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| **World Radiocommunication Conference (WRC-15) Geneva, 2-27November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| **PLENARY MEETING** | **Addendum 24 to**  **Document xx-E** |
| **31 July 2015** |
| **Original: English** |
| Asia-Pacific Telecommunity Common Proposals | |
| PROPOSALS FOR THE WORK OF THE CONFERENCE | |
|  | |
| Agenda item 10 | |

**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,

**Introduction:**

Agenda item 10 requests WRC-15 to recommend to the Council items for inclusion in the agenda for the WRC-18/19, and to give its view on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences.

**Proposals:**

APT Members are of the view that the volume of the agenda of a WRC and the workload of the preparatory work needed to be kept at a manageable level and that issues that can be resolved under the standing agenda items of WRCs or through the regular activities of ITU-R should not be converted into separate agenda items of WRCs.

APT Members carefully examined the proposed new items for inclusion in the agenda of a future conference together with the preliminary agenda items for WRC-19 within Resolution **808 (WRC‑12)** and reached the following proposals on WRC-15 Agenda item 10.

**SUP ASP/xxA24/1**

RESOLUTION 806 (WRC‑07)

Preliminary agenda for the 2015 World Radiocommunication Conference

**SUP ASP/ xxA24/2**

RESOLUTION 807 (WRC‑12)

**Agenda for the 2015 World Radiocommunication Conference**

**SUP ASP/ xxA24/3**

RESOLUTION 808 (WRC‑12)

Preliminary agenda for the 2018 World Radiocommunication Conference

**ADD ASP/ xxA24/4**

draft RESOLUTION [asp/10/1/WRC-19\_AGENDA] (WRC‑15)

**Agenda for the 2019 World Radiocommunication Conference**

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and that a final agenda shall be established by the Council two years before the conference;

*b)* Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;

*c)* the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

recognizing

*a)* that WRC‑15 has identified a number of urgent issues requiring further examination by WRC‑19;

*b)* that, in preparing this agenda, some items proposed by administrations could not be included and have had to be deferred to future conference agendas,

resolves

to recommend to the Council that a world radiocommunication conference be held in 2019 for a maximum period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC‑15 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action in respect of the following items:

**ADD ASP/ xxA24/5**

1.1 to consider identification of frequency bands for IMT including possible additional allocations to the mobile service on a primary basis in accordance with Resolution **[ASP-B10- IMT\_ABOVE\_6GHz] (WRC-15) (Attachment 1)**;

**ADD ASP/ xxA24/6**

1.2 to consider the appropriate regulatory measures to identify the land mobile and fixed services operating in the frequency range 275-1 000 GHz in accordance with Resolution **[ASP-C10-MS&FS\_ABOVE\_275GHz] (WRC-15) (Attachment 2)**;

**ADD ASP/ xxA24/7**

1.3 to consider spectrum related matters and possible regulatory actions for Intelligent Transport Systems (ITS) applications, taking into account the results of ITU‑R studies, in accordance with Resolution **[ASP-D10-ITS] (WRC-15) (Attachment 3)**;

**ADD ASP/ xxA24/8**

1.4 to consider regulatory actions, including spectrum allocations, to support GMDSS modernization and implementation of e-navigation in accordance with Resolution **359 (Rev. WRC-15) (Attachment 4)**;

**ADD ASP/ xxA24/9**

1.5 to consider regulatory provisions to facilitate the introduction of GADSS in aeronautical services bands in accordance with Resolution **[ASP-E10-GADSS] (WRC-15) (Attachment 5)**;

**ADD ASP/ xxA24/10**

1.6 to consider possible frequency requirement and regulatory procedures for protecting the automatic identification system (AIS) and supporting novel devices using AIS technology, in accordance with Resolution **[ASP-F10-AIS] (WRC-15) (Attachment 6)**;

**ADD ASP/ xxA24/11**

1.7 to consider spectrum related matters and possible regulatory actions to support the next generation radiocommunication systems between train and tracksides, in accordance with Resolution **[ASP-G10-TRAIN] (WRC-15) (Attachment 7)**;

**ADD ASP/ xxA24/12**

1.8 to consider spectrum related matters and regulatory actions to support wireless power transmission (WPT)[[1]](#footnote-1) taking into account the results of ITU-R studies in accordance with Resolution **[ASP-H10-WPT] (WRC-15) (Attachment 8)**;

**ADD ASP/ xxA24/13**

2 to examine the revised ITU‑R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC‑03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC‑12)**;

3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

4 in accordance with Resolution **95 (Rev.WRC‑07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6 to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;

7 to consider possible changes, and other options, in response to Resolution86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC‑07)** to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary‑satellite orbit;

8 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC‑07)**;

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC‑15;

9.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and

9.3 on action in response to Resolution **80 (Rev.WRC‑07)**;

10to 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,

resolves further

to activate the Conference Preparatory Meeting,

invites the Council

to finalize the agenda and arrange for the convening of WRC‑19, and to initiate as soon as possible the necessary consultations with Member States,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC‑19,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

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**ATTACHMENT 1**

**ADD ASP/ xxA24/14**

Draft New Resolution [ASP-B10- IMT\_ABOVE\_6GHz]

**Studies on frequency-related matters for IMT identification including possible additional allocations to the mobile services on a primary basis in portion(s) of the frequency range between 25.25 and 86 GHz for the future development of IMT for 2020 and beyond**

The World Radiocommunication Conference (Geneva, 2015),

*considering*

*a)* that International Mobile Telecommunications (IMT) systems have contributed to global economic and social development as the main method of providing mobile broadband applications.

*b)* 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;

*c)* that ITU-R addressed the framework and overall objectives of the future development of IMT for 2020 and beyond in the Recommendation ITU-R M.[IMT.VISION] enabling gigabit-per-second user data rate and high quality of user experience (QoE) provided by a wide contiguous bandwidth in higher frequency bands above 6 GHz;

*d)* that the technical feasibility of IMT in bands above 6 GHz is addressed in the Report ITU-R M.[IMT.ABOVE 6 GHz];

*e)* that it may be required to study additional spectrum requirements to meet the gigabit-per-second user data rate, high quality of user experience (QoE) and user demands in dense urban areas and/or in peak times;

*f)* that ITU-R developed a work plan, timeline, process and required deliverables for the IMT-2020 development in order to transform the above framework and overall objectives into the reality of IMT systems, which are expected to be deployed from the year 2020 onwards;

*g)* that ITU-R has started the studies on the propagation characteristics in higher frequency bands above 6 GHz;

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

*j)* that adequate and timely availability of spectrum and supporting regulatory provisions is essential to realize the objectives in Recommendation ITU-R M.[IMT.VISION];

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

*l)* the need to protect existing services when considering frequency bands for possible additional allocations to any service;

*noting*

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

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

*c)* that Resolution ITU‑R [IMT.PRINCIPLES] addresses the principles for the process of development of IMT for 2020 and beyond,

*recognizing*

*a)* that timely availability of spectrum is important to support the future development of IMT,

*b)* that the possibility of securing contiguous wide bandwidth in the higher frequency ranges is more promising;

*c)* the usage of relevant parts of the spectrum by other radiocommunication services, many of which involve significant investment in infrastructure or represent significant societal benefit, and the evolving needs of these services,

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

e) that the preamble of the Radio Regulations provides objectives including:

* *to facilitate the efficient and effective operation of all radiocommunication services; and*
* *to provide for and, where necessary, regulate new applications of radiocommunication technology.*

*resolves to invite ITU‑R*

1 to study spectrum demands associated with the capabilities required for development of IMT-2020 taking into account:

– evolving needs, such as very high data rates, to satisfy user demand for IMT;

– situations with high data traffic demands , such as in dense urban areas and/or in peak times;

– technical and operational characteristics of IMT systems in the high frequency range, including the evolution of IMT through advances in technology and spectrally-efficient techniques, and their deployment;

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

2 to study potential candidate frequency bands for IMT including possible additional allocations to the mobile service on a primary basis within the ranges contained in Annex 1to this Resolution, taking into account the results of the studies under *resolves to invite ITU‑R* 1, and to the extent practicable, the need for harmonization;

*further resolves*

1 to accelerate development and completion of the technical and operational characteristics required to carry out sharing and compatibility studies involving the systems referred to as IMT-2020

2 that the studies referred to in *resolves to invite ITU‑R* 2 include sharing and compatibility studies with services already having allocations on a primary basis in the potential candidate bands and in adjacent bands, as appropriate, taking into account potential mitigation techniques that may need to be employed by IMT systems.

