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| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Addendum 1 to Document 28(Add.24)-E** |
|  | **30 September 2019** |
|  | **Original: Chinese** |
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| China (People's Republic of) | |
| Proposals for the work of the conference | |
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| Agenda item 10 | |

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.

The Administration of China proposes the following items to be included in the agenda for WRC‑23:

1) To consider possible regulatory actions to support modernization of the Global Maritime Distress and Safety System (GMDSS) and the implementation of e‑navigation.

2) Consideration of regulatory provisions and possible frequency bands for stations on board sub-orbital vehicles.

China also supports the preliminary item 2.3 (space weather sensors) as included in Resolution **810 (WRC-15)** as a WRC-23 agenda item.

Regarding the proposed revision to footnote RR No. **5.522B**, it is recognized that the frequency band 18.6-18.8 GHz is one of the bands utilized extensively for scientific uses, particularly for weather applications. Many passive remote sensing instruments operate in this band and more are planned for future deployment, it is therefore of vital importance to keep this important portion of the spectrum free of harmful interference. Interference affecting spaceborne microwave radiometers in the 18.6-18.8 GHz band has been observed for several years and EESS operators have observed a trend of increasing interference. China is of the view that the existing EESS (passive) should be protected, and the revision of footnote RR No. **5.522B** to enable the use of the 18.6-18.8 GHz band by non-GSO FSS systems with an apogee below 20 000 km could aggravate the interference into the EESS (passive) sensors in the 18.6-18.8 GHz band. Therefore, China opposes to include this issue as a new WRC-23 agenda item.

MOD CHN/28A24A1/1

RESOLUTION 361 (WRC‑19)

Consideration of possible regulatory actions to support modernization of the Global Maritime Distress and Safety System and the implementation of e‑navigation

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

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) is considering GMDSS modernization;

*c)* 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;

*d)* that IMO is considering additional global and regional GMDSS satellite service providers;

*e)* that WRC‑19 will have commenced regulatory actions in regard to modernization of the GMDSS;

*Editor’s note: the considering e) will be modified depending on the decision of WRC-19.*

*f)* that IMO is in the process of implementing 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;

*h)* that the VHF data exchange system (VDES) Ranging-Mode (R-Mode) is under study in the maritime community to support e-navigation, and some maritime administrations may implement VDES R-Mode pilot projects,

noting

*a)* that WRC‑12 reviewed Appendix **17** and Appendix **18** to improve efficiency and introduce frequency bands for new digital technology;

*b)* that WRC‑12 has reviewed the regulatory provisions and spectrum allocations for use by maritime safety systems for ships and ports,

further noting

that WRC‑12, WRC‑15 and this conference have reviewed Appendix **18** to improve efficiency and introduce frequency bands for new digital technology,

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;

*d)* that IMO has received an application to recognize an existing GSO satellite system as a new GMDSS satellite provider, and consequential regulatory actions may need to be considered;

*e)* that the application of VDES R-Mode to support e-navigation may require regulatory actions,

resolves to invite the 2023 World Radiocommunication Conference

1 to consider possible regulatory actions, based on the ITU Radiocommunication Sector (ITU‑R) studies, taking into consideration the activities of IMO, as well as information and requirements provided by IMO, to support GMDSS modernization;

2 to consider possible regulatory actions, including spectrum allocations based on the ITU Radiocommunication Sector (ITU‑R) studies, for the maritime mobile service and the maritime radionavigation service, supporting e‑navigation;

3 to consider regulatory provisions, if any, based on the results of ITU‑R studies referred to in *invites ITU-R* below, to support the introduction of additional satellite systems into the GMDSS,

invites ITU-R

to conduct studies taking into consideration the activities of IMO, in order to determine spectrum needs and regulatory actions to support GMDSS modernization and the implementation of e‑navigation, including the introduction of additional satellite systems into the GMDSS,

invites

1 IMO to actively participate in the studies by providing requirements and information that should be taken into account in ITU‑R studies;

2 the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Civil Aviation Organization (ICAO), 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:** To revise Resolution **361 (WRC-15)** so as to propose a WRC-23 agenda item to conduct studies to support GMDSS modernization, including the introduction of additional satellite systems into GMDSS, and e-navigation.

