| **TGs of WG S&A** | | | |
| **TG MSA** | **Ms. Masmurni Binti Abdul Rahman Measat Satellite Systems Sdn Bhd, Malaysia Email :** [masmurni@measat.com](mailto:masmurni@measat.com) | **TG RR** | **Mr. Liu Bin**  State Radio Monitoring Center, China (People’s Republic of)  Email: [liubin@srrc.org.cn](mailto:liubin@srrc.org.cn) |
| **TG A&M** | **Dr. Xu Ying**  State Radio Monitoring Center,  China (People's Republic of)  E-mail: [xuying@srrc.org.cn](mailto:xuying@srrc.org.cn) |  |  |
| **TG PPDR** | **Mr. Bharat Bhatia**  Motorola India Pvt. Ltd.  E-mail : [bharat.bhatia@motorola.com](mailto:bharat.bhatia@motorola.com) |  |  |

**APT Secretariat Contacts**

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| **Mr. Forhadul Parvez**  Programme Officer  Asia-Pacific Telecommunity (APT)  12/49, Soi 5, Chaengwattana Road  Bangkok 10210, Thailand  Tel: 66-2-5730044 (Ext: 107)  Email: [parvez@apt.int](mailto:parvez@apt.int); [aptawg@apt.int](mailto:aptawg@apt.int) |  |

# 5. MICRO WORKPLAN

**Sub Working Groups of Working Group Spectrum Aspects**

***Sub-Working Group – Spectrum Arrangements and Harmonization***

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| **Title** | **Harmonized frequency arrangement in the band 3 300 – 3 400 MHz** |
| **Document Type** | Report |
| **Group/Chair** | WG-SPEC/Sub-WG 1/Ms. LYU Boya |
| **Editor(s)** |  |
| **Scope** | To develop possible harmonized frequency arrangement in the band 3 300-3 400MHz in APT region |
| **Purpose** | To develop APT Report for harmonized frequency arrangement in the band 3 300-3 400MHz for IMT systems  To develop contribution to ITU-R WP5D with respect to frequency arrangement in the band 3 300-3 400MHz for IMT systems |
| **Related Document** | Recommendation ITU-R M.1036-5 |
| **Related Organization** | ITU-R  3GPP |
| **Timelines** | **2016**   * AWG-19:   + Develop work plan   + Discuss the structure of the working document * AWG-20:   + Develop a working document towards a draft new APT/AWG Report on harmonized frequency arrangement in the band 3 300 – 3 400 MHz based on the contributions and meeting discussions.   + Inform the study progress to ITU-R WP5D, as appropriate   **2017**   * AWG-21:   + Continue to develop the working document towards a draft new APT/AWG Report on harmonized frequency arrangement in the band 3 300-3 400 MHz based on the contributions and meeting discussions.   + Review the study results in other AWG sub-Working groups   + Inform the study progress to ITU-R WP5D, as appropriate * AWG-22:   + - Continue to develop the working document towards a draft new APT/AWG Report on harmonized frequency arrangement in the band 3 300-3 400 MHz based on the contributions and meeting discussions.     - Review the study results in other AWG sub-Working groups     - Inform the study progress to related organization as appropriate.   2018   * AWG-23:   + - Continue to develop the working document towards drat new APT/AWG Report on harmonized frequency arrangement in the band 3 300-3 400 MHz based on the contributions and meeting discussions     - Review the study results in other AWG sub-Working groups     - Inform the study progress to related organization as appropriate.     - AWG-24:     - Continue to develop the working document towards drat new APT/AWG Report on harmonized frequency arrangement in the band 3 300-3 400 MHz based on the contributions and meeting discussions     - Review the study results in other AWG sub-Working groups     - Inform the study progress to related organization as appropriate     - AWG-25     - Finalize APT/AWG Report on harmonized frequency arrangement for IMT in the band 3300-3400 MHz     - Inform the study progress to related organisation as appropriate   Note: this timeline will be reviewed at every AWG meeting and may be extended to AWG-26 |

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| **Title** | **Frequency arrangements in the band 4 800 – 4 990 MHz** |
| **Document Type** | Report |
| **Group/Chair** | WG-SPEC/Sub-WG 1/Ms.LYU Boya |
| **Editor(s)** |  |
| **Scope** | To develop possible frequency arrangements in the band 4 800-4 990MHz for administrations wishing to implement IMT in APT region |
| **Purpose** | To develop APT Report for frequency arrangements in the band 4 800-4 990MHz for IMT systems  To develop contribution to ITU-R WP5D with respect to frequency arrangements in the band 4 800-4 990MHz for IMT systems |
| **Related Document** | Recommendation ITU-R M.1036-5 |
| **Related Organization** | ITU-R  3GPP |
| **Timelines** | **2016**   * AWG-19:   + Develop work plan   + Discuss the structure of the working document * AWG-20:   + Develop a working document towards a draft new APT/AWG Report on frequency arrangements in the band 4 800 – 4 990 MHz based on the contributions and meeting discussions.   + Inform the study progress to ITU-R WP5D, as appropriate   **2017**   * AWG-21:   + Continue to develop the working document towards a draft new APT/AWG Report on frequency arrangements in the band 4 800 – 4 990 MHz based on the contributions and meeting discussions.   + Review the study results in other AWG sub-Working groups   + Inform the study progress to ITU-R WP5D, as appropriate * AWG-22:   + Continue to develop the working document towards a draft new APT/AWG Report on frequency arrangements in the band 4 800 – 4 990 MHz based on the contributions and meeting discussions.   + Review the study results in other AWG sub-Working groups   + Inform the study progress to related organization as appropriate.   **2018**   * AWG-23:   + Continue to develop the working document towards draft new APT/AWG Report on harmonized frequency arrangement for IMT in the band 4 800-4 990 MHz based on the contributions and meeting discussions.   + Review the study results in other AWG sub-Working groups   + Inform the study progress to related organization as appropriate. * AWG-24:   + Continue to develop the working document towards draft new APT/AWG Report on harmonized frequency arrangement for IMT in the band 4 800-4 990 MHz based on the contributions and meeting discussions.   + Review the study results in other AWG sub-Working groups   + Inform the study progress to related organization as appropriate.   **2019**   * AWG 25:   + Finalize new APT/AWG Report on harmonized frequency arrangement for IMT in the band 4 800-4 990 MHz   + Inform the study progress to related organization as appropriate.   Note: this timeline will be reviewed at every AWG meeting and may be extended to AWG-26 |

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| **Title** | **Studies on frequency arrangement(s) in the band 1 427 – 1 518 MHz** |
| **Document Type** | Report |
| **Group/Chair** | WG-SPEC/Sub-WG 1/Ms LYU Boya |
| **Editor(s)** |  |
| **Scope** | To provide technical and regulatory considerations on development of the frequency arrangement(s) in the band 1 427 – 1 518 MHz and possible harmonized frequency arrangement(s) for IMT systems in the band for the Asia-Pacific region |
| **Purpose** | To provide administrations in the Asia-Pacific region wishing to implement IMT systems with relevant information on development of the frequency arrangement(s) in the band 1 427 – 1 518 MHz.  To reflect the views of these administrations in the region into the on-going work in ITU-R WP 5D, as necessary. |
| **Related Document** | Recommendation ITU-R M.1036-5  Resolution 223 (Rev.WRC-15)  Resolution 750 (Rev.WRC-15)  Resolution 761 (WRC-15) |
| **Related Organization** | ITU-R  3GPP |
| **Timelines** | **2016**  **AWG-20**   * + Develop a workplan for the studies   + Discuss and develop a working document towards a draft new APT/AWG Report on frequency arrangement(s) in the band 1 427 – 1 518 MHz based on the contributions and meeting discussions.   **2017**  **AWG-21**   * + Continue to develop the working document based on the contributions and meeting discussions.   + Review the study results in other AWG sub-Working groups   + Develop a questionnaire   **AWG-22**   * + Review responses to the questionnaire   + Continue to develop the working document based on the contributions and meeting discussions.   **2018**  **AWG-23**   * + Review responses to the questionnaire   + Continue to develop the working document based on the contributions and meeting discussions .   **AWG-24**   * + Review responses to the questionnaire   + Continue to develop the working document based on the contributions and meeting discussions.   **2019**  **AWG-25**   * + Finalize a drat APT/AWG Report on studies on frequency arrangement(s) for IMT in the band 1427-1518 MHz for approval in the AWG Plenary   + Review the study results from other AWG sub-working groups   + Inform results of the studies to the related organization, as appropriate.   Note: this timeline will be reviewed at every AWG meeting and may be extended to AWG-26 |