3 to invite WRC‑19 to consider the results of the above studies and take appropriate actions,

*encourages Member States, Sector Members, Academia, and Associates*

to participate in the studies by submitting contributions to ITU‑R.

**Reasons:** A draft new Resolution that supports the proposed WRC-19 agenda item for the future development of IMT for 2020 and beyond.

**ANNEX 1 TO DRAFT NEW RESOLUTION [ASP-B10- IMT\_ABOVE\_6GHz]**

**Frequency ranges mentioned in resolves to invite ITU‑R of DRAFT NEW RESOLUTION [ASP-B10- IMT\_ABOVE\_6GHz]**

| From (GHz) | To (GHz) | Bandwidth (GHz) |
| --- | --- | --- |
| 25.25 | 25.5 | 0.25 |
| 31.8 | 33.4 | 1.6 |
| 39 | 47 | 8 |
| 47.2 | 50.2 | 3 |
| 50.4 | 52.6 | 2.2 |
| 66 | 76 | 10 |
| 81 | 86 | 5 |

**ANNEX TO ATTACHEMENT 1**

|  |  |
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| **Subject:** Proposalto consider possible identification of some frequency band(s) within 6-100 GHz for the future development of IMT for 2020 and beyond, in accordance with Resolution **[ASP-B10- IMT\_ABOVE\_6GHz] (WRC-15)**; | |
| **Origin: Republic of Korea, Japan, China, Australia, Singapore, New Zealand** | |
| ***Proposal:***  To consider identification of frequency bands for IMT in portion(s) of the frequency range between 25.25 and 86 GHz including possible additional allocations to the mobile service on a primary basis in accordance with Resolution **[ASP-B10- IMT\_ABOVE\_6GHz] (WRC-15)**; | |
| ***Background/reason:***  Today’s world is powered by information: the opportunities created by Information and Communication Technology (ICT) development have been one of the main impacting factors on how society evolved in recent decades.  In 2020 and beyond wireless communication applications will expand into new market segments such as smart grid, e-health, intelligent transport systems (ITS), traffic control and safety. These new market segments and the need for further enhanced mobile broadband applications, are expected to bring higher requirements (e.g., very high data rates, large number of connections, ultra-low latency and high reliability) compared to those addressed in today’s IMT application areas.  In order to address these higher requirements, future IMT technologies should have the capability to be operated in wider bandwidths while providing higher spectral/areal efficiency. Considering hardware implementation complexity in modern smart mobile devices and to maximize data delivery efficiency, it would be desirable to use contiguous wide bandwidth, to address these requirements. In principle, the possibility of securing contiguous wide bandwidth in high frequency ranges is more promising compared to that in low frequency ranges. In future IMT, bandwidths to support different usage scenarios, such as enhanced mobile broadband, ultra-reliable and low-latency communications, and massive machine type communications, would vary. For those scenarios requiring several hundred MHz up to at least 1 GHz, there would be a need to consider wideband contiguous spectrum above 6 GHz.  With these motivations, ITU-R Working Party 5D has finalized Draft New ITU-R Recommendation on “IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond” and Draft New ITU-R Report on “Technical feasibility of IMT in bands above 6 GHz”. In addition, research is taking place at the global/regional/national levels for future mobile communications, emphasizing the possible use of higher frequency bands. It is expected that the bands above 6 GHz can be utilized for future IMT technologies.  Considering the above background, it is believed that higher frequency bands will be critical and essential for future IMT development with very high capacity, and it is therefore proposed to consider identification of IMT in the higher frequency bands above 6 GHz, including possible additional allocations to the mobile service on a primary basis, while taking into account results of sharing and compatibility studies including those already performed in ITU-R. | |
| ***Radiocommunication Services concerned:***  Mobile Service and other services already allocated in the frequency bands to be studied. | |
| ***Indication of possible difficulties:***  Establishing sharing conditions between IMT and other incumbent applications of existing services. | |
| ***Previous/ongoing studies on the issue:***  Some studies have already been finalized and are now ongoing in the ITU-R WP 5D. These finalized studies includes, amongst others:  Report ITU-R M.2320,  Draft New Recommendation ITU-R M.[IMT.VISION] (Document [5/199](http://www.itu.int/md/R12-SG05-C-0199/en)),  Draft New Report ITU-R M.[IMT.ABOVE 6 GHz] (Document [5/208](http://www.itu.int/md/R12-SG05-C-0208/en)),  Draft New Report ITU-R M.[IMT.BEYOND2020.TRAFFIC] (Document [5/202](http://www.itu.int/md/R12-SG05-C-0202/en)). | |
| ***Studies to be carried out by:***  ITU-R WP 5D, TBD | ***with participation of:***  Member States, Sector Members, Academia, and Associates. |
| ***ITU-R Study Groups concerned:***  ITU-R Study Groups, depending on what frequency bands or ranges would be selected. | |
| ***ITU resource implications, including financial implications (refer to CV 126):***  Studies associated to this proposed new agenda item should normally be carried out within the ITU-R procedures and planned budget. | |
| ***Common regional proposal:***  Yes | ***Multicountry Proposal:*** No  ***Number of countries:*** |
| ***Remarks*** | |

**ATTACHEMENT 2**

**ADD ASP/ xxA24/15**

Draft New Resolution [ASP-C10-MS&FS\_ABOVE\_275GHz] (WRC-15)

**Appropriate regulatory measures for the land mobile and fixed services operating in the frequency range 275-1 000 GHz**

The World Radiocommunication Conference (Geneva, 2015)

considering

1. that a number of bands in the frequency range 275-1 000 GHz are identified for use by administrations for passive services, such as the radio astronomy service, Earth exploration satellite service (passive), and space research service (passive);
2. that No.5.565 states that the use of the range of 275-1 000 GHz by passive services does not preclude use of this range by active services;
3. that administrations wishing to make frequencies in the 275-1 000 GHz range available for active service applications are urged to take all practicable steps to protect these passive services from harmful interference until the date when the Table of Frequency Allocation is established in the above-mentioned 275-1 000 GHz frequency;
4. that the active devices which can operate at the room temperature in the band above 275 GHz becomes feasible due to the significant efforts of many R & D organizations;
5. that research and development organizations have demonstrated ultra-high-speed data communication systems up to 100 Gbps operating in the band above 275 GHz;
6. that the IEEE is developing their standards for devices using the frequency band above 275 GHz;
7. that the propagation characteristics of frequencies above 275 GHz have also been studied by ITU-R Study Group 3;
8. that the study on technical and operational characteristics of active services operating in the range 275-1 000 GHz has been carried out by ITU-R;
9. that as a result of considering h), the study on technical and operational characteristics of the land mobile and fixed services operating in the frequency range 275-1 000 GHz has been started in ITU-R;
10. that WP 7C noted that there is a potential interference from active services in the frequency range 275-1 000 GHz where atmospheric attenuation is low.
11. that coexistence of passive services identified by RR No. 5.565 with newly introduced active services is to be ensured;
12. that the technical and operational characteristics of the land mobile and fixed services operating in the frequency range 275-1 000 GHz have not been specified and further studies are required;
13. that the propagation models of the land mobile and fixed services operating in the frequency range 275-1 000 GHz are required;
14. that the sharing and compatibility studies between passive services and the land mobile and fixed services operating in the frequency range 275-1 000 GHz have not been studied;

