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| CPG19-5 |
| Budapest, Hungary, 08th - 11th January 2018 |
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| Subject:  | Draft CEPT Brief on WRC-19 Agenda Item 9.1 issue 9.1.4 |
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| Summary:  |
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| Proposal: |
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1. The following pages are intended to be compiled in one CEPT Brief on AI 9

DRAFT CEPT BRIEF ON AGENDA ITEM 9.1 issue 9.1.4

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

Issue 9.1.4 Resolution 763 – Stations on board sub-orbital vehicles

# ISSUE

Resolution 763 resolves to invite the ITU Radiocommunication Sector

1. to conduct studies to identify any required technical and operational measures, in relation to stations on board sub-orbital vehicles, that could assist in avoiding harmful interference between radiocommunication services;
2. to conduct studies to determine spectrum requirements and, based on the outcome of those studies, to consider a possible future Agenda item for WRC-23;
3. to complete the studies within the next ITU Radiocommunication Sector (ITU-R) study cycle,

# Preliminary CEPT position

CEPT is of the view that:

* the ITU-R studies called for by Resolution 763 should be supported;
* based on the results of those studies, what action is to be taken should be determined;
* stations on board suborbital vehicles shall not cause harmful interference nor impose additional constraints on systems operating under the incumbent services.
* suborbital vehicles need to be differentiated from current satellite launch vehicles

# Background

Space planes or sub-orbital vehicles have been discussed at a conceptual level for some time. However, with the advances in technology, the first re-useable space vehicle that can routinely take off and land on a traditional runway is close to becoming a reality with a number of companies either close to or actually testing vehicles.

A suborbital space flight can be seen as a flight in which the vehicle reaches space, without being able to complete an entire revolution of the Earth, and having the intent to land on Earth.It is envisaged that such vehicles might be the precursor to hypersonic travel that ultimately could cut the time taken to travel from Europe to Australia from approximately 24 hours to 90 minutes.

Further, such vehicles could also offer an alternative means of launching satellites. However, these satellites would need an additional propulsion system in order to reach the corresponding altitude for their insertion into the relevant orbit.

The introduction of such vehicles will bring a number of challenges to the spectrum and frequency management communities. With respect to spectrum, a sub-orbital space vehicle will travel at, or reach, an altitude beyond 100 km, which is generally taken as the boundary between the Earth’s atmosphere and space. Hence, stations on board sub-orbital vehicles, since they are designed to go beyond the major portion of the earth’s atmosphere, may not necessarily be able to be regarded as terrestrial stations. However, since these vehicles are not envisaged to establish an orbital trajectory, stations on board cannot be considered as space stations located on a satellite. As a result, it is not clear what radio service(s) would be appropriate. From a frequency management perspective, planning rules for stations on board sub-orbital vehicles need to take into account that their field of view is significantly greater and their speed will produce higher levels of Doppler shift than that of an equivalent station on board an aircraft flying at an altitude around 35,000 ft.

Studies are therefore required to establish a common understanding as to how stations on board sub-orbital vehicles should be regarded in radio regulatory terms and whether a new category of service or station needs to be established. Furthermore, studies are needed to determine what spectrum will be required to ensure their safe operation, including their passage through the airspace used by conventional aircraft. Resolution 763 (WRC-15) calls for such studies and, if the results indicate that additional spectrum and/or other regulatory measures are required, provides for a possible WRC-23 agenda item.

This issue in the Director’s report arose from consideration of ITU-R Question 259/5 on Operational and radio regulatory aspects for planes operating in the upper level of the atmosphere. In order to address the Question and also this related Director’s Report Issue, WP5B is producing a Report (the current version is in document 5B/305 Annex 25) addressing spectrum, regulatory and operational aspects of sub-orbital vehicles.

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

* ITU-R Question 259/5
* Annex 25 to Working document towards a preliminary draft new Report ITU-R M.[SUBORBITAL VEHICLES] Spectrum requirements for suborbital vehicles (WP 5B Chairman's Report on the meeting in May 2017, Doc. 5B/305).

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

EU Documentation (Directives, Decisions, Recommendations, other), if applicable

# Actions to be taken

* Establish a common understanding as to how stations on board sub-orbital vehicles should be regarded in radio regulatory terms and whether a new category of service or station needs to be established
* Based on the above, analyse the possible usage of the existing frequency allocations for terrestrial and space radio communication services and the corresponding regulation provisions for stations on board suborbital vehicles.

# Relevant information from outside CEPT (examples of these are below)

## European Union (date of proposal)

## Regional telecommunication organisations

APT (July 2017)

APT Preliminary View

APT Members support the ITU-R studies in accordance with Resolution 763 (WRC-15).

ATU (date of proposal)

Arab Group (April 2017)

Support following-up on-going studies in ITU-R.

CITEL (December 2017)

Preliminary Views

CANADA & USA

To support studies called for by Resolution 763 (WRC-15), noting that those studies need to be completed during this study cycle. Based on the outcome of those studies, consider a possible future agenda item for WRC-23.

CANADA

Canada is of the view that existing station and service definitions in Article 1 of the Radio Regulations can be applied to sub-orbital vehicles (space planes).

RCC (September 2017)

The RCC Administrations are in favour of identification of services where stations ensuring sub-orbital flights shall be operated, as well as consideration of applicability of current regulatory provisions and procedures for terrestrial and space services for international recognition of relevant frequency assignments to stations on board sub-orbital vehicles.

The RCC Administrations consider it necessary to develop technical and operational measures which would help to avoid harmful interference to radiocommunication services from stations on board sub-orbital vehicles. These technical and operational measures shall be specified in the new ITU-R Recommendation and Report. At the same time, the developed technical and operational measures shall not impose additional constraints on the operation of stations used during spacecraft launch and delivery in orbit.

## International organisations

IATA (date of proposal)

ICAO (September 2016)

To support the studies called for by Resolution 763 (WRC-15) noting that those studies need to be completed during this study cycle.

If the results of studies indicate that additional spectrum and/or other regulatory measures are required, seek an agenda item for WRC-23.

IMO (September 2017)

No Position

SFCG (December 2016)

SFCG members will continue to monitor the developments of this agenda item in WP 5B for any spectrum requirements identified that could impact space science service operations.

It is important that any regulatory changes associated with this agenda item will not adversely impact the operation of launch vehicles or sounding rockets. Launch vehicle operations during the first minutes of low orbit must not be limited beyond the current regulations.

WMO and EUMETNET (date of proposal)

**IARU (June 2017)**

This issue is of concern to the IARU only if spectrum requirements for space planes are identified that are in addition to the existing allocations for aeronautical and space operation services and if, therefore, a possible future agenda item for WRC-23 is developed.

## Regional organisations

ESA (date of proposal)

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (date of proposal)

GSMA (date of proposal)

CRAF (date of proposal)

**NATO**

**NMA (**December **2017)**

There is a potential impact of the AI to the NATO military operations

NATO Position

No position at this stage