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|  | **PROPOSALS FOR THE WORK OF THE CONFERENCE**  **AGENDA ITEM 9.1 Topic D** | |  |
|  | **(Item on the Agenda: 3.1 (SGT-5))** | |  |
|  | **(Document submitted by the administration of the United States of America)** | |  |

**Impact on the sector:**

This document supports the work of CITEL’s PCC.II Working Group for WRC under 3.1 of the agenda.

**Executive Summary:**

This contribution is in relation to WRC-23 agenda item 9.1 Topic D. The United States proposes that a No Change to the Radio Regulations should be made under Agenda item 9.1 Topic D noting that ITU-R studies indicated that the EESS passive operation in 36-37 GHz is sufficiently protected and no additional measures are needed.

**UNITED STATES OF AMERICA**

**PROPOSALS FOR THE WORK OF THE CONFERENCE**

**AGENDA ITEM 9.1 Topic D**: to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the ITU Convention on the activities of the ITU Radiocommunication Sector since WRC-19:

* Protection of EESS (passive) in the frequency band 36-37 GHz from non-GSO FSS space stations operating in the frequency band 37.5-38 GHz (space-to-Earth);

**BACKGROUND:** The 36-37 GHz band is used by passive sensor missions. Measurements taken in this band augment weather forecasting, climatological, and topographic capabilities through the estimation of properties of rain rate, snow and sea ice morphology, lake ice, snow water content, and oil slicks.

During WRC-19, a number of studies were conducted by the ITU-R Agenda Item 1.6 In majority of cases these studies indicated that EESS passive in 36-37 GHz is sufficiently protected, mainly because of having 500 MHz guard band; However, the operation of some very low earth orbit non-GSO system showed mitigation were required in order to limit the impact on the EESS passive.

WRC-19 decided upon the creation of a regulatory framework for non-GSO FSS operation in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space), and 50.4-51.4 GHz (Earth-to-space) under Agenda Item 1.6, without requiring measures to protect EESS passive in 36-37 GHz band.

Because this work falls under Agenda Item 9.1, WRC-23 should take no regulatory action. Furthermore, it was agreed by WRC-19 that no modifications to Resolution **750 (Rev WRC-19)** are to be considered under these studies since the frequency band 36-37 GHz is not referenced in No. **5.340**.

**SUMMARY OF THE STUDIES:**

Two additional areas of study were required as a consequence of the WRC-19 Agenda Item 1.6 decision.

• interference from non-GSO FSS systems at lower orbit into EESS passive sensors operating at higher orbits

• interference from non-GSO FSS systems at higher orbit into the cold sky calibration of EESS passive sensor operating at lower orbits

With regard to the first scenario, interference from non-GSO FSS systems at lower orbit into EESS passive satellites at higher orbits, the results of one study considering two different non-GSO FSS systems indicate that an unwanted emission power density limit of −31 dBW/100 MHz in the frequency band 36-37 GHz would be needed. This would be applicable to non-GSO FSS constellations operating at altitudes below 970 km (maximum altitude of EESS (passive) sensors in this frequency band). The results of another study considering one non-GSO FSS system show that there is a minimum positive margin of 10-15 dB to the EESS (passive) protection criteria. Both studies that indicated additional protections would be necessary considered a side lobe level of 0 dBi, no additional satellite body blockage loss, and no apportionment of the EESS (passive) protection criterion. When considering characteristics of satellite systems, all studies conclude that no specific unwanted emission limit would be needed to cover this scenario.

With regard to the second scenario, interference from non-GSO FSS systems at higher orbit into EESS passive satellites at lower orbits, the results of two studies considering three different non-GSO FSS systems indicate that an unwanted emission power density limit of −31 dBW/100 MHz in the frequency band 36-37 GHz would be needed, without apportionment of the EESS (passive) protection criterion. This would be applicable to non‑GSO FSS constellations operating at altitudes above 407 km (minimum altitude of EESS (passive) sensors in this frequency band) and below 2 000 km (limited to LEO constellations). Another study that considers a different set of operational FSS characteristics has shown that there is a minimum margin of approximately 7 dB to the EESS (passive) protection criteria when only assessing interference from the particular constellation considered, and this study concludes that no specific unwanted emission limit would be needed to cover this scenario.

The result of the ITU-R studies on the first scenario indicates that the EESS passive operation in 36-37 GHz is sufficiently protected and no additional measures is needed. The studies related to the second scenario did not produce converging results and one study showed that taking into account operational characteristics of NGSO systems, the compliance with the out-of-band mask in ITU-R Recommendation SM.1541 showed that EESS Passive was protected.

**Proposal:**

**NOC** USA/9.1-D/1

**ARTICLES**

**NOC** USA/9.1-D/2

**APPENDICES**

**NOC** USA/9.1-D/3

**RESOLUTIONS AND RECOMMENDATIONS**

**Reason:** The United States is of the view that regulatory changes to the Radio Regulations are outside the scope of Agenda Item 9.1. Furthermore, the