noting

1. that Question ITU-R 228-1/3“Propagation data required for the planning of radiocommunication systems operating above 275 GHz” addresses studies on propagation models best describing the relationship between atmospheric parameters and electromagnetic wave characteristics on terrestrial links operating at frequencies above 275 GHz;
2. that Question ITU-R 264/4 “Technical and operational characteristics of networks of the fixed-satellite service operating above 275 GHz” addresses studies on the technical and operational characteristics of Earth-to-space, space-to-Earth, and space-to-space links at frequencies above 275 GHz;
3. that Question ITU-R 235-1/7“Technical and operational characteristics of applications of science services operating above 275 GHz” addresses guides studies on the technical and operational characteristics of systems operating at frequencies above 275 GHz within the science service;
4. that Question ITU-R 237/1“Technical and operational characteristics of the active services operating in the range 275-1 000 GHz” addresses studies on the technical and operational characteristics of active services in the frequency range 275-1 000 GHz;
5. that Recommendation ITU-R [P.676](http://www.itu.int/rec/R-REC-P.676/en)-10 “Attenuation by atmospheric gases” provides methods to estimate the attenuation of atmospheric gases on terrestrial and slant paths using an estimate of gaseous attenuation computed by summation of individual absorption lines that is valid for the frequency range 1-1000 GHz and a simplified approximate method to estimate gaseous attenuation that is applicable in the frequency range 1-350 GHz;
6. that Recommendation ITU-R [P.838](http://www.itu.int/rec/R-REC-P.836/en)-3 “Specific attenuation model for rain for use in prediction methods” provides the prediction methods of the specific attenuation model for rain;
7. that Recommendation ITU-R [P.840](http://www.itu.int/rec/R-REC-P.840/en)-6 “Attenuation due to clouds and fog” provides methods to predict the attenuation due to clouds and fog on Earth-space paths;
8. that Report ITU-R RA.2189“Sharing between the radio astronomy service and active services (Airborne system, non-GSO system) in the frequency range 275-3 000 GHz” provides that sharing between radio astronomy and active services in the range 275-3 000 GHz;
9. that Report ITU-R F.2323-0 “Fixed service use and future trends” provides guidance on the future development of the fixed service (FS) taking into account evolution of current use and technology development, application trends for fixed wireless systems and future requirements for fixed wireless systems;
10. that Report ITU-R SM.2352-0 “Technology trends of active services in the frequency range 275-3 000 GHz” provides technology trends of active services in the frequency range 275-3 000 GHz;

resolves to invite WRC-19

to consider the appropriate regulatory measures to identify the land mobile and fixed services operating in the frequency range 275-1 000 GHz, taking into account the results of ITU-R studies;

invites ITU-R

1. to identify potential characteristics of systems in the land mobile and fixed services operating in the frequency range 275-1 000 GHz;
2. to study spectrum requirements of the land mobile and fixed services, taking into account technical and operational characteristics of those services operating in the frequency range 275-1 000 GHz;
3. to conduct sharing and compatibility studies between passive and the land mobile and fixed services, as well as among active services, operating in the frequency range 275-1 000 GHz;
4. to study potential candidate frequency bands for use of the land mobile and fixed services, taking into account the results of the studies under invite ITU-R 1, 2 and 3 and the protection of passive services identified in RR No.5.565.

encourages Member States, Sector Members, Academia, and Associates

to submit contributions during the study period on their assessment of the impact on the identified services, based on the studies carried out under this Resolution.

invites administrations

to participate in the studies by submitting contributions to ITU-R.

**Reasons:** A draft new Resolution that supports the proposed WRC-19 agenda item for the land mobile and fixed services operating in the frequency range 275-1 000 GHz

**ANNEX TO ATTACHEMENT 2**

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| **Subject:** to consider the appropriate regulatory measure appropriate regulatory measures to identify the land mobile and fixed services operating in the frequency range 275-1 000 GHz. | |
| **Origin:** Japan | |
| ***Proposal:***  To consider the appropriate regulatory measure appropriate regulatory measures to identify the land mobile and fixed services operating in the frequency range 275-1 000 GHz, taking into account the frequency bands for passive services identified by RR no. **5.565** and the results of ITU-R studies of sharing and compatibility between passive and active services as well as spectrum requirements for those services, in accordance with Resolution **[ASP-C10-MS&FS\_ABOVE\_275GHZ] (WRC-15)** | |
| ***Background/reason:***  The frequency range above 275 GHz may be used for experimentation with, and development of, various activeand passive services according to RR No. **5.565**. However, RR No. **5.565** was reviewed in accordance with Resolution **950 (Rev. WRC-07)**, and the specific frequency bands were identified for measurements by passive services, such as the radio astronomy service, the Earth exploration satellite service (passive), and the space research service (passive). In the specific identification of the frequencies in the range of 275-1 000 GHz, the passive services do not preclude use of this range by active services  The active devices which can operate above 275 GHz were extensively studied and developed by many R & D organizations. The propagation characteristics of the frequencies above 275 GHz have been also studied by ITU-R and the applications of short-range ultra-high-speed (100-Gbps) data communication systems have been discussed within IEEE 802.15 Working Group. The Task Group IEEE 802.1.5.3d has been recently established to create WPAN (Wireless Personal Area Network) standards using the frequencies above 275 GHz within a few years. Several ultra-high-speed transmission applications such as wireless links for data centers, near field communication for toll gate downloading, and fronthaul/backhaul for mobile systems are expected to be operated in the band above 275 GHz.  ITU-R WP1A has developed a Question ITU-R 237/1, “Technical and operational characteristics of the active services operating in the range 275-1 000 GHz”, to study the technical and operational characteristics of active services in the frequency range 275-1 000 GHz. According to the Question, ITU-R WP1A has completed the new Report ITU-R SM.2352-0, “Technology trends on active services in the frequency range 275-3 000 GHz” to provide technical information for preparation of sharing and compatibility studies between active and passive services, as well as among active services. Also the other relevant Working Parties, WP3K, WP3M, WP4A, WP5A, WP5C, WP7C and WP7D started collaborating with WP1A to update the above Report considering the fields under their responsibilities.  Based on the study results of WP1A, WP5A and WP5C, it was found that the frequency band 275-1 000 GHz is indispensable for the use of terahertz devices in the land mobile and fixed service applications which require high-speed and high-capacity data transmission above 100 Gbps. Therefore, the frequency band 275-1 000 GHz should be identified for the land mobile and fixed services. | |
| ***Radiocommunication Services concerned:***  LMS, FS, RAS, EESS (Space-to-Earth), SRS (Space-to-Earth) | |
| ***Indication of possible difficulties:***  Identification of technical requirements for the terrestrial services and sharing and compatibility studies with RAS, EESS(Space-to-Earth), and SRS (Space-to-Earth) | |
| ***Previous/ongoing studies on the issue:***  Question ITU-R 237/1, Report ITU-R SM.2352-0 | |
| ***Studies to be carried out by:***  ITU-R WP 5A and WP 5C | ***with participation of:***  Member States, Sector Members, Academia, and Associates. |
| ***ITU-R Study Groups concerned:***  SG7 | |
| ***ITU resource implications, including financial implications (refer to CV 126):***  ITU-R WP 5A and WP 5C | |
| ***Common regional proposal:***  Yes | ***Multicountry Proposal:*** No  ***Number of countries:*** |
|  | |

**ATTACHEMET 3**

**ADD ASP/ xxA24/16**

Draft New Resolution [ASP-D10-ITS](WRC-15)

**Spectrum related matters and possible regulatory actions for Intelligent Transport Systems applications**

The World Radiocommunication Conference (Geneva, 2015)

considering

1. that Intelligent Transport Systems (ITS) utilize a combination of technologies such as computers, telecommunications, positioning, and automation to improve safety management, efficiency, usability and environmental sustainability of terrestrial transportation systems;
2. that ITS technologies are already integrated in a vehicle system to provide new ITS communication applications and to secure safe driving;
3. that there is a need for consideration of spectrum requirements and possible regulatory actions for ITS applications, which are being used globally or regionally, in case of considering spectrum usage plans by administrations or regions in the future;
4. that there is a need to integrate various technologies including radiocommunications into land transportation systems;
5. that many new land transportation systems use intelligence in land vehicles coupled with advanced vehicle, advanced traffic management, advanced traveller information, advanced public transportation, and advanced fleet management systems to improve traffic management;
6. that ITS is being planned and implemented in three Regions by various administrations;
7. that there exist wide variety of applications ;
8. that international standards would facilitate worldwide application of ITS and provide for
9. economies of scale in bringing ITS equipment and services to the public;
10. that international or regional compatibility of ITS may be dependent on identified radio spectrum allocations;
11. the ISO is standardizing ITS (non-radio aspects) in ISO/TC204 including applications
12. for “cooperative systems” which require vehicle-to-vehicle and vehicle-to-infrastructure
13. radiocommunications;
14. the 3GPP is standardizing radio interface, system architecture and service requirements of “LTE-based V2X Services” for ITS application in both 3GPP Radio Access Network (RAN) and Service & Systems Aspects (SA) working group.
15. that next generation vehicular radiocommunication technologies and ITS broadcast systemsare emerging;
16. that the frequency band 5770-5850 MHz is used for ETC and vehicle safety support by some administrations in Regions 1 and 3;