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| --- | --- |
| **Title** | **Frequency Ranges for Non-Beam WPT for Mobile Devices** |
| **Document Type** | APT Recommendation |
| **Group/Chair** | WG-TECH/TG WPT/Mr. Chan Hyung Chung WG-SPEC/SWG SA&H/Ms. LYU Boya |
| **Editor(s)** | Mr. Song Qiaojian (Apple South Asia Pte Ltd)  Mr. Se Ho Park (Samsung) |
| Scope | Draft and complete the APT Recommendation on frequency ranges for non-beam WPT technologies for mobile devices.  In addition to 6765 kHz – 6795 kHz (see RR No. 5.138), 100-300 kHz frequency range will be added in the recommendation with impact studies. |
| **Purpose** | Study and identify frequency ranges for non-beam WPT technologies for mobile devices:   1. Not to cause harmful interference to radiocommunication services; 2. To facilitate smooth deployment of WPT systems without spectrum concerns; 3. To maximize users’ benefit of WPT given by global or regional spectrum harmonization; 4. To address APT administrations to take appropriate regulatory measures on spectrum that should be taken into consideration when WPT is deployed. |
| **Related Document** | 1. APT Survey Report on WPT 2. APT Report on WPT (APT/AWG/REP-62(Rev.1)) 3. ITU-R Question ITU-R 210-3/1 4. APT recommendation on frequency ranges for Non-Beam WPT for mobile devices 5. Report ITU-R SM.2303-1“Wireless power transmission using technologies other than radio frequency beam” 6. Recommendation ITU-R SM.2110-0 “Frequency ranges for operation of non-beam wireless power transmission systems” |
| **Related Forums and Organization** | ITU-R SG1, WP 1A, and WP 1B |
| **Timelines** | **2016**   * AWG-19:   + Development of the Work Plan at WG-TECH   + Handover to WG-SPEC for spectrum requirements and related matters * AWG-20   + Initiation of new work   + Introduction of the work plan to WG-SPEC / Sub-WG SA&H   **2017**   * AWG-21   + Review spectrum requirements of WPT for mobile devices   + Review the latest ITU-R Preliminary Draft New Recommendation (PDNR) on WPT   + Development of the APT PDNR for mobile devices * AWG-22   + Review spectrum requirements of WPT for mobile devices   + Review the ITU-R approved Recommendation   + Finalize the new APT recommendation for mobile devices.   + Develop the questionnaire on Non-ISM frequency bands for Non-Beam WPT for mobile devices.   **2018**   * AWG-23   + Studies on Spectrum impact of WPT to radiocommunication services.   + Collect the responses and summarize the regulatory status in APT member countries for non-beam WPT for mobile devices.   + Review the ITU-R Recommendation and activity.   + Finalize the revision of APT recommendation for mobile devices * AWG-24   + Studies on Spectrum impact of WPT to radiocommunication services.   + Summarize the regulatory status in APT member countries for non-beam WPT for mobile devices.   + Review the ITU-R Recommendation and activity. * AWG-25   + Finalize studies on Spectrum impact of WPT to radiocommunication services.   + Review the ITU-R Recommendation and activity.   + Finalize the revision of APT recommendation for mobile devices |

***Sub-Working Group Spectrum Monitoring***

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| **Title** | APT REPORT ON SPECTRUM MONITORING TECHNIQUES AND METHODS UNDER MULTI-PATH ENVIRONMENT |
| **Document Type** | Report |
| **Group / Chair** | Spectrum sub-Working Group-Spectrum Monitoring /Mr. HUANG Jia |
| **Editor(s)** |  |
| **Scope** | To study and summarize the spectrum monitoring techniques and methods which could be used by administrations in APT region for spectrum monitoring under multi-path environment. |
| **Purpose** | To provide solution examples or references for the spectrum monitoring techniques and methods under multi-path environment to administrations in APT region |
| **Related Document** |  |
| **Related Organization** | ITU-R |
| **Timelines** | AWG-23/24/25 (2018, 2019)   * Consider the input contribution and draft working document   AWG-26(2020)   * To finalize the Report |

***Sub-Working Group Sharing Studies***

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| **Title** | **Sharing and Compatibility Studies for Selected Frequency Bands Below 6 GHz** |
| **Document Type** | APT Report and liaison statement to APG |
| **Group/Chair** | WG-SPEC/Sub-WG Sharing Studies/Mr. Alex Orange |
| **Editor(s)** | TBD |
| **Scope** | To review ITU-R studies on the following frequency bands:   * 1 452 – 1492 MHz (WRC-19 Agenda Item 9.1 CPM Report Issue 9.1.2) * 1 980 – 2 010 / 2 170 – 2 200 MHz (WRC-19 Agenda Item 9.1 CPM Report Issue 9.1.1) * And to undertake further sharing and compatibility studies if requested by APG.   To conduct sharing and compatibility studies to facilitate IMT implementation and not related to WRC-19 for the interested APT members:   * 470-698 MHz * 1427-1452 MHz * IMT in 1492-1518 MHz and MSS in 1518-1525 MHz * 3 300 – 3 400 MHz * 4 400 – 4 500 MHz * 4 800 – 4 990 MHz   Note: frequency ranges above are an initial list. This list could be updated in future AWG meetings. |
| **Purpose** | * To conduct sharing and compatibility studies between IMT and other services within the APT region on the listed and neighboring frequency bands. * To develop material from an APT perspective and send relevant results of these studies of those bands that are relevant for WRC-19 to APG. * To develop APT Report in accordance with relevant study results. |
| **Related Document** |  |
| **Related Organization** | ITU-R |
| **Timelines** | **2016**  **AWG-19 (2016 Feb.)**   * Identify the frequency bands requiring the sharing study in AWG. * Develop work plan and timeline for the joint task group. * Adopt the work plan and frequency bands requiring sharing studies. * Provide additional questionnaires to TG IMT on the survey. * Inform the initiation of this study to APG 19-1.   **AWG-20 (2016-Sep.)**   * Update the work plan * Consider input contributions. * Develop a working document towards a preliminary draft new Report in relation to listed frequency bands.   **2017**  **AWG-21(2017 -Apr.)**   * Consider and review the input contributions. * Further develop a working document towards a preliminary draft new Report in relation to a frequency band.   **AWG-22 (2017-Sep.)**   * Discuss the input contributions. * Develop the working document towards a preliminary draft new Report. * Submit study results to APG and relevant ITU-R groups as appropriate.   **2018**  **AWG-23 (2018-1Q)**   * Discuss the input contributions. * Further develop Complete the working document towards a preliminary draft new Report. * Submit study results to APG and relevant ITU-R groups as appropriate.   **AWG-24 (2018-3Q)**   * Finalize the draft new Report and approve it. * Complete the working document towards a preliminary draft new Report. * Submit study results to APG and relevant ITU-R groups as appropriate   **AWG-25 (2019-2Q)**   * Finalize the draft new Report and approve it. |