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| ***Subject:***  To consider possible regulatory actions in support of modernization of the Global Maritime Distress and Safety System (GMDSS) and implementation of e‑navigation. | |
| ***Origin:* China** | |
| ***Proposal:***  To conduct studies and propose possible regulatory actions, taking into consideration the activities of International Maritime Organization (IMO), in order to determine the requirements or regulatory actions to support GMDSS modernization, including the introduction of additional satellite systems into GMDSS, and e-navigation. | |
| ***Background/reason:***  IMO plans to continue the modernization plan for GMDSS and the implementation of e-navigation during the 2020 to 2023 study period.  In parallel to GMDSS modernization, IMO has received an application from China to introduce an additional mobile satellite system into GMDSS. If this satellite system is recognized for use in GMDSS, consequential regulatory actions may need to be considered by ITU.  China proposes a new agenda item for WRC-23 to consider possible regulatory actions in support of IMO’s GMDSS modernization, including the introduction of additional satellite systems into GMDSS, and e-Navigation activities, taking into consideration of IMO’s activities.  Some countries and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) are developing Ranging-Mode (R-Mode) for use in the maritime VHF bands which is a ground-based radionavigation system intended to provide a contingency system in case of temporary disruption of GNSS, to support e-navigation. | |
| ***Radiocommunication Services concerned:***  Mobile service, fixed service, radio astronomy service, radiodetermination-satellite service, mobile satellite service, aeronautical radionavigation service | |
| ***Indication of possible difficulties:***  The proposed bands are widely used by the terrestrial and space services on a co-primary basis. | |
| ***Previous/ongoing studies on the issue:***  WRC‑19 has commenced regulatory actions in regard to the modernization of GMDSS. | |
| ***Studies to be carried out by:***  ITU-R WP 5B and WP 4C | ***with participation of:***  Administrations and Sector members of the ITU‑R*, IMO, IALA, IMSO* |
| ***ITU-R Study Groups concerned:***  Study Groups 4 and 5, and other groups | |
| ***ITU resource implications, including financial implications (refer to CV 126):***  This proposed agenda item will be studied within the normal ITU-R procedures and planned budget. | |
| ***Common regional proposal:***  No | ***Multicountry Proposal: No***  ***Number of countries:*** |
| ***Remarks*** | |

ADD CHN/28A24A1/2

Draft New Resolution [CHN-DRAFT NEW RESOLUTION [SUB‑ORBITAL]] (WRC-19)

Consideration of regulatory provisions and possible frequency bands  
 for stations on board sub-orbital vehicles

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

considering

*a)* that 100 kilometres from the Earth’s surface could be considered as the boundary between the Earth’s atmosphere and space;

*b)* that some vehicles, including aircraft, can fly at altitudes over 100 km and operate in sub-orbital trajectories;

*c)* that other vehicles may also operate at altitudes over 100 km and use non-orbital trajectories;

*d)* that sub-orbital flight can be defined as the intentional flight of a vehicle expected to reach the upper atmosphere with a portion of its flight path that may occur in space without completing a full orbit around the Earth before returning to the surface of the Earth;

*e)* that sub-orbital vehicles may perform various missions (e.g. deploying a space vehicle, conducting scientific research, or providing transportation) and then return to the Earth’s surface without completing a full orbital flight around the Earth;

*f)* that sub-orbital vehicles should safely share airspace with conventional aircraft during their transition to and from high altitude, including those returning from space;

*g)* that stations on board sub-orbital vehicles may use frequencies allocated to space and terrestrial services for the purpose of telemetry, tracking and command (TT&C), voice/data communications, navigation, surveillance, and safety of life and property,

recognizing

*a)* that there is no internationally agreed legal demarcation between the Earth’s atmosphere and the space domain;

*b)* that the current regulatory provisions for terrestrial and space services may not be adequate for international recognition of the use of relevant frequency assignments by stations on board sub-orbital vehicles,

noting

*a)* ITU‑R Report M.[SUBORBITAL VEHICLES] provides information on the current understanding of radiocommunications for sub-orbital vehicles including a description of the flight trajectory, categories of sub-orbital vehicles, technical studies related to possible avionics systems used by sub-orbital vehicles, and service allocations of those systems;