recognizing

that Resolution **654 (WRC-12)**, in *invites ITU-R iii)*, calls for the conduct of technical, operational and regulatory studies, as a matter of urgency, including *“spectrum requirements, operational characteristics and evaluation of ITS safety-related applications that would benefit from global or regional harmonization”;*

noting

1. that the guidelines for radio interface requirements of ITS are described in Recommendation ITU-R M.1890;
2. that outlines of technologies and characteristics for Dedicated Short Range Communications at 5.8 GHz are described in Recommendation ITU-R M.1453-2;
3. that studies and feasibility tests on advanced ITS radiocommunications have been actively conducted towards the realization of traffic safety and a reduction of environmental impact is described in Report ITU-R M.2228;

resolves to invite WRC-19

to consider spectrum related matters and possible regulatory actions- for ITS applications, in the land mobile service to which the bands have been already allocated, taking into account the results of ITU‑R studies,

invites ITU-R

to study the spectrum related matters and potential frequency bands for ITS applications, taking into account the protection of services to which the frequency bands is currently allocated and recognizing frequency bands currently used for ITS applications;

invites administrations

to contribute actively to the ITU-R studies on this issue.

**Reasons:** A draft new Resolution that supports the proposed WRC-19 agenda item for ITS application.

**ANNEX TO ATTACHEMENT 3**

|  |  |
| --- | --- |
| **Subject: spectrum** related matters **and possible regulatory actions for ITS applications** | |
| **Origin:** Japan | |
| ***Proposal:*** *to consider*  *spectrum* related matters *and possible regulatory actions for ITS applications, taking into account the results of ITU‑R studies, in accordance with Resolution****[ASP-D10-AIS](WRC-15).*** | |
| ***Background/reason:***  The proposal presented in this document aims to consider spectrum requirements and possible regulatory actions for Intelligent Transport Systems (ITS) applications throughout the world.  Since 1995, research and development activities have been conducted in info-communication systems as core technologies of ITS. ITS, including ETC (Electronic Toll Collection) and millimeter-wave radars, have been globally deployed. Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications called *“co-operative ITS”* have been developing to achieve safe drive support systems.  Due to the widespread use of ITS technologies and the increasing need for safe driving through use of ITS technologies, the spectrum requirement for ITS applications is increasing, particularly since:  - Communicating with moving vehicles is one of the typical use cases for radiocommunications, and a variety of ITS applications, such as ETC (Electronic Toll Collection), greatly depend on functionality of radiocommunication.  - Radiocommunication technology would be essential to the next generation of ITS, especially for safe driving support system and automated driving system, etc.  International standardization activities for ITS info-communication systems have been conducted by ITU-R and ISO at the global level, by ETSI, CEN, ARIB and others at the regional level, and by IEEE, SAE and other organizations in the private sector. In ITU-R, several recommendations and reports have been published, as follows:  - Recommendation ITU-R M.1890, “Intelligent Transport Systems – Guidelines and Objectives”,2011.  - Recommendation ITU-R M.1453-2, “Intelligent Transport Systems – Dedicated Short Range  Communications at 5.8GHz”, 2005.  - Recommendation ITU-R M.1452-1, “Millimetre wave radiocommunication systems for ITS  applications”, 2009.  - Report ITU-R M.2228, “Advanced Intelligent Transport Systems (ITS) radiocommunications”, 2012.  - Recommendation ITU-R M.[V2X], “Radio interface standards of vehicle-to-vehicle and  vehicle-to-infrastructure communications for intelligent transport systems applications”, to be  published in 2015  - Report ITU-R M.[ITS USAGE] “Intelligent transport systems usage Report in ITU Member  States”, to be published in 2016  As it is noted, ITS applications have been deployed worldwide. As core technologies, ITS became important in resolving road traffic problems such as congestion and accidents. However, ITS industries do not always recognize the significance of radio spectrum in the global or regional deployment of ITS applications, since ITS industries are combinations of electronics, communications, civil engineering, automotive and other related industries.  In the U.S.A. and Europe, the study of sharing ITS spectrum to be used for V2V and V2I, with Radio Local Area Network (RLAN), has begun. In this way or manner, from the perspective of efficient use of the spectrum, some frequency bands which have been used for ITS applications for many years or planned to be used, are being actively studied with a view to sharing with other applications in some administrations or regions. | |
| ***Radiocommunication Services concerned:***  Mobile Service, Concerned impacted services | |
| ***Indication of possible difficulties:***  Spectrum sharing with the other mobile services such as cellular phones and RLAN. | |
| ***Previous/ongoing studies on the issue:***  ITU-R Recommendation M.1452-1, M.1453-2, M.1890, M.[V2X],  ITU-R Report M.2228, M.[ITS USAGE] | |
| ***Studies to be carried out by:***  ITU-R SG5 WP 5A | ***with participation of:***  Member States, Sector Members, Academia, and Associates. |
| ***ITU-R Study Groups concerned:***  SG1, SG5 | |
| ***ITU resource implications, including financial implications (refer to CV 126):***  ITU-R SG5 WP 5A usually has biannual meetings which last 10days each. | |
| ***Common regional proposal:***  Yes | ***Multicountry Proposal:***No  ***Number of countries:*** |
| ***Remarks*** | |

**ATTACHEMET 4**

**MOD ASP/ xxA24/17**

RESOLUTION 359 (WRC‑15)

Consideration of regulatory provisions for modernization of the   
Global Maritime Distress and Safety System and   
studies related to e‑navigation

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that there is a continuing need in the Global Maritime Distress and Safety System (GMDSS), on a global basis, for improved communications to enhance maritime capabilities;

*b)* that the International Maritime Organization (IMO) has initiated work plans for GMDSS modernization;

*c)* that the Automatic Identification System (AIS) offers potential enhancements to VHF maritime safety communications;

*d)* that advanced maritime MF/HF/VHF data systems and satellite communication systems may be used to deliver Maritime Safety Information (MSI) and other GMDSS communications;

*e)* that additional global and regional GMDSS satellite providers may be considered by IMO;

*f)* that IMO is developing a strategy and implementation plan for e‑navigation, defined as the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth-to-berth navigation and related services for safety and security at sea and protection of the marine environment;

*g)* that GMDSS modernization may be influenced by the development of e‑navigation,

noting

that WRC‑12:

*a)* has reviewed Appendix **17** and Appendix **18** to improve efficiency and introduce bands for new digital technology;

*b)* has reviewed the regulatory provisions and spectrum allocations for use by maritime safety systems for ships and ports,

recognizing

*a)* that advanced maritime communication systems may support the implementation of GMDSS modernization and e‑navigation;

*b)* that IMO efforts to implement GMDSS modernization and e‑navigation may require a review of the Radio Regulations to accommodate advanced maritime communication systems;

*c)* that due to the importance of these radio links in ensuring the safe operation of shipping and commerce and security at sea, they must be resilient to interference,

resolves to invite WRC‑19

1 to consider possible regulatory actions, including spectrum allocations based on the ITU‑R studies, to support GMDSS modernization;

2 to consider possible regulatory actions, including spectrum allocations based on the ITU‑R studies, for maritime mobile service supporting e‑navigation,

invites ITU‑R

to conduct studies, as a matter of urgency, taking into consideration the activities of IMO, in order to determine spectrum requirements to support GMDSS modernization, the implementation of e‑navigation and propose possible regulatory actions,

invites

all members of the Radiocommunication Sector, IMO, the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Electrotechnical Commission (IEC), the International Hydrographic Organization (IHO), the International Organization for Standardization (ISO) and the World Meteorological Organization (WMO) to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of IMO and other international and regional organizations concerned.