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| **Title** | **Studies related to techniques and technical conditions for Licensed-Assisted Access (LAA) and 5G New Radio - Shared Spectrum (5G NR-SS) as national solutions for accessing shared spectrum** |
| **Document Type** | APT Report |
| **Group/Chair** | WG-SPEC/Sub-WG Sharing Studies/Mr. Alex Orange |
| **Editor(s)** | TBD |
| **Scope** | To undertake Studies related to techniques and technical conditions for Licensed-Assisted Access (LAA) and 5G New Radio - Shared Spectrum (5G NR-SS) as national solutions for accessing shared spectrum |
| **Purpose** | * To conduct the studies in the scope section above to inform APT Members of existing technologies and techniques for improving the utility and capability of mobile network deployments in their jurisdictions by leveraging “unlicensed” spectrum bands. * To develop APT Report in accordance with relevant study results. |
| **Related Document** | APT AWG Report REP-07 (Rev.5) and APT AWG REP-35 |
| **Related Organization** | 3GPP, ETSI, CEPT, FCC |
| **Timelines** | **AWG-23 (2018-1Q)**   * Adopt the draft work plan * Invite contributions on technical, operational, standards, and regulatory developments related to LAA. * Develop the working document towards a preliminary draft new Report.   **AWG-24 (2018-3Q)**   * Discuss received contributions * Adjust work plan if required * Complete the working document towards a preliminary draft new Report   **AWG-25 (2019-2Q)**   * Discus received contributions * Complete the working document towards a preliminary draft new Report * **AWG-26 (2020-1Q)** Discuss received contributions * Finalize the draft new Report and approve it |

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| **Title** | **Report on mitigation measures to improve coexistence of 4G-LTE and 5G-NR operating in the 3400 - 3600 MHz band and other systems operating in adjacent spectrum.** |
| **Document Type** | Report |
| **Group/Chair** | SWG Spectrum Sharing/Mr. Alex Orange |
| **Editor(s)** |  |
| **Scope** | Provide up-to-date information on techniques, measures, mechanisms and their efficacy to improve coexistence of 4G-LTE and 5G-NR systems operating in the 3400 - 3600 MHz band with other systems operating in adjacent spectrum. |
| **Purpose** | Provide APT member countries with practical information on improving coexistence of 4G-LTE and5G-NR systems operating in the 3400 - 3600 MHz band with other systems operating in adjacent spectrum to maximize the utility and value of the radio spectrum, and accommodate new and incumbent usage |
| **Related Document** |  |
| **Related Forums** | ITU-R SG5 WP 5D, SG4 WP4A, 3GPP |
| **Timelines** | **The 24th meeting (Bangkok) in September 2018**  🡪 create, and approve the work plan  🡪 develop preliminary content for working document towards a Preliminary Draft New Report  **The 25th meeting (T.B.D.) in [June] 2019**  🡪 Review input documents to meeting  🡪 Create initial working document toward a Preliminary Draft New Report  **The 26th meeting (T.B.D.) in [April] 2020**  🡪 Review input documents to meeting  🡪 Update the working document toward a Preliminary Draft New Report with input contributions  **The 27th meeting (T.B.D.) in [September] 2020**  🡪 Review input documents to meeting  🡪 Update the working document toward a Preliminary Draft New Report  🡪 Approve working document as Preliminary Draft New Report  **The 28th meeting (T.B.D.) in [April] 2021**  🡪 Approve PDNR as Draft New Report |

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| **Title** | **Study on Technical and Operational Measures for Coexistence between Terrestrial and Satellite IMT Systems Deployed in 1 980-2 010 MHz/2 170-2 200 MHz in the Asia-Pacific Region** |
| **Document Type** | Report |
| **Group/Chair** | WG-SPEC/SWG SS |
| **Editor(s)** | Mr. Liu Quan (China) and Mr Nguyen Anh Tuan (Viet Nam) |
| **Scope** | 1. Analyze the status quo and plans of IMT deployment in the bands of 1980-2010 MHz and 2170-2200 MHz in APT member countries. 2. Review and analyze the related study results of ITU-R regarding the coexistence and compatibility for the deployment of satellite and terrestrial components of IMT in the bands of 1980-2010 MHz and 2170-2200 MHz. 3. Considering the specific requirements in APT region, further study on feasible technical and operational measures for effectively mitigating the potential interference between the satellite and terrestrial IMT systems in the bands of 1980-2010 MHz and 2170-2200 MHz. |
| **Purpose** | 1. Facilitate the development and co-existence of both satellite and terrestrial components of IMT in the bands of 1980-2010 MHz and 2170-2200 MHz in the Asia-Pacific region. 2. Provide information for the coordination between related countries. |
| **Related Document** | Resolution 212 (Rev.WRC-15)  Recommendation ITU-R M.1036-5  Related text of the CPM report for WRC-19  APT Report-46 Rev.2 |
| **Related Organization** | ITU-R, AWG |
| **Timelines** | **2018**  AWG-24:   * + Initial of the work.   + Discuss the scope of the work.   + Develop work plan and timeline.   **2019**  AWG-25:   * + Develop the working document based on the contributions and meeting discussion.   + Review and analyse the results of the sharing studies in ITU-R.   + Update the work plan and timeline, as appropriate.   **2020**  AWG-26:   * + Consider the contributions, and update the working document.   + Update the work plan and timeline, as appropriate.   AWG-27:   * + Finalize the study work, if possible. |

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| **Title** | **Sharing and compatibility studies for IMT above 24 GHz for APT region** |
| **Document Type** | Report and liaison statement to APG / relevant ITU-R groups as appropriate |
| **Group/Chair** | WG-SPEC/Sub-WG Sharing Studies/Mr. Jungsoo Woo |
| **Editor(s)** | TBD |
| **Scope** | 1. To survey existing services or applications operating on a primary basis in APT region in the frequency ranges listed in Resolution 238 [COM6/20] (WRC-15) 2. To review the relevant parameters of TG5/1 for the existing service/applications surveyed in APT region 3. To review and analyze the results of the sharing studies of TG5/1 based on the existing service/applications surveyed in APT region 4. To deliver study results to APG, as appropriate 5. To develop APT Report in accordance with relevant study results |
| **Purpose** | Provide APT member countries with regionally adapted studies for implementing IMT above 24GHz |
| **Related Document** | ITU-R Administrative circular CA/226 (related to WRC-19 agenda item 1.13) |
| **Related organizations** | ITU-R, 3GPP, CEPT ECC and other relevant regional study groups |
| **Timelines** | **AWG-19 (2016-2)**   * Adopt the work plan * Invite contributions to describe implementations of existing services/applications in the frequency ranges listed in Resolution 238 [COM6/20] (WRC-15)   **AWG-20 (2016-Sep.)**   * Consider input contributions describing implementations of existing services/applications in the frequency range listed in Resolution 238 [COM6/20] (WRC-15) * Discuss RF characteristics and relevant propagation models as required to support sharing studies for IMT above 24 GHz and existing services based on input contributions * Invite the sharing study in the frequency ranges listed in Resolution 238 [COM6/20] (WRC-15) * Develop a working document towards a preliminary draft new Report   **AWG-21 (2017-Apr.)**   * Provide technical characteristics for sharing studies based on input contributions * Provide propagation models for sharing studies based on input contributions * Discuss sharing studies based on input contributions * Submit study results to APG and relevant ITU-R groups as appropriate * Update the working document towards a preliminary draft new Report |
|  | **AWG-22 (2017-3Q)**   * Discuss the received contributions * Submit study results to APG and relevant ITU-R groups as appropriate * Update the working document towards a preliminary draft new Report   **AWG-23 (2018-1Q)**   * Discuss the received contributions * Submit study results to APG and relevant ITU-R groups as appropriate * Update the working document towards a preliminary draft new Report   **AWG-24 (2018-3Q)**   * Discuss the received contributions * Inform the study progress to APG and relevant ITU-R groups as appropriate * Update the working document towards a preliminary draft new Report   **AWG-25 (2019,2Q)**   * Discuss the received contributions * Finalise the draft new Report and approve it |

