**United States**

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.

**Background**

WRC-15 adopted Resolution **763** (**WRC 15**) to deal with stations on board suborbital vehicles. It was resolved to conduct studies during the WRC-19 study cycle:

* to identify any required technical and operational measures, in relation to stations on-board suborbital vehicles, that could assist in avoiding harmful interference between radiocommunication services.
* to determine spectrum requirements and, based on the outcome of those studies, to consider a possible future agenda item for WRC-23.

Further, in 2015that the ITU-R formulated Question ITU-R 259/5, "Operational and radio regulatory aspects for planes operating in the upper level of the atmosphere." Studies in the framework of that Question are related to Resolution **763 (WRC-15)**. In particular, decides 3 of the Question asks, "What radio links will be required to support space planes’ operations and under what radiocommunication service definition will they fall?"

There are planned developments for sub-orbital flight based on various types of technologies and vehicles. The approaches vary between those using a single vehicle and those that use a launch vehicle that carries the spacecraft up to an intermediate height before releasing the spacecraft to accelerate away and into a suborbital spaceflight.

The ITU-R performed technical and operational analyses of stations on-board suborbital vehicles including:

* an evaluation of the regulatory provisions that may require additions or modifications; and
* identification of the potential need for spectrum to support communications and surveillance in space, without changing the existing use of the space operations service.

In addition, the analyses examined link budgets and Doppler shift for suborbital vehicles using existing ICAO standardized radiocommunication systems and technologies. The studies concluded, while no new spectrum allocations are necessary, a WRC-23 agenda item is necessary to modify definitions to ease introducing sub-orbital vehicles communications

**Proposals**

ADD TBD/XXX/1

Draft New Resolution [xxx] (WRC-19)

**Agenda for the 2023 World Radiocommunication Conference**

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

...

**X.X1**  to consider, in accordance with Resolution [YYY] (WRC-19), regulatory provisions to facilitate communications to sub-orbital vehicles.

Reasons: To allow revisions to the Radio Regulations, to provide regulations for communications to sub-orbital vehicles and to facilitate the safe integration of sub-orbital vehicles into the existing air traffic management system.

ADD TBD/XXX/2

Draft New Resolution [yyy] (WRC-19)

**Radiocommunications for Sub-Orbital Vehicles**

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

*considering*

1. that there are aircraft being developed to operate from the ground to an altitude considered to be outer space and return to earth within one earth rotation;
2. that there is a need to ensure equipment installed on such aircraft can communicate safely with air traffic management systems without causing harmful interference to radiocommunication used for safety purposes on other vehicles;
3. that the ITU has been referring to these aircraft as “sub-orbital vehicles,” but such use of aircraft are not defined in the radio regulations; that there is no internationally agreed boundary between the Earth’s atmosphere and the space domain.;
4. that radiocommunication between sub-orbital vehicles and air traffic management are required throughout the entire flight;
5. that vehicles flying at the boundary of space and the atmosphere or re-entering the atmosphere may generate a plasma sheath that may envelop all or most of the vehicle;
6. that the plasma sheath attenuation does not allow for radiocommunications directly to the ground to pass through;

*recognizing*

1. that Annex 10 to the Convention on International Civil Aviation contains SARPs for aeronautical radionavigation and radiocommunication systems used by international civil aviation;
2. that suborbital vehicles will use both space and terrestrial stations;
3. that suborbital vehicles can communicate with space and terrestrial stations under existing space and terrestrial service allocations;

*noting*

1. that the development of compatibility criteria between ICAO-standardized aeronautical systems is the responsibility of ICAO,

*resolves to invite the 2023 World Radiocommunication Conference*

to consider the results of studies in accordance with Resolution [YYY], and take appropriate regulatory actions but excluding any changes to ITU Radio Regulation Article 5 – Frequency Allocations or imposing additional constraints on other services.

*invites ITU-R*

to conduct studies on and identify, in time for WRC-23, any revisions to the Radio Regulations to facilitate communications for the safe operation of sub-orbital vehicles. Those studies should be conducted in close coordination with the International Civil Aviation Organization and may include defining a sub-orbital vehicle, or sub-orbital vehicle station class, while considering appropriate radiocommunication services for flight safety applications related to interoperability with international civil aviation;

*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 ICAO.

**Reasons:** A resolution will support the ITU-R studies needed under the relevant WRC-23 agenda item.