**Reasons:** A updated Resolution 359(WRC-12) that supports the proposed WRC-19 agenda item for GMDSS.

**ANNEX TO ATTACHEMENT 4**

**Subject:** Proposal to maintain consideration of regulatory provisions for update and modernization of the Global Maritime Distress and Safety System (GMDSS) and studies related to e-navigation as an agenda item for WRC-19

**Origin:** New Zealand and Australia

|  |  |
| --- | --- |
| ***Proposal:*** *to consider regulatory actions, including spectrum allocations, to support GMDSS modernization and implementation of e-navigation in accordance with Resolution* ***359 (WRC-15)*** | |
| ***Background/reason:*** Resolution **808 (WRC-12)** included in the preliminary agenda for the upcoming WRC under item 2.1 - *to consider regulatory actions, including spectrum allocations, to support GMDSS modernization and implementation of e-navigation in accordance with Resolution* ***359 (WRC-12)***.  IMO plans to continue the modernization plan for the GMDSS through to 2018 with further work to be undertaken on the implementation of e-navigation during the 2016 to 2019 study period.  The ITU Radio Regulations contain many provisions, articles, appendices and Recommendations associated with the GMDSS. Changes to the Radio Regulations are expected to be necessary to support updates to the GMDSS, including GMDSS modernization and e-navigation. | |
| ***Radiocommunication services concerned:*** Maritime mobile service and mobile-satellite service | |
| ***Indication of possible difficulties:*** None foreseen | |
| ***Previous/ongoing studies on the issue:***] | |
| ***Studies to be carried out by:***  ITU-R Working Party 5B | ***with the participation of:***  Member States, Sector Members, Academia, Associates, International Maritime Organization (IMO), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), and International Mobile Satellite Organization (IMSO) |
| ***ITU-R Study Groups concerned:*** ITU-R Study Groups 4 and 5 | |
| ***ITU resource implications, including financial implications (refer to CV126):*** ITU-R Working Party 5B usually has meetings twice a year which both last ten days | |
| ***Common regional proposal:*** Yes/No | ***Multicountry proposal:*** Yes  ***Number of countries:*** |
| ***Remarks*** | |

**ATTACHEMENT 5**

**MOD ASP/ xxA24/18**

Draft New Resolution [ASP-E10-GADSS]

**Aircraft Tracking and Distress Communications**

The World Radiocommunication Conference (Geneva, 2015)

considering

*a)* that there are growing requirements to track airline flights, no matter their global location or destination;

*b)* that new technologies, including satellite technologies, are being developed to support communications and air navigation, including surveillance applications;

*c)* that in the event of aircraft distress situations, additional communications may be required,

*recognizing*

*a)* that the International Civil Aviation Organization is developing a concept of operations to support future development of a Global Aeronautical Distress and Safety System (GADSS) , and identifying near term capabilities for normal flight tracking using existing technologies;

*b)* that the constituent elements of the systems discussed in *recognizing a)* are not yet defined by ICAO,

resolves to invite WRC-19

taking into account the results of ITU-R studies, to consider regulatory provisions to facilitate the introduction of GADSS in aeronautical services bands to address requirements for the functions discussed in *considering a)* and *recognizing a)*,

invite the ITU-R

to conduct in time for WRC-19, necessary sharing and compatibility studies to ensure protection of existing services within the frequency bands that may be identified for the functions discussed in *considering a)* and *recognizing a)*,

further invites

the International Civil Aviation Organization (ICAO), the International Air Transport Association, administrations and other organizations concerned to participate in the studies identified in *invites the ITU‑R* above,

instructs the Secretary General

to bring this resolution to the attention of ICAO.

**Reasons**: A draft new **Resolution** that supports the ITU-R studies needed under the proposed WRC-19 agenda item for GADSS.

**ANNEX TO ATTACHEMENT 5**

**Subject:** Proposal of a new agenda item for WRC-19 to support ongoing International Civil Aviation Organization activities to improve aircraft tracking, and to facilitate aircraft communications in the event of emergencies

**Origin:** New Zealand, Australia and India.

|  |  |
| --- | --- |
| ***Proposal:*** *to address evolving needs of the Global Aeronautical Distress and Safety System* *in accordance with Resolution*  ***[ASP-E10-GADSS](WRC-15)*** | |
| ***Background/reason:*** The International Civil Aviation Organization (ICAO) held a Special Meeting on Global Flight Tracking of Aircraft in Montreal May 2014, and formed two groups to address the near-term priority to track airline flights, no matter their global location or destination and the development of a Global Aeronautical Distress and Safety System (GADSS). Those groups were an ICAO ad hoc Working Group to develop a concept of operations to support future development of a Global Aeronautical Distress and Safety System (GADSS) and an industry led group under the ICAO framework called the Aircraft Tracking Task Force (ATTF) to identify near term capabilities for normal flight tracking using existing technologies. Elements of the final global flight tracking (GFT) configuration and the concept of operations to support GADSS will not be available by WRC-15.  Given the recent trend toward performance-based communications, navigation and/or surveillance, the final configuration may be a “system of systems” composed of both current and evolving capabilities. In order for the future GADSS to meet the needs of all aircraft, consideration must be given to systems for commercial and transport aircraft, as well as general aviation and business aircraft. Since it is anticipated that changes to the Radio Regulations will be necessary in order to facilitate the implementation of such systems, a future Conference (WRC-19) agenda item is required to address evolving GFT applications and the development of the GADSS. | |
| ***Radiocommunication services concerned:*** Fixed-Satellite service, Mobile-Satellite service, Mobile service, Radiodetermination service and Radiodetermination Satellite service | |
| ***Indication of possible difficulties:*** Timeliness of system information from ICAO | |
| ***Previous/ongoing studies on the issue:*** Work in association with Resolution 185 (Busan, 2014) | |
| ***Studies to be carried out by:***  ITU-R Working Parties 5B and 4C | ***with the participation of:***  Member States, Sector Members, Academia, Associates, and International Mobile Satellite Organization (IMSO) |
| ***ITU-R Study Groups concerned:*** ITU-R Study Groups 4 and 5 | |
| ***ITU resource implications, including financial implications (refer to CV126):*** ITU-R Working Party 5B usually has meetings twice a year which both last ten days | |
| ***Common regional proposal:*** Yes/No | ***Multicountry proposal:*** Yes  ***Number of countries:*** |

**ATTACHMENT 6**

ADD ASP/ xxA24/19

Draft New Resolution [ASP-F10-AIS](WRC-15)

Consideration of possible frequency requirement and regulatory procedures for protecting automatic identification system (AIS) and supporting novel devices using AIS technology

The World Radiocommunication Conference (Geneva, 2015),

considering

1. that the automatic identification system (AIS) is a proven technology for maritime safety applications, which provides functions of identification, safety of navigation functions, aids to navigation, locating signals, and data communications;
2. that there is a need to recognize and identify objects in the maritime environment for safety of navigation, such as fishing nets, towed unpowered ships and barges, derelict ships, floating ice, wave-gliders, and drifting buoys;
3. that there has been development of devices using AIS-like technologies for maritime safety in the market, and the number is predicted to be larger in the future;
4. that these devices need unique identifications rather than those used by personal or ship-borne equipment;
5. that these novel devices are transmitting only, and not for alerting purpose,

recognizing

1. that ships complying with the International Convention for the Safety of Life at Sea (SOLAS) 1974 (as amended) and other ships equipped with automated radiocommunication systems, including AIS, digital selective calling (DSC) and/or other alerting devices of the GMDSS should be assigned the maritime mobile service identities (MMSIs) in accordance with Annex 1 to Recommendation ITU-R M.585;
2. that the purpose and integrity of AIS as stated in the requirements of SOLAS Chapter V should be protected;
3. that maritime identities used for some other maritime devices for special purposes should be assigned as specified in Annex 2 to the Recommendation ITU-R M.585;
4. that a possible new type of richer identification is needed for potentially huge quantities of these kind novel devices,

