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| **40 MEETING OF PERMANENT**  **CONSULTATIVE COMMITTEE II:**  **RADIOCOMMUNICATIONS**  **October 31 to November 04, 2022**  **Port of Spain, Trinidad and Tobago** | | **OEA/Ser.L/XVII.4.2.39**  **CCP.II-RADIO /doc. /22**  **6 October 2022**  **Original: English** |
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|  | **DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE**  **AGENDA ITEM 1.6** | |
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|  | **(Item on the Agenda: 3.1)**  **(Document submitted by the United States of America)** | |

**Impact on the sector:**

This document supports the CITEL PCCII WRC Working Group’s preparations for WRC-23.

**Executive Summary:**

This document contains a preliminary proposal from the United States for WRC-23 agenda item 1.6 addressing sub-orbital vehicles.

**UNITED STATES OF AMERICA**

**DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE**

**AGENDA ITEM 1.6**: *to consider, in accordance with Resolution* ***772 (WRC-19)****, regulatory provisions to facilitate radiocommunications for sub-orbital vehicles;*

Stations on board sub-orbital vehicles have a need for voice/data communications, navigation, surveillance, and telemetry and tracking and command (TT&C) applications to safely and effectively complete various mission requirements

**BACKGROUND INFORMATION**:

WRC-19 recognized that stations on board sub-orbital vehicles may use systems operating under space and/or terrestrial services, and that the current regulatory provisions and procedures for terrestrial and space services may not be adequate for international use of relevant frequency assignments by stations on board suborbital vehicles. Some inconsistencies were raised during the preparations for WRC-23 agenda item 1.6, between the operational use of stations on-board suborbital vehicles, and the definitions of *terrestrial stations* in RR No **1.62**, *earth stations* in RR No **1.63**, and *space stations* in RR No **1.64**. Radio stations operating on-board suborbital vehicles are currently, and expected in the future, to operate both in frequency bands currently allocated for terrestrial radiocommunication services, and those allocated for space radiocommunication services. While in the RRs, each station shall be classified by the service in which it operates permanently or temporarily (RR No. **1.61)**, the suborbital vehicle may be physically located within the major portion of Earth’s atmosphere or beyond for a brief period of time, but the physical location of the suborbital vehicle on which the stations are located does not necessarily change the need for, or purpose of, the use of specific radiocommunication services.

In accordance with RR No. **1.64,** there are no difficulties with the existing RR Article 5 allocations when a *space station* on-board suborbital vehicle goes beyond or is intended to go beyonda major portion of the Earth’s atmosphere, based on the space radiocommunication service in which the station operates. This proposal considers that terrestrial and Earth stations onboard the suborbital vehicle do not become a *space station* but are considered terrestrial stations or Earth stations for the entire flight.

A *terrestrial station* is defined as, “a station effecting *terrestrial radiocommunication,*” and *terrestrial radiocommunication* (RR No. **1.7**) is defined as, “any radiocommunication other than *space radiocommunication* or *radio astronomy*”. Under RR No. **1.61**, each station shall be classified by the service in which it operates permanently or temporarily. While the suborbital vehicle is physically located beyond the major portion of the Earth’s atmosphere for a brief period of time, the physical location of the suborbital vehicle on which the stations are located does not change the need for, or purpose of the use of specific radiocommunication applications.

One objective of *Resolution* ***772 (WRC-19)*** is to facilitate radiocommunications necessary to safely integrate suborbital vehicles into the same airspace as conventional aircraft during their transition to and from space in order to minimize the airspace disruption. Studies found in Report ITU-R M.2477 show that suborbital vehicle activity requires making unavailable large areas of international and national airspace. This results in airspace disruptions, extra travel time, re-routing flight paths, and additional aircraft fuel consumption. The report shows the feasibility of using existing aircraft avionics systems by suborbital vehicles without modification of the existing Article 5 RR provisions. A WRC Resolutionis proposedto clarify the use and classification of stations necessary for the safe and efficient operation of suborbital vehicles.

**Proposal**

ADD USA/A1.6/1

RESOLUTION [Sov] (WRC-23)

**Use of and Classification of Stations On-board Suborbital Vehicles**

The World Radiocommunication Conference (Dubai, 2023),

*considering*

*a)* that sub-orbital vehicles operate at higher altitudes than conventional aircraft, with a sub-orbital trajectory;

*b)* that sub-orbital vehicles operate through the lower levels of the atmosphere, where they may operate in the same airspace as conventional aircraft;

*c)* that sub-orbital vehicles may perform various missions such as conducting scientific research or providing transportation;

*d)* that stations on board sub-orbital vehicles are to accommodate all or some of the following applications: voice/data communications, navigation, surveillance, and telemetry, tracking and command (TT&C), and may use systems operating in the Aeronautical Radionavigation Service (ARNS); Aeronautical Mobile (Route) Service (AM(R)S); Mobile Satellite Service (MSS); Radionavigation Satellite Service (RNSS); and, Aeronautical Mobile Satellite (Route) Service (AMS(R)S);;

*e)* that sub-orbital vehicles must be safely integrated into airspace used by conventional aircraft;

*f)* that some stations onboard sub-orbital vehicles may need to communicate with air traffic management systems and relevant ground control facilities;

*h)* that orbital satellite launch rocket systems or components may be considered as a sub-orbital vehicles;

*recognizing*

*a)* that some sub-orbital flights could reach altitudes for a brief period of time in space without sufficient energy to sustain permanent orbit;

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

*c)* that stations on-board sub-orbital vehicles may use systems operating under space or terrestrial services;

*d)* that Annex 10 to the Convention on International Civil Aviation contains Standards and Recommended Practices (SARPs) for aeronautical radionavigation and radiocommunication systems used by international civil aviation;

*noting*

*a)* that Report ITU-R M.2477 defines sub-orbital flight as an 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 back to the surface of the Earth;

*b)* that Report ITU-R M.2477 defines a sub-orbital vehicle as a vehicle executing sub-orbital flight;

*c)* that Report ITU-RM.2477 provides information on 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;

*e)* that the provisions of No. **4.10** may apply to certain aspects of sub-orbital vehicle operations;

*f)* that the development of compatibility criteria between International Civil Aviation Organization (ICAO) standardized aeronautical systems is the responsibility of ICAO;

*resolves*

1 that stations on-board suborbital vehicles may include terrestrial stations (RR No. 1.62) or earth stations (RR No. 1.63), or both, and those stations are used in all phases of flight, without change to classification, within their respective service allocations,

2 that the stations on board sub-orbital vehicles shall not create new constraints on applications of the same service and on other radiocommunication services that are allocated on a primary basis in the same and adjacent frequency bands.

*instructs the Secretary-General*

to bring this Resolution to the attention of ICAO.

*invites the International Civil Aviation Organization*

to take into account this Resolution and relevant portions of Report ITU-R M.2477 in the course of developing SARPs for ICAO systems that may be used by sub-orbital vehicles.

**Reasons:** This action will clarify that stations on-board sub-orbital vehicles may terrestrial stations (RR No. **1.62**) and earth stations (RR No. **1.63**) and can be used in all phases of flight, within their respective service allocations. The stations shall not impose any new constraints on applications of the same service and other radiocommunication services that are allocated on a primary basis.

SUP USA/A1.6/2

RESOLUTION 772 (WRC-19)

**Consideration of regulatory provisions to facilitate**

**the introduction of sub orbital vehicles**

**Reasons:** This resolution may be suppressed by WRC-23 because of a decision to add a new WRC Resolution clarifying the use of frequencies on-board suborbital vehicles.