**Sub-WG and TGs of Working Groups Technology Aspects**

**Sub-Working Group on IMT:**

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| **Title** | **Survey of Usage and Future Plan of Frequency Bands in relation to Studies on WRC-19 Agenda Item 1.13 in Asia-Pacific Region** |
| Document Type | APT Report, Liaison statement to APG |
| Group/Chair | WG-TECH/Sub-WG IMT, Mr. Yasuhiro KATO (Japan) |
| Editor(s) | Ms. Boya Lyu (CHN) |
| Scope | To facilitate the study in relation to WRC-19 Agenda item 1.13 in APG, AWG-19 developed a questionnaire to collect information on usage and future plan as well as other relevant information for the frequencies to be studied for IMT under Resolution 238 (WRC-15) in Asia-Pacific Region. |
| Purpose | To collect information on usage and future plan as well as other relevant information for the frequencies to be studied for IMT under Resolution 238 (WRC-15) in Asia-Pacific Region,  To develop an APT/AWG Report by compiling the responses from APT members, and sent it to APG 19-2. |
| Related Document | Resolution 238 (WRC-15) |
| Related Organization | ITU-R |
| Timelines | **AWG-19 (2016 Feb.)**   * Develop work plan and timeline. * Prepare and issue a questionnaire to seek information from APT members. * Inform the initiation of this study to APG 19-1. * Invite APT members to provide their initial responses to the questionnaire until AWG-20.   **AWG-20 (2016 September)**   * Review the initial responses from APT members and corresponding input contributions. * Review needs for further information. * Draft a working document towards an APT/AWG Report to summarize the responses to the questionnaire based on the contributions from APT members and the meeting discussion.   **AWG-21 (2017 April)**   * Review the further responses from APT members and corresponding input contributions. * Update the working document. * Provide progress of the studies to APG 19-2. * Recirculate the questionnaire and invite APT members to provide their further responses until AWG-23.   **AWG-22 (2017 September**)   * Review the further responses from APT members and corresponding input contributions. * Update the working document. * Provide progress of the studies to APG 19-3.   **AWG-23 (2018 April)**   * Review the further responses from APT members and corresponding input contributions. * Update the working document.   **AWG-24 (2018 September)**   * Review the further responses from APT members and corresponding input contributions. * Update the working document and finalize it as an APT/AWG Report. * Provide the final report to APG 19-4.   **AWG-25 (2019 June)**   * Review the further responses from APT members and corresponding input contributions. * Update the working document and finalize it as an APT/AWG Report. * Provide the final report to APG 19-5. |

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| **Title** | **Implementation of Public Safety LTE (PS-LTE) Networks** |
| **Document Type** | APT/AWG Report |
| **Group/Chair** | WG-Service and Applications / TG-PPDR, Mr. Bharat Bhatia and  WG-Technology Aspects / Sub-WG IMT, Mr. Yasuhiro KATO (Japan) |
| **Editor(s)** | TBD |
| **Scope** | This study summarizes present status of international standardization of PS-LTE technologies by 3GPP and relevant implementation activities in some countries in the world including the Asia-Pacific Region. It also summarizes technical subjects that are important for implementation of PS-LTE networks. |
| **Purpose** | * To share the relevant information from some countries with the APT Members wishing to consider implementation of PS-LTE technologies in their countries. |
| **Related Document** | TBD |
| **Related Forums and Organization** | 3GPP, ITU-R WP 5D, WP 5A |
| **Timelines** | **2016**  AWG-19 (February)   * Consider relevant input documents * Develop a detailed work plan   AWG-20 (September)   * Consider relevant input documents * Review and update the detailed work plan   **2017**  AWG-21 (April)   * Consider relevant input documents * Consider to develop a working document, if necessary * Review and update the detailed work plan, if necessary   AWG-22 (September)   * Consider relevant input documents * Review and update the working document and the detailed work plan, if necessary   **2018**  AWG-23 (1Q)  No input contribution received at AWG-23  AWG-24 (3Q)   * Consider relevant input documents * Review and update the working document and the detailed work plan, if necessary   AWG-25 (2019)   * Consider relevant input documents * Review and update the working document and the detailed work plan, if necessary * Finalize the Report and send for approval |

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| **Title** | **Report(s) on necessary technical conditions to support technology neutrality and spectrum efficiency for implementation of IMT networks in bands identified for IMT** |
| **Document Type** | APT/AWG Report(s) |
| **Group/Chair** | WG-Technology Aspects / Sub-WG IMT, Mr. Yasuhiro KATO (Japan) |
| **Editor(s)** | Nguyen Thu Ha (VTN) |
| **Scope** | To support and assist APT Members in using the radio frequency spectrum and deploying radio networks effectively, it needs studies on establishing the minimum recommended technical conditions to be applied for implementation of IMT networks that could help APT Members on regulating the neutrality and spectrum efficiency of bands identified for IMT: |
| **Purpose** | * To collect information on regulatory for implementation of IMT networks in the frequency bands identified for IMT in Asia-Pacific Region * To develop an APT/AWG survey Report by compiling the responses from APT Members * To develop an APT/AWG technical Report to provide the minimum recommended technical conditions (frequency ranges, power limits, spectrum masks…) to be applied for implementation of IMT networks in the frequency bands identified for IMT to support technology neutrality and spectrum efficiency |
| **Related Document** | **APT/AWG/REP-15**: Information of Mobile Operator’s Frequencies, Technologies and License Durations in Asia Pacific Countries |
| **Related Forums and Organization** | ITU-R WP 5D, 3GPP |
| **Timelines** | **2017**  AWG-22   * Initiate work item. * Prepare and issue a questionnaire to seek information from APT Members. * Invite APT members to provide their initial responses to the questionnaire until AWG-24. * Develop a detailed work plan and timeline.   **2018**  AWG-23   * Review the initial responses from APT Members and corresponding input contributions. * Draft the working document towards an APT/AWG survey Report to summarize the responses to the questionnaire based on the contributions from APT meMmbers and the meeting discussion. * Consider to develop the working document towards an APT/AWG technical Report as appropriate. * Update the detailed work plan.   AWG-24   * Consider relevant input documents. * Finalize the working document as an APT/AWG survey Report. * Continue to develop the working document towards an APT/AWG technical Report as appropriate. * Update the detailed work plan.   **2019**  AWG-25   * Consider relevant input documents. * Finalize the working document as an APT/AWG technical Report. |