further recognizing

1. that the majority of novel devices using AIS technology are operating in frequency bands of AIS1 and AIS2, and to some extent, occupying the resources of maritime mobile service identities (MMSIs) for ship stations or aids to navigation ;
2. that because of the lack of proven standards for these kinds of novel devices, evaluation of effects to the functioning of AIS used for the safety of navigation, and especially to search and rescue activities implemented by AIS-search and rescue transmitters (AIS-SARTs), is required;
3. that the possible additional channel(s) might be considered within existing MMS frequency bands;
4. the increasing usage of these kinds of novel devices urges related regulatory studies,

noting

1. that WRC-12 designated channels in Appendix **18** to the Radio Regulations for experiments and testing for the future new AIS applications or systems;
2. that ITU-R Working Party 5B is studying a future new maritime identification scheme,

resolves to invite WRC-19

to consider, based on the results of ITU-R studies, the need and possible regulatory procedures, including spectrum requirement and identifications for novel devices using Automatic Identification System technology, within the bands allocated to the maritime mobile service,

invites ITU-R

to conduct the necessary studies for WRC-19 to determine the regulatory requirements, and possible frequency bands for novel devices using AIS technology, provided that there is no harmful effects to the integrity of AIS and GMDSS functions,

invites ITU-R members

to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization (IMO), International Civil Aviation Organization(ICAO), International Electro-technical Commission (IEC), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), and theInternational Maritime Radio Association (CIRM), and other international and regional organizations concerned.

**Reasons:** A draft new Resolution that supports the proposed WRC-19 agenda item for AIS.

**ANNEX TO ATTACHEMET 6**

**Subject:** Propose a new agenda item for WRC -19

**Origin:** People's Republic of China

|  |  |
| --- | --- |
| ***Proposal:*** to consider possible frequency requirement and protection regulatory procedures for protecting general automatic identification system (AIS) and supporting novel devices using AIS technology, in accordance with **Resolution [ASP/H10/AIS] (WRC-15)** | |
| ***Background/reason:***  1 The automatic identification system (AIS) is a proven technology for globally maritime safety applications, which provides identification, safety of navigation, aids to navigation, locating signals, and data communication functions. The frequency bands corresponding with AIS1 and AIS2 used as locating signals by AIS-SARTs are listed in Appendix **15** to the Radio Regulations, as are distress and safety frequencies for radiocommunications for the Global Maritime Distress and Safety System (GMDSS). The protection to AIS VHF Data Link (VDL) is essential.  2 At present, there is a need of recognizing and identifying some sorts of free floating objects, such as fishing nets, towed unpowered ships and barges, derelict ships, floating ice, wave-gliders and drifting buoys,for safety of navigation or other purposes, brings increasing novel devices using AIS technology in the market, and the number is predicted to be larger in the future.  3 A contribution in 14th session of ITU-R Working Party 5B (WP 5B) indicated concerns on the allotment and management of identities for these kinds of novel devices. During discussion, some administrations questioned the appropriateness of using channels AIS 1and AIS 2 of Appendix **18** to the Radio Regulations, for various novel devices freely floating in the water, but not associated with a person or ship.  4 A rough survey shows that there are very similar trends of these kinds of applications in China. And itis noted that the novel devices might cause adverse effects to safety applications of AIS in the following aspects:  1) these kinds of novel devices are using frequency bands AIS1 and AIS2, spending and threatening resources of AIS VDL;  2) identities might be assigned randomly to these kinds of novel devices, as there is not any harmonized regulation, in some situations, causing MMSIs for ship stations or aids to navigation to be consumed;  3) there is no proven standard for these kinds of novel devices regulating key technology specifications such as transmitter power, data structure, package length, and reporting interval, which indicates that evaluation of effects on AIS used for safety of navigation, and especially to search and rescue using AIS-search and rescue transmitters (AIS-SARTs) is desirable;  4) the lack of harmonized operational and regulatory requirements for these kinds of novel devices might cause confusion on reading information of electronic nautical charts (ENCs), and misunderstanding or misidentifying the objects, potentially causing adverse effects to safety of navigation.  5 For the purpose of protecting the VDL, conserving maritime identity resources, AIS used for safety purposes, and at the same time, supporting the increasing applications of maritime novel devices, it is proposed that ITU-R conduct in time for WRC-19, the necessary studies to determine the regulatory requirements, and potentialfrequency bands for novel devices using AIS technology, on condition that no harmful effects are caused to the integrity of AIS and GMDSS functions.  6 It is obvious that the VHF maritime mobile band would be within the candidate frequency band associated with the study. There are some previous and ongoing studies by ITU-R, in respect to technical requirements and identifications, including recommendations and reports, such as:  - Recommendation ITU-R M.1371-5, “Technical characteristics for an automatic identification system using time division multiple access in the VHF maritime mobile frequency band”, 2014;  - Recommendation ITU-R M.585-7, “Assignment and use of identities in the maritime mobile service”, 2015;  - Report ITU-R M.2285-0, “Maritime survivor locating systems and devices (man overboard systems) - An overview of systems and their mode of operation”, 2013;  - Report ITU-R M.2231-1, “Use of Appendix 18 to the Radio Regulations for the maritime mobile service”, 2014;  - WORKING DOCUMENT TOWARDS A DRAFT NEW REPORT ON MMSI FORMATS ITU-R M.[FUTURE MMSI], 2011.  7 In the study of WRC-15 Agenda Item 1.16, it is agreed that for new applications using AIS technology, moving functions of data transmission which is not associated with the core elements of safety of navigation for ships to other frequency bands than AIS1 and AIS2 may benefit the protection of the integrity of GMDSS, AIS VDL, and other emergency purposes.  8 The maritime community has predicted the needs for future new applications or devices. Besides the wide-band frequency band candidate for VHF Data Exchange, WRC-12 designated a new channel 2006 in RR Appendix **18**, and noted that in the maritime mobile service, this frequency is reserved for experimental use for future applications or systems (e.g. new AIS applications, man over board systems, etc.).  9 On the other hand, most of the maritime automated radiocommunication systems, including AIS, DSC, and/or carrying alerting devices of the GMDSS are now assigned maritime mobile service identities (MMSI) according to the most recent version of Recommendation ITU-R M.585. The predictable increasing number of surging maritime new applications and novel devices pushes the urgent needs of study if the existing MMSI scheme is appropriate and capable for the potential huge number of future applications and devices. A task on a new scheme of maritime mobile service identities is ongoing within ITU-R WP5B.  10 In conclusion, it is necessary and urgent to study the possible regulatory requirements, including the potentialfrequency bands and the identify schemes for novel devices globally harmonized for the purpose of protecting the AIS and promoting the safety of navigation.  11 By the study, a category to the existing and future applications and devices using AIS technology would be implemented. Some of reports and/or recommendations would be developed or revised, some of which such as Recommendation ITU-R M.585 is incorporated by reference in Radio Regulations. Provisions and/or Appendix **18** might need revisions to address the issue to ensure the protection of AIS and promoting the safety of navigation. | |
| ***Radiocommunication Services concerned:***  Maritime Mobile Service,Mobile Service | |
| ***Indication of possible difficulties:***  To harmonize the candidate frequency bands for the novel devices, and the development of a new maritime mobile service identities | |
| ***Previous/ongoing studies on the issue:***  Recommendation ITU-R M.1371-5, Recommendation ITU-R M.585-7;  Report ITU-R M.2285-0, Report ITU-R M.2231-1, WORKING DOCUMENT TOWARDS A DRAFT NEW REPORT ON MMSI FORMATS ITU-R M.[FUTURE MMSI] | |
| ***Studies to be carried out by:***  ITU-R SG5 WP 5B | ***with participation of:***  Member States, Sector Members, Academia, and Associates. |
| ***ITU-R Study Groups concerned:***  SG5 | |
| ***ITU resource implications, including financial implications (refer to CV 126):***  ITU-R SG5 WP 5B usually has biannual meetings which last 2 weeks each. | |
| ***Common regional proposal:***  Yes | ***Multicountry Proposal:*** No  ***Number of countries:*** |
| ***Remarks*** | |

ATTACHENT 7

ADD ASP/ xxA24/20

Draft New Resolution [ASP-G10-TRAIN]

**Consideration of spectrum related matters and possible regulatory actions, to support the next generation radiocommunication system between train and tracksides**