*b)* that provisions of No. **4.10** may apply to certain aspects of these operations,

resolves to invite the 2023 World Radiocommunication Conference

to take appropriate actions, based on the results of ITU-R studies, for the implementation of stations on board sub-orbital vehicles,

resolves to invite the ITU Radiocommunication Sector

1 to study spectrum needs for communications between stations on board sub-orbital vehicles and terrestrial and space stations providing functions, *inter alia*, voice/data communications, navigation, surveillance, telemetry, tracking and command (TT&C) and safety of life and property;

2 to study appropriate modification to the existing provisions to accommodate stations on board sub-orbital vehicles;

3 to conduct sharing and compatibility studies with incumbent services which have primary allocations in the same and adjacent frequency bands to avoid harmful interference, with regard to the sub-orbital flight application scenarios,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R,

instructs the Secretary-General

to bring this Resolution to the attention of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and International Civil Aviation Organization (ICAO) and other international and regional organizations concerned.

**Reasons:** This new Resolution proposes a WRC-23 agenda item to conduct studies for the development and implementation of stations on board sub-orbital vehicles.

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| ***Subject:*** To consider operational, technical and regulatory issues for stations on board sub-orbital vehicles. | |
| ***Origin:* China** | |
| ***Proposal:***  To identify the status of stations on board sub-orbital vehicles;  To conduct studies to determine spectrum needs for communications between stations on board sub-orbital vehicles and terrestrial and space stations providing voice/data communications, navigation, surveillance, telemetry, tracking and command (TT&C), safety of life and property, and so on;  To conduct studies to classify appropriate radiocommunication services and identify frequency bands to stations on board sub-orbital vehicles;  To conduct sharing and compatibility studies to avoid harmful interference between radiocommunication services regarding the sub-orbital flight application scenarios. | |
| ***Background/reason:***  With the increasing maturity of launch technologies, significantly improving success rate of reusable launching technologies and the innovating space transportation systems, the application prospect of sub-orbital flight is getting much wider. However, it needs to be studied in many aspects, such as definitions, the demarcation between atmosphere and space, flight modes, tracking and control, safety assurance and so on. Radiocommunication plays a crucial role in every major phases of sub-orbital flights.  ITU-R calls for studies to meet the needs of radio applications for stations on board sub-orbital vehicles in accordance with Resolution **763** (**WRC-15**), which was identified as issue 9.1.4.  ITU-R studies suggest that, further operational, technical and regulatory issues may need to be addressed, which require continuing studies, on the status of stations on board sub-orbital vehicles and types of applications, through the appropriate mechanism and on the potential interference to be considered with regard to radiocommunication systems operating on sub-orbital vehicles. | |
| ***Radiocommunication Services concerned:***  Space operation service, space research service, mobile-satellite service, inter-satellite service, aeronautical mobile service, aeronautical mobile-satellite service, radionavigation-satellite service | |
| ***Indication of possible difficulties:***  Identification of the status of stations on board sub-orbital vehicles.  Sharing and compatibility studies with incumbent services with regard to the sub-orbital flight application scenarios. | |
| ***Previous/ongoing studies on the issue:***  ITU-R WP 5B，as the responsible group for issue 9.1.4, has carried out studies on issues of sub-orbital flight, sub-orbital vehicles and stations on board sub-orbital vehicles, etc., and developed a preliminary draft new Report ITU-R M.[SUBORBITAL VEHICLES], “Radiocommunications for Sub-orbital Vehicles”, approved by SG 5 meeting in September, 2019. The Report provides various definitions relative to sub-orbital vehicles and descriptions of sub-orbital flight, and identifies planned development that may require radio stations on board sub-orbital vehicles to use frequencies allocated to space and terrestrial services for the purpose of voice/data communications, navigation, surveillance, telemetry, tracking and command (TT&C), and safety of life and property. This Report also provides a Doppler shift and link budget analysis for current aeronautical systems that may be used on sub-orbital vehicles, sub-orbital flight phases and selection of radiocommunication spectrum and so on. | |
| ***Studies to be carried out by:***  ITU-R Working Party 5B | ***with participation of:***  the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and International Civil Aviation Organization (ICAO) and other international and regional organizations concerned |
| ***ITU-R Study Groups concerned:***  SG4, SG5, SG7 | |
| ***ITU resource implications, including financial implications (refer to CV 126):***  This proposed agenda item will be studied within the normal ITU-R procedures and planned budget. | |
| ***Common regional proposal:***  No | ***Multicountry Proposal:*** No  ***Number of countries:*** |
| ***Remarks*** | |

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