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| **Title** | **Current status and future plan of implementation and deployment of IMT-2020 (5G) in Asia-Pacific region** |
| Document Type | APT/AWG Report |
| Group/Chair | WG-TECH/Sub-WG IMT, Mr. Yasuhiro KATO (Japan) |
| Editor(s) | Mr. Meng Xi (CHN) |
| Scope | To collect information on the current status and future plan of IMT-2020 (5G) in APT countries and on industry activities |
| Purpose | To facilitate study on 5G in Asia-Pacific region |
| Related Document | TBD |
| Related Organization | ITU-R |
| Timelines | **AWG-23 (April, 2018)**   * Develop work plan and timeline, * Prepare and issue a questionnaire to seek information from APT Members.   **AWG-24 (September, 2018)**   * Consider the responses from APT Members, * Consider input contributions, * Develop a working document towards an APT/AWG Report to summarize the responses to the questionnaire.   **AWG-25 (2019)**   * Consider input contributions, * Update the working document and finalize it as an APT/AWG Report. |

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| **Title** | **Studies on implementation aspects of IMT-2020 in the frequency bands below 6 GHz in Asia-Pacific region** |
| Document Type | APT/AWG Report |
| Group/Chair | WG-TECH/Sub-WG IMT, Mr. Yasuhiro KATO (Japan) |
| Editor(s) | TBD |
| Scope | To study implementation aspects of IMT-2020 in the frequency bands below 6 GHz in the Asia-Pacific region. The studies include investigations on:   * on-going industry developments, * migration of networks from IMT-2000/IMT-Advanced to IMT-2020, * technical conditions to be applied for Active Antenna Systems (AAS) for IMT-2020 and for evolution of IMT-Advanced networks |
| Purpose | To provide APT Members with information relevant to implementation aspects of IMT-2020 in the frequency bands below 6 GHz in their countries. |
| Related Document | TBD |
| Related Organization | 3GPP, ITU-R |
| Timelines | **2018**  AWG-24 (September)   * + Develop a work plan and timeline,   + Develop a skeleton of the working document,   **2019**  AWG-25 (June)   * + Consider received contributions,   + Update the working document,   **2020**  AWG-26   * + Consider received contributions,   + Update the working document and finalize it as an APT/AWG Report. |

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| **Title** | **Studies on 5G implementation in frequency bands above 24.25 GHz** |
| Document Type | APT/AWG Report |
| Group/Chair | WG-TECH/Sub-WG IMT, Mr. Yasuhiro KATO (Japan) |
| Editor(s) | TBD |
| Scope | To study current or intended implementation of 5G in the frequency bands above 24.25 GHz. The studies include investigations on:   * global trends, * on-going specification developments by 3GPP (currently, in the 24.25-27.5 GHz, 26.5-29.5 GHz, 37-40 GHz, and [40.5]-42.5 GHz bands), * on-going industry developments, * case studies in those countries that have implemented or plan to implement 5G. |
| Purpose | To provide APT Members with relevant information on 5G mentioned in the scope. |
| Related Document | TBD |
| Related Organization | 3GPP, ITU-R |
| Timelines | **2018**  AWG-24 (September)   * + Consider received contributions,   + Develop a work plan and timeline,   **2019**  AWG-25 (June)   * + Consider received contributions,   + Develop a working document,   **2020**  AWG-26   * + Consider received contributions,   + Update the working document and finalize it as an APT/AWG Report. |

**TG FWS:**

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| **Title** | **Models for FWS link performance degradation due to wind** |
| **Document Type** | APT Recommendation or report |
| **Group/Chair** | TG FWS/Dr. Tetsuya Kawanishi |
| **Editor(s)** | Mr. Eisaku Sasaki and Mr. Meng Xi, |
| **Scope** | Draft and complete the APT Recommendation/Report on models for FWS link performance degradation due to wind |
| **Purpose** | Study and identify the models for FWS link performance degradation |
| **Related Document** | [Draft new APT report on FWS Link Performance under severe weather conditions] |
| **Related Forums and Organization** | ITU-R SG3 WP 3J, WP 3K and WP 3M, and SG5 WP 5C |
| **Timelines** | 2018   * AWG-23:   + Development of the Work Plan at TG-FWS   + Development of the working document to establish the basic structure of the Recommendation or Report * AWG-24:   + Development of the preliminary draft new Recommendation/Report to organize the technical basis etc.   2019   * AWG-25   + Continue development of the preliminary draft new Recommendation/Report   2020   * AWG-26   + Continue development of the preliminary draft new Recommendation/Report * AWG-27   + Finish development of the preliminary draft new Recommendation/Report and upgrade it to draft new Recommendation/Report. |

**TG ITS:**

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| **Title** | Cellular based V2X for ITS applications in APT countries |
| **Document Type** | Report |
| **Group/Chair** | TG ITS/ Mr. Satoshi (Sam) Oyama, Japan |
| **Editor(s)** | [Mr. Andy Phang, Singapore/ Mr. Michael Park, Korea] |
| **Scope** | Provide up-date information on Cellular based V2X technologies, spectrum, and others in APT member countries. |
| **Purpose** | Provide APT member countries with practical information on the currently considered Cellular based V2X technologies, spectrum, and others with the purpose of reaching harmonization to the greatest extent. |
| **Related Document** | Usage of ITS in APT countries (Document# APT/AWG/REP-18 (Rev. 2)) |
| **Related Forums** | APG, ITU-R WP 5A |
| **Timelines** | **The 24th meeting (Bangkok) in September 2018**   * + create a work plan   + create preliminary contents for the Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 25th meeting (T.B.D.) in [April] 2019**   * + create initial working document toward a Preliminary Draft New Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 26th meeting (T.B.D.) in [April] 2020**   * + modify the working document toward a Preliminary Draft New Report with input contributions   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 27th meeting (T.B.D.) in [September] 2020**   * + modify the working document toward a Preliminary Draft New Report with input contributions   + obtain approval as Preliminary Draft New Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 28th meeting (T.B.D.) in [April] 2021**   * + finalize and obtain approval on the Draft New Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary |

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| **Title** | **Millimetre wave ITS applications in APT countries** |
| **Document Type** | Report |
| **Group/Chair** | TG ITS/ Mr. Satoshi (Sam) Oyama, Japan |
| **Editor(s)** | Dr. Kazuaki Takahashi, Panasonic, Japan |
| **Scope** | Provide up-date information on the currently considered ITS technologies, spectrum, status of Millimetre wave communication services and sensors in APT member countries. |
| **Purpose** | Provide APT member countries with practical information on the currently considered millimetre wave ITS technologies, spectrum, status of commercialization service and others with the purpose of reaching harmonization to the greatest extent |
| **Related Document** | Usage of ITS in APT countries (Document# APT/AWG/REP-18 (Rev. 2)) |
| **Related Forums** | APG, ITU-R WP 5A |
| **Timelines** | **The 24th meeting (Bangkok) in September 2018**   * + create a work plan   + create preliminary contents of the Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 25th meeting (T.B.D.) in [April] 2019**   * + create initial working document toward a Preliminary Draft New Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 26th meeting (T.B.D.) in [April] 2020**   * + modify the working document toward a Preliminary Draft New Report with input contributions   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 27th meeting (T.B.D.) in [September] 2020**   * + modify the working document toward a Preliminary Draft New Report with input contributions   + get approval as Preliminary Draft New Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary   **The 28th meeting (T.B.D.) in [April] 2021**   * + finalize and get approval on the Draft New Report   + send liaison statement to ITU-R WP 5A and/or related organisations, if necessary |

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| **Title** | **Vehicle Mounted Earth Stations (VMES) in Ku-Band GSO FSS Networks** |
| **Document Type** | Report |
| **Group/Chair** | TG ITS/ Mr. Satoshi (Sam) Oyama, Japan |
| **Editor(s)** | Dr Bob Horton, Australia |
| **Scope** | Evaluate relevance to APT Region; Analyse studies and compatibility of VMES with existing services within the APT Region. |
| **Purpose** | Enhance the understanding and application of VMES in the APT Region. |
| **Related Documents**  (ITU/APT) | ITU-R.1857, ETSI EN 302 977, EN 303 978, USA (FCC) §25.226 |
| **Related Organization** | Intelsat |
| **Timelines** | **The 24th meeting (Bangkok) in September 2018**   * + create a work plan   + create questionnaire to survey the potential of VMES within APT countries   **The 25th meeting (T.B.D) in [April] 2019**   * + evaluate studies and compatibility of VMES with other services in Ku-band   **The 26th meeting (T.B.D.) in [April] 2020**   * + finalise Report |

**TG IoT:**

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| **Title** | **LPWAN for IoT based on non-cellular technologies** |
| **Document Type** | Report |
| **Group/Chair** | WG-TECH/TG-IoT |
| **Editor(s)** | Mr. Nguyen Anh Tuan (Vietnam) |
| **Scope** | * To provide information on technical characteristics, standards and frequency bands for LPWAN IoT. * To study on technical and operational aspects such as  1. Technical requirements and field tests for the LPWAN IoT. 2. operational issues encountered in LPWAN IoT deployment and its solutions (if any).  * To study the potential harmonization opportunities on the frequency range and technical specification for the deployment of LPWAN IoT. |
| **Purpose** | To support Administrations in the implementation of non-cellular LPWAN IoT service in the unlicensed or/and licensed spectrum. |
| **Related Document** | * RESOLUTION 958 (WRC-15) "Urgent studies required in preparation for the 2019 World Radiocommunication Conference". * ITU-R SM.2423 on “Technical and operational aspects of low-power wide-area networks for machine-type communication and the Internet of Things in frequency ranges harmonised for SRD operation”. * APT/AWG/REP-35 (Rev.1) “APT Report on “Frequency bands for harmonized use of SRDs”. * APT/AWG-24/TMP “APT Survey Report on Current Status and Future Plan of Implementation and Development of Internet of Things in Asia Pacific Countries”. |
| **Related Organization** | APT |
| **Timelines** | **2018**  AWG-24:   * + Initiate the workplan   + Discuss and develop the working document structure towards new APT report on LPWAN IoT using non-cellular technologies   + Discuss the work plan and timeline   + Call for contributions   **2019** AWG-25:   * + Consider the received contributions   + Develop a working document for new draft report based on received contributions   **2020**  AWG-26:   * + Consider the received contributions   + Finalise the Recommendation/report of APT/AWG |

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| **Title** | **Technology and spectrum management technics for IoT networks** |
| **Document Type** | APT Report |
| **Group/Chair**  **Co-chair** | WG-TECH/TG-IoT / Dr. Satoshi TSUKAMOTO (Japan)  Mr. M.M. ASKARI (IRAN (Islamic Republic of.)) |
| **Editor(s)** | Hakan PERSSON ( Ericsson ) |
| **Scope** | To develop a report on technology and solutions required enabling spectrum access to IoT networks, including current situation and potential applicability of current mechanisms such as licensed shared access (LSA) for national spectrum management within the Asia Pacific region. Some application domains envisaged for such networks are typically deployed by industries, e.g. Creative- and Culture Industries, Factory and Process Automation, eHealth, PPDR stipulating demanding QoS requirements (availability, reliability and latency) for wireless communication. This report will support the development of Industry 4.0 in APT Member countries. |
| **Purpose** | To provide to APT administrations, operators, verticals and vendors relevant information on different technology and spectrum management techniques for facilitating the access to spectrum for IoT networks. A current view of developments in other regions will be provided. |
| **Related Document** | Draft APT XX report “Current Status and Future Plan of Implementation and Deployment of IoT in APT Countries”  APT Report 68 on "Authorized/Licensed Shared Access as a National Solution to Access Spectrum for IMT” |
| **Related Forums and Organisation** | ITU-R, APT, ETSI, 3GPP |
| **Timelines** | **The -24th meeting (Bangkok, Thailand) in Sept.2018**   * + Initiate the task in AWG   + Develop and agree the workplan and timeline   + Prepare, discuss and agree draft report structure   **The 25th meeting, 2019**   * + Collect and review input contributions   + Further develop and update the working document towards a draft new report based on input contributions and related documents   + Invite further contributions   **The 26th meeting, 2020**   * + Collect and review input contributions   + Further develop and update working document towards a draft new report based on input contributions and related documents   + Consider a first draft of an APT Recommendation on this subject   + Finalize the draft APT Report for approval |

**TG WPT:**

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| **Title** | **Radio Frequency Beam WPT** |
| **Document Type** | APT/AWG Report |
| **Group/Chair** | WG on Technology /TG WPT/ Chan Hyung CHUNG, (Korea) |
| **Editor(s)** | Mr. NGUYEN ANH TUAN(Vietnam) |
| **Scope** | To draft and complete the APT Report on frequency ranges used for Radio Frequency Beam WPT technologies for electric devices.  To study possible frequency ranges described in the APT Report on WPT and the latest WPT studies in ITU-R. |
| **Purpose** | Study frequency ranges and Service applications used for Radio Frequency Beam WPT technologies  Not to cause harmful interference to radiocommunication services;   1. To facilitate smooth deployment of Radio Frequency Beam WPT systems without spectrum concerns; 2. To collect information on spectrum requirements and related matters of Radio Frequency Beam WPT; |
| **Related Document** | 1. APT Survey Report on WPT 2. APT Report on WPT 3. ITU-R Question ITU-R 210-3/1 4. Recommendation ITU-R SM.2303-2 Wireless power transmission using technologies other than radio frequency beam 5. Recommendation ITU-R SM.2110-0 Frequency ranges for operation of non-beam Wireless Power Transmission (WPT) systems 6. Recommendation ITU-R SM.2392-0 Applications of wireless power transmission via radio frequency beam |
| **Related Forums and Organization** | APG, ITU-R SG1, WP 1A, and WP 1B |
| **Timelines** | **2018 April (AWG-23)**   * Approval of the Work Plan * Initiation of new report for Radio Frequency Beam WPT   **2018 September (AWG-24)**   * Prepare Drafting the New Working Document (WD)   **2019 February (AWG-25)**   * Studies on spectrum sharing and impact of WPT to existing radiocommunication services and etc. * Review and update PDNR   **2019 September (AWG-26)**   * Studies on spectrum sharing and impact of WPT to existing radiocommunication services and etc. * Approval of PDNR for an AWG output for Report |

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| **Title** | **Impact study for Non-Beam WPT for Mobile Devices** |
| **Document Type** | APT/AWG Report |
| **Group/Chair** | WG-TECH/TG WPT/Mr. Chan Hyung Chung |
| **Co-Editor(s)** | Mr. Song Qiaojian(Apple South Asia Pte Ltd), Mr. Se Ho Park(Samsung) |
| Scope | Prepare impact study report for Non-Beam WPT for Mobile Devices |
| **Purpose** | Impact study for non-beam WPT technologies for mobile devices:   1. Not to cause harmful interference to incumbent radiocommunication services; 2. To facilitate smooth deployment of WPT systems without spectrum concerns; |
| **Related Document** | 1. Ongoing APT New Survey Report for 100 to 300kHz non-ISM band for Non-Beam WPT 2. APT Report on WPT (APT/AWG/REP-62(Rev.1)) 3. Report ITU-R SM.2303-2“Wireless power transmission using technologies other than radio frequency beam” |
| **Related Forums and Organization** | ITU-R SG1, WP 1A, and WP 1B |
| **Timelines** | **2018**   * AWG-23   + Initiate the task in AWG   + Develop a work plan   + Develop the incumbent victim system parameters list * AWG-24   + Review specific parameters necessary for impact studies with APT members contribution and existing standards   + Develop a draft impact study report for non-beam WPT for mobile device based on contributions and meeting discussion   **2019**   * AWG-25   + Finalize the impact study report |

**TG HAPS:**

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| **Title** | **Technical and operational analysis for using HAPS as IMT base station in the frequency bands around and below 2GHz identified to IMT** |
| **Document Type** | APT Report |
| **Group/Chair** | Dr. LANG BAOZHEN |
| **Editor(s)** |  |
| **Scope** | This report is to provide technical and operational analysis information as required by APG-19. |
| **Purpose** | To provide technical information and operational analysis on using HAPS as IMT base stations and assist APG to consider on possible new agenda item of WRC-23 |
| **Related Document** |  |
| **Related Organization** | APG19 |
| **Timelines** | **The 23 rd meeting (Da Nang City， Viet Nam) in April 2018**   * Develop the draft work plan * Initiate the development of the Report   **The 24th meeting in September 2018**   * Further develop the Report based on the input contributions and Reponses to questionnaire. * Liaison to APG19-4 to inform the study progress.   **The 25 th meeting (TBD) in 2019**   * Finalize the report if possible. * Liaison to APG19-5 to inform the report. * Consider the future work plan. |

**TGs of Working Group Service & Applications**

**Task Group on Modern Satellite Applications (TG-MSA)**

Currently no work item under TG MSA.

**Task Group on Aeronautical and Maritime (TG-A&M)**

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| **Title** | **Current and future usage of unmanned aircraft** |
| **Document Type** | APT Report |
| **Group/Chair** | TG-Aeronautical and Maritime |
| **Editor(s)** | Chairman TG-Aeronautical and Maritime, Ms. Takako KITAHARA |
| **Scope** | Provide information on various potential services and applications, and success factors to deliver services and applications for public use of unmanned aircraft, disaster relief case studies and future challenges |
| **Purpose** | To identify the future needs of special communications for social, industrial and economic development which could be satisfied by services and applications on unmanned aircraft systems. |
| **Related Document** | NONE |
| **Related Forums** | ITU WP 5B |
| **Timelines** | **2015:**  AWG-18 🡪Initial revision of Terms of Reference  **2016:**  AWG-19 🡪Review input contributions and initiate studies on the topic of service and application for public use of unmanned aircraft, and review ToRAWG-20🡪 Initiate report based on the results of studies.  **2017:**  AWG-21🡪 Continue development of report, development and circulation of survey questionnaire on current spectrum usage and future plan of unmanned aircraft system  AWG-22🡪 Compilation of questionnaire responses, continue development of report  **2018:**  AWG-23🡪 Compilation of questionnaire responses, continue development of report.  AWG-24🡪 Continue development of report.  **2019:**  AWG-25🡪 Finalize the report. |

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| **Title** | **Broadband Wireless Air-to-Ground Communications Links with Passenger Aircraft** |
| **Document Type** | APT |
| **Group/Chair** | TG-Aeronautical and Maritime / Dr. YING XU |
| **Editor(s)** | Chairman TG-Aeronautical and Maritime, Mr. Stewart Wallace |
| **Scope** | Develop a new Report on the Technical Characteristics, Operating Provisions and Regulatory Provisions on the broadband Wireless Air-to-Ground Communications Links with Passenger Aircraft |
| **Purpose** | AWG consider developing harmonized arrangements for technical characteristics, operating provisions and regulatory provisions for air-to-ground mobile broadband links to passenger aircraft, to enable seamless passenger flight operations across the entire region, and aligned with similar developments already occurring in other regions. |
| **Related Document** | ITU-R. Report M.2282. |
| **Timelines** | 2017:  AWG-21: Initiate the development of new AWG Report  AWG-22: Continue development of draft new AWG Report  2018:  AWG-23 : Continue development of draft new AWG Report  AWG-24 : Continue development of report.  **2019:**  AWG-25: Finalize the report. |

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| **Title** | **Implementation of the bands 108 – 117.975 MHz, 328.6-335.4 MHz and 960-1164 MHz for the aeronautical radionavigation systems in APT region** |
| **Document Type** | Report |
| **Group/Chair** | TG-Aeronautical and Maritime / Dr. YING XU |
| **Editor(s)** | Chairman TG-Aeronautical and Maritime, Mr. Bui Ha Long (VTN) |
| **Scope** | To support and assist APT Members in using the mentioned radio frequency spectrum and deploying aeronautical radionavigation systems in these bands effectively |
| **Purpose** | To recognize the commonly used of these spectrum in order to facilitate the efficient usage, border coordination on these frequencies among APT countries. |
| **Related Document** | NONE |
| **Timelines** | 2017:  AWG-22: Initiate the development of AWG Report  2018:  AWG-23: Continue development of the draft new AWG Report  AWG-24: Continue development of the draft new AWG Report  2019:  AWG-25: Continue development of the draft new AWG Report  2020:  AWG-26: Completion of draft new AWG Report |

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| **Title** | **[UHF-MAR]** **Study of usage of the bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz by the maritime mobile service in Asia Pacific region** |
| Document Type | Report |
| Group/Chair | TG-Aeronautical and Maritime / Dr. YING XU |
| Editor(s) | Chairman TG-Aeronautical and Maritime, Bui Ha Long (VTN) |
| Scope | To develop APT Report on guideline for the use of the bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz for UHF on-board vessel communication in Asia Pacific region. |
| Purpose | To support the wide usage of UHF on-board vessel communication in the bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz in Asia-Pacific region. |
| Related Document | NONE |
| Timelines | 2018:  AWG-23: Discuss the scope of the draft new AWG Report/guideline  AWG-24: Further discuss the scope and the structure of the working document  2019:  AWG-25: Continue development of the draft new AWG Report/guideline  2020:  AWG-26: Continue development of the draft new AWG Report/guideline  AWG-27: Completion of draft new APT Report |

**Task Group on PPDR (Jointly with Sub-WG IMT)**

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| **Title** | **Implementation of Public Safety LTE (PS-LTE) networks** |
| **Document Type** | APT/AWG Report |
| **Group/Chair** | WG-Service and Applications / TG-PPDR, Mr. Bharat Bhatia and  WG-Technology Aspects / Sub-WG IMT, Mr. Yasuhiro KATO (Japan) |
| **Editor(s)** | TBD |
| **Scope** | This study summarizes present status of international standardization of PS-LTE technologies by 3GPP and relevant implementation activities in some countries in the world including the Asia-Pacific Region. It also summarizes technical subjects that are important for implementation of PS-LTE networks. |
| **Purpose** | * To share the relevant information from some countries with the APT Members wishing to consider implementation of PS-LTE technologies in their countries. |
| **Related Document** | TBD |
| **Related Forums and Organization** | 3GPP, ITU-R WP 5D, WP 5A |
| **Timelines** | **2016**  AWG-19 (February)   * Consider relevant input documents * Develop a detailed work plan   AWG-20 (September)   * Consider relevant input documents * Review and update the detailed work plan   **2017**  AWG-21 (April)   * Consider relevant input documents * Consider to develop a working document, if necessary * Review and update the detailed work plan, if necessary   AWG-22 (September)   * Consider relevant input documents * Review and update the working document and the detailed work plan, if necessary |
|  | **2018**  AWG-23 (2018)   * No input contribution received at AWG-23   AWG-24 (2018)   * Consider relevant input documents * Review and update the working document and the detailed work plan, if necessary   AWG-25 (2019)   * Consider relevant input documents * Review and update the working document and the detailed work plan, if necessary * Finalize the Report and send for approval |

**Task Group on Railway Radiocommunication**

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| **Title** | **System deployment and relevant testing studies of Railway Radiocommunication System between Train and Trackside (RSTT) in APT countries** |
| **Document Type** | APT Report |
| **Group/Chair** | TG on Railway/ Mr. Bin LIU, CHN |
| **Editor(s)** | Mr. BO JIANG (China) and Mr. KAZUKI NAKAMURA(Japan) |
| **Scope** | 1. to share experiences of deployment of railway radiocommunication systems,  2. to share field testing studies related to deployment of RSTT and studies on radio propagation characteristics under high speed movement in typical scenarios. |
| **Purpose** | To provide administrations and railway operators in Asia-Pacific region with relevant information on experiences and supplemental studies of RSTT deployment. |
| **Related Document** | Working document towards preliminary draft APT Report on [Systems descriptions technologies and implementation of] Railway Radiocommunication System between Train and Trackside (RSTT) |
| **Related Forums** | **ITU-R WP5A** |
| **Timelines** | **The 21th meeting of AWG in 2017**  🡪 to start the study by conducting the working plan.  **The 22nd meeting of WG in 2017**  🡪 to develop the document based on the input contributions.  **The 23rd meeting of AWG in 2018**  🡪 to improve the Report.  **The 24th meeting of AWG in 2018**  🡪 to finalize the Report (if possible).  **The 25th meeting in 2019**  🡪if not finalized in AWG24, then finalize this the Report in AWG 25. |

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| **Title** | **Railway radiocommunication system for passengers’ access to information and Internet services** |
| **Document Type** | APT Report |
| **Group/Chair** | TG Railway/ Mr. Bin LIU, CHINA |
| **Editor(s)** | Hokyom KIM (ETRI, Republic of Korea) |
| **Scope** | To study railway radiocommunication systems to enable passengers access to information and Internet services other than RSTT |
| **Purpose** | To share information on national implementation experiences of railway radiocommunication system to enable passengers access to information and Internet services other than RSTT in Asia-Pacific Region. |
| **Related Document** |  |
| **Related Forums** |  |
| **Timelines** | **The 21th meeting (Bangkok) in April 2017**  🡪to start the study by conducting the workplan  **The 22nd meeting in 2017**  🡪to collect information on railway radiocommunication system to enable passengers access to information and Internet services and to discuss the structure and contents of the Report according to contributions from APT Member countries  **The 23rd meeting in 2018**  🡪to improve the Report.  **The 24th meeting in 2018**  🡪to improve the Report.  **The 25th meeting in 2019**  🡪to finalize the Report (if possible). |

**6. SUMMARY WORKPLAN STATUS**

| **No.** | **Work Item** | **Responsible Group** | **Expected Deliverable** | **Completion Target** |
| --- | --- | --- | --- | --- |
| 1 | Studies on frequency arrangements in the band 1427-1518 MHz | Sub-WG SA&H | Report | AWG-25 |
| 2 | Harmonized frequency arrangement in the band 3 300 – 3 400 MHz | Sub-WG SA&H | Report/  Recommendation | AWG-25 |
| 3 | Frequency arrangement in the band 4 800 – 4 990 MHz | Sub-WG SA&H | Report/  Recommendation | AWG-25 |
| 4 | Frequency ranges for non-beam WPT for mobile devices | Sub-WG SA&H | Recommendation | AWG-25 |
| 5 | Sharing and compatibility studies for selected frequency bands below 6GHz | Sub-WG Sharing | Report, Liaison Statements | AWG-25 |
| 6 | Sharing and compatibility studies for IMT above 24GHz | Sub-WG Sharing | Report, Liaison Statements | AWG-25 |
| 7 | Studies related to techniques and technical conditions for Licensed-Assisted Access (LAA) and 5G New Radio - Shared Spectrum (5G NR-SS) as national solutions for accessing shared spectrum | Sub-WG Sharing Studies | Report | AWG-26 |
| 8 | Spectrum monitoring techniques and methods under multi-path environment | Sub-WG SM | Report | AWG-26 |
| 9 | Report on mitigation measures to improve coexistence of 4G-LTE and 5G-NR operating in the 3400 - 3600 MHz band and other systems operating in adjacent spectrum | Sub-WG Sharing Studies | Report | AWG-28 |
| 10 | Study on Technical and Operational Measures for Coexistence between Terrestrial and Satellite IMT Systems Deployed in 1 980-2 010 MHz/2 170-2 200 MHz in the Asia-Pacific Region | Sub-WG Sharing Studies | Report | AWG-27 |
| 11 | Survey of usage and future plan of frequency bands in relation to studies on WRC-19 agenda item 1.13 in Asia-Pacific region | Sub-WG IMT | Report | AWG-25 |
| 12 | Implementation Public Safety LTE (PS-LTE) Networks | Sub-WG IMT (jointly with TG PPDR) | Report | AWG-25 |
| 13 | Necessary technical conditions to support technology neutrality and spectrum efficiency for implementation of IMT networks in bands identified for IMT | Sub-WG IMT | Report | AWG-25 |
| 14 | Current status and future plan of implementation and deployment of IMT-2020 (5G) in Asia-Pacific region | Sub-WG IMT | Report | AWG-25 |
| 15 | Studies on implementation aspects of IMT-2020 in the frequency bands below 6 GHz in Asia-Pacific region | Sub-WG IMT | Report | AWG-26 |
| 16 | Studies on 5G implementation in frequency bands above 24.25 GHz | Sub-WG IMT | Recommendation/Report | AWG-26 |
| 17 | Models for FWS link performance degradation due to wind | TG FWS | Report | AWG-27 |
| 18 | Cellular based V2X for ITS applications in APT countries | TG ITS | Report | AWG-28 |
| 19 | Millimetre wave ITS applications in APT countries | TG ITS | Report | AWG-28 |
| 20 | Vehicle Mounted Earth Stations (VMES) in Ku-Band GSO FSS Networks | TG ITS | Report | AWG-26 |
| 21 | LPWAN for IoT based on non-cellular technologies | TG IoT | Report | AWG-26 |
| 22 | Technology and spectrum management technics for IoT networks | TG IoT | Report | AWG-26 |
| 23 | Radio Frequency Beam WPT | TG WPT | Report | AWG-26 |
| 24 | Impact study for Non-Beam WPT for Mobile Devices | TG WPT | Report | AWG-25 |
| 25 | Technical and operational analysis for using HAPS as IMT base station in the frequency bands around and below 2GHz identified to IMT | TG HAPS | Report | AWG-25 |
| 26 | Current and future usage of unmanned aircraft | TG A&M | Report | AWG-25 |
| 27 | Broadband Wireless Air-to-Ground Communications Links with Passenger Aircraft | TG A&M | Report | AWG-25 |
| 28 | Implementation of the bands 108 – 117.975 MHz, 328.6-335.4 MHz and 960-1164 MHz for the aeronautical radionavigation systems in APT region | TG A&M | Report | AWG-26 |
| 29 | UHF-MAR] Study of usage of the bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz by the maritime mobile service in Asia Pacific region | TG A&M | Report | AWG-27 |
| 30 | Implementation of Public Safety LTE (PS-LTE) networks | Sub-WG IMT (jointly with TG PPDR) | Report | AWG-25 |
| 31 | System deployment and relevant testing studies of Railway Radiocommunication System between Train and Trackside (RSTT) in APT countries | TG RR | Report | AWG-25 |
| 32 | Railway Radiocommunication system for passengers’ access to information and Internet services | TG RR | Report | AWG-25 |