The World Radiocommunication Conference (Geneva, 2015),

*considering*

*a)* that the radiocommunication systems between train and tracksides are the core infrastructure to offer the safety-relevant and operational functions for the train control and operations including passenger services;

*b)* that the existing GSM-R is a narrow band radiocommunication system between train and tracksides, which is unable to meet the demands of broadband and high data rate for train safety data transmission, dispatching command, and multimedia applications;

*c)* that some international (such as [UIC](http://www.uic.org/)) or regional organizations (such as [ERA](http://www.era.eu/)) have begun to study new technologies for the next generation radiocommunication system between train and tracksides;

*d)* that ITU-R is conducting studies on train-to-ground communications in the high mobility environment;

*e)* that although radiocommunication systems between train and tracksides are important to ensure safety of the railway transportation, the passengers and their properties, there is no specific radio spectrum management framework in ITU-R for these systems by far;

*f)* that establishing radio spectrum management framework for the next generation radiocommunication system between train and tracksides would be helpful for reducing the difficulty of radio frequency coordination at border areas, promoting the development of industrial chain of railway and cutting down the cost of cross-border railway transportations;

*recognizing*

1. that the deployment of next generation radiocommunication systems between train and tracksides used for train control and operation involves huge infrastructure investment;
2. that the integrated system of train control and operation could be candidate for the next generation radiocommunication system between train and tracksides because of efficient deployment and frequency use;
3. that the frequency band below 1GHz has good radio propagation characteristic, and higher frequency band such as millimetre wave can realize broadband transmission. These bands might be suitable for the next generation radiocommunication between train and tracksides;
4. that some administrations currently use the frequency bands such as 140-150 MHz, 300-470, 700-900MHz for train control and operations including passenger services.
5. that timely compatibility studies for the next generation radiocommunication system between train and tracksides are important and necessary,

*resolves to invite WRC-19*

to consider, based on the results of ITU-R studies, possible regulatory actions to support the next generation radiocommunication system between train and tracksides, while taking into account of protection requirements for systems operating in accordance with existing allocations,

*resolves to invite ITU-R*

to study the working scenarios and spectrum demands for the next generation radiocommunication system between train and tracksides, take into account of the activities of other international and/or regional organizations,

*invites Member States, Sector Members, Academia, and Associates*

to participate actively in the study by submitting contributions to ITU-R.

**Reasons:** A draft new Resolution that supports the proposed WRC-19 agenda item for the next generation radiocommunication system between train and tracksides.

**ANNEX TO ATTACHEMENT 7**

**Subject:** Propose a new agenda item for WRC -19

**Origin:** People's Republic of China

|  |  |
| --- | --- |
| ***Proposal:*** *To set up a new agenda item for WRC-19 to consider spectrum related matters and possible regulatory actions, so as to support the next generation* *radiocommunication system between train and tracksides.* | |
| ***Background/reason:***  1. The train control and operation is the lifeblood of railway transportation and safety. The radiocommunication systems between train and tracksides are core infrastructures for train control and operation including passenger services. Existing systems of such, for example the GSM-R (GSM for Railway) system, mainly provides voice and low speed data applications.  2. In order to meet future demands of train control and operation including passenger services, some international or regional organizations have begun to study new technologies for next generation radiocommunication system between train and tracksides. For instance, ITU-R WP5A is conducting related studies on train-to-ground communications in high mobility environment, including radio propagation characteristic and other key issues. During the 11th ERTMS (The European Railway Traffic Management System) World [Conference](http://ertms-conference2014.com/assets/SESSION-PRESENTATIONS/S7/Evolution-of-the-railways-communication-system-UIC-conf-April-2014PP-CS.pdf) in 2014, International Union of Railways ([UIC](http://www.uic.org/)) released roadmap for the next generation radiocommunication system which aims to offer the safety-relevant and operational functions for the train control. The European Railway Agency (ERA) has completed the assessment to the working plan for the next generation radiocommunication system.  3. The radiocommunication systems between train and tracksides are important to ensure safety of the railway transportation, the passengers and their properties. However, there is no specific spectrum management framework for these systems in ITU-R by far. If the framework could be established globally or regionally, it would be helpful for reducing the difficulty of radio frequency coordination at border areas, promoting the development of industrial chain of railway and cutting down the cost of cross-border railway transportations.  4. In view of this, taking also into account the development and frequency demands of the radiocommunication systems between train and tracksides, China is of the view to set up a new agenda item under for WRC-19 to consider spectrum requirements and possible regulatory actions, so as to support the next generation radiocommunication system between train and tracksides | |
| ***Indication of possible difficulties*:**  Sharing studies between next generation radiocommunication system between train and tracksides used for train control and operation including passenger services and existing mobile communication systems may be required. | |
| ***Previous / ongoing studies on this issue:***  ITU-R WP5Awork report ITU-R M.[RAIL.LINK] | |
| ***Studies to be carried out by:*** ITU-R SG5 | |
| ***ITU-R Study Groups concerned*:** | ***with the participation of:***  Member States, Sector Members, Academia, and Associates. |
| ***ITU resource implications, including financial implications (refer to CV 126):***  ITU-R SG5 usually has meetings once a year. | |
| ***Common regional proposal:***  [Yes] | ***Multicountry Proposal:*** No  ***Number of countries:*** |
| ***Remarks*** | |

**ATTACHMENT 8**

ADD ASP/ xxA24/21

Draft New Resolution [ASP-H10-WPT]

**Studies on spectrum related matters and regulatory actions to support Wireless Power Transmission (WPT)[[2]](#footnote-2)**

The World Radiocommunication Conference (Geneva, 2015)

*considering*

*a)* that wireless power transmission (WPT) is defined as the transmission of power from a power source to an electrical load using electromagnetic field;

*b)* that WPT technologies utilize various mechanisms, such as inductive, resonant and capacitive coupling, etc.;

*c)* that such WPT technologies may be useful in applications of charging of mobile/portable devicesand electric vehicles, etc.;

*d)* that WPT standards are currently being developed at national, regional, and international levels for the above-mentioned wireless charging of mobile devices and electric vehicles, etc.;

*e)* that some administrations recognize that several frequency bands have been investigated for WPT technologies including: 19‑21 kHz and 59‑61 kHz for the shaped magnetic field resonance technology for Electric Vehicles, 79‑90 kHz for magnetic resonant technology for Electric Vehicles, 100‑300 kHz for magnetic resonant and induction technology for mobile devices and 6 765‑6 795 kHz for magnetic resonant technology for mobile devices;

*f*) that as the number of WPT devices grows, the use of WPT technologies may have an impact on the operation of radiocommunication services including the standard frequency and time signal service and the radio astronomy service;

*g*) that radiation outside the bands used by WPT should be minimized in order to protectradiocommunication services;

*h)* that to mitigate the impact of WPT devices on the operation of radiocommunication services, especially those operated in the same frequency bands, some solutions utilize ISM bands,

*noting*

*a)* that the International Electrotechnical Commission (IEC) has published a Technical Report [IEC/TR 62869](https://webstore.iec.ch/preview/info_iec62869%7Bed1.0%7Den.pdf)on Wireless Power Transfer (WPT) for audio, video and multimedia systems and equipment developed by TC 100;

*b)* that the IEC 61980 series, International Standard Organization (ISO) 19363, and the Society of Automotive Engineers (SAE) International J2954 are developing international standards intended for global and regional harmonization on electric vehicle WPT systems;

*c)* thatResolution Global Standards Collaboration (GSC)-17/34 resolves to facilitate strong and effective standards collaboration on WPT in terms of protocol, regulatory and interoperability aspects;

*d)* that Recommendation ITU-R SM.[WPT] will assist administrations in applying No. **15.13** of the Radio Regulations to prevent harmful interference to a radiocommunication servicefrom equipment used for industrial, scientific and medical applications;

*e)* that Rec. ITU-R SM.1056 on the limitation of radiation from industrial, scientific, medical (ISM) equipment recommends that administrations consider the use of the latest edition of CISPR publication 11;

*f)* Report ITU-R SM.2303 ‘Wireless power transmission using technologies other than radio frequency beam’,

*recognizing*

*a)* that the Constitution of the International Telecommunication Union (CS) No, 199 stipulates “Further, the Member States recognize the necessity of taking all practicable steps to prevent the operation of electrical apparatus and installations of all kinds from causing harmful interference to the radio services or communications mentioned in No. 197 above.” and WPT equipment/devices are regarded as included in the ‘electrical apparatus and installations’ mentioned above;

*b)* thatdesignation of appropriate frequency ranges could provide a firm regional or global regulatory basis to avoid harmful interferences from WPT systems to radio services and similarly to other frequency applications for safety purposes.

*c)* that both consumers and manufacturers will benefit from common spectrum bands used for WPT technologies;

*d)* that Industrial, Scientific, Medical (ISM) frequencies have been successfully used in the past for development and proliferation of innovative technologies in accordance with the Radio Regulations;

*e)* the band 6 765-6 795 kHz also designated for ISM use under 5.138 may have advantages for WPT using magnetic resonance technologies in applications of charging of mobile/portable devices;

*f)* that some non-ISM bands are taken into consideration for WPT applications;

*g)* that the wireless power transmission can be treated separately from data communications, especially when the receiving device receives data communications at a different frequency to the power transmission;

*h)* that some Administrations classify the wireless power transmission as an ISM application, even for operation outside bands designated for ISM use under No. **4.4** of the radio Regulations;

*i*) that some Administrations classify WPT as SRD, and operated in bands listed in Recommendation ITU-R SM.1896 and Report ITU-R SM.2153;

*j)* that in the absence of a load, the WPT shuts off and only periodically polls or searches for the load, with very low duty cycle;

*k*) that for WPT the radiated power is much lower than RF power transferred. Most power is transferred to the receiver through mechanisms such as capacitive, resonant and inductive coupling;

*l)* that at VLF, LF and MF frequencies the environment is already very noisy relative to the victim’s thermal noise floor, due to atmospheric and man-made noise;

*m*) that duration or power limits can be placed on WPT,

*resolves to invite WRC-19*

1. to consider spectrum related matters and regulatory actions to support WPT taking into accountthe results of ITU-R studies,

*resolves to invite ITU-R*

1. to continue the study on Question ITU-R 210/1:
   1. Information gathering
2. What applications have been developed for use of WPT technologies?
3. What are the technical characteristics of the emission employed in or incidental to applications using WPT technologies?
4. What is the WPT’s standardization situation in the world?
   1. Study questions
5. Under what category of spectrum use should administrations consider WPT: ISM, or other?
6. What radio frequency bands are most suitable for WPT?
7. What steps are required to ensure that radiocommunication services, including the radio astronomy service, are protected from WPT operations?
   1. Report or Recommendation
8. The results of the above studies should be included in a Report or Recommendation, as appropriate;
9. to complete the study in time for preparation for WRC-19;

*resolves to encourage administrations*

to submit contributions on their assessment of the impact on radio services, based on the studies carried out under this Resolution,

*invites Member States, Sector Members, Academia, and Associates*

to participate in the studies by submitting contributions to ITU-R.

**Reasons:** A draft new Resolution that supports the proposed WRC-19 agenda item for WPT.

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| **ANNEX TO ATTACMENT 8**  **Subject: Proposal of a WRC-19 new agenda item** | |
| **Origin:** Japan | |
| ***Proposal:***  To consider spectrum related matters and regulatory actions to support Wireless Power Transmission (WPT)[[3]](#footnote-3) in accordance with Resolution [ASP/E10/WPT] (WRC-15) | |
| ***Background/reason:***  Technologies to transmit electric power wirelessly have been developed since the 19th century, beginning from the discovery of electromagnetic induction. Since the Massachusetts Institute of Technology succeeded in the innovation on resonant wireless power transmission (WPT) technology in 2006, WPT technologies under development vary widely utilizing various mechanisms such as transmission via magnetic inductive coupling, magnetic resonant coupling, etc.  As some of WPT technologies are practically and commercially available, WPT applications are expanding to mobile and portable devices, home appliances, office equipment, and electric vehicles. Today, WPT technology can remove the restriction on charging device placement on the WPT transmitter. For mobile devices, it also claims simultaneous multiple device charging of different loads (e.g., feature-phones, smartphones, laptops, etc.) on it. Some Standards Development Organizations have already standardized WPT technology specifications for mobile device applications. For electrical passenger vehicles, a heavy and cumbersome charging cable is no longer necessary. Thus, automotive industries regard WPT technology as a promising measure for easier charging of electric vehicles (EV).  So far, Japan has made progress on WPT studies to specify the requirements and specifications for WPT, such as suitable frequencies to attain required transmission power level and power efficiency, and applicable physical dimensions of coil/antenna. We also need further studies to resolve many issues in a timely manner. In particular, the impact of WPT to the radiocommunication services including the standard frequency and time signal service and the radio astronomy service inside and outside of this frequency band to avoid harmful interference.  Some countries and international radio-related organizations are discussing radio regulations necessary to introduce WPT technologies. Some discussion results and ongoing discussions are now publicly available. For example, APT Survey Report on WPT and APT Report on WPT provide the latest information on regulatory discussions in some Asia‑Pacific Telecommunity (APT) member countries. ITU-R SG 1 also has been conducting studies based on Question ITU-R 210/1, “Wireless power transmission” since 1997. In 2014, SG 1 approved Report ITU-R SM.2303-0 “Wireless power transmission using technologies other than radio frequency beam” reflecting contributions from Japan, Korea, APT, etc.  At its meeting in June 2015, considerable discussion took place on frequency ranges for regional or global of operation of WPT based on contributions from Israel, Japan, Korea, and USA. In addition, Japan provided detailed coexisting study results between WPT and other systems. WP 1A of ITU-R SG 1 developed a Preliminary Draft New Recommendation ITU-R SM.[WPT] which recommends a frequency range 6 765-6 795 kHz for magnetic resonant technology for mobile devices, with the intention of seeking its adoption and approval in 2016. Besides, SG 1 approved revision of the Report ITU-R SM. 2303-0 to provide the information and results of studies on the impacts of WPT to incumbent radio systems and other systems such as railway safety systems. Liaison statements were sent to a number of external organizations and Standards Development Organizations, including IEC/CISPR and APT, as well as relevant ITU-R Working Parties, WP 1B, WP 5B, WP 5C, WP 6A, WP 7A and WP 7D, asking for additional information in a timely manner.  It is expected that studies on other frequency ranges will be accelerated in relevant Working Parties, relevant external organizations and Administrations concerned.  The CISPR of IEC sets international standards on measurement and limits of electromagnetic interferences caused by various electric and electronic equipment. The CISPR recently newly added ‘transfer of electromagnetic energy’ in the definition of a group of equipment for its consideration and is progressing its work in cooperation with ITU-R SG 1. The CISPR invites the ITU-R to provide, among others, information concerning frequency ranges for WPT. | |
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| ***Radiocommunication Services concerned:***  Radiocommunication services, including the standard frequency and time signal service and the radio astronomy service | |
| ***Indication of possible difficulties:***  Impact on incumbent radio systems from WPT and requirements on WPT not to cause harmful interferences to incumbent radio systems | |
| ***Previous/ongoing studies on the issue:***  Question ITU-R 210-3/1, PreliminaryDraft New Recommendation ITU-R SM.[WPT] and Report ITU-R SM.2303-1 | |
| ***Studies to be carried out by:***  ITU-R SG 1/WP 1A, WP 1B | ***With participation of:***  Member States, Sector Members, Academia, and Associates and external organizations including IEC/CISPR |
| ***ITU-R Study Groups concerned:***  SG 1 on spectrum requirements and regulatory actions to support WPT and limits on WPT as well as other SGs for protection of radio services | |
| ***ITU resource implications, including financial implications (refer to CV 126):***  This agenda item will be studied within the normal ITU-R procedures and associated budget. No extra cost is foreseen. | |
| ***Common regional proposal:***  Yes | ***Multicountry Proposal:***No  ***Number of countries:*** |
| ***Remarks*** | |

1. It refers to non-beam Wireless Power Transmission technologies. [↑](#footnote-ref-1)
2. It refers to non-beam Wireless Power Transmission technologies [↑](#footnote-ref-2)
3. It refers to non-beam Wireless Power Transmission technologies. [↑](#footnote-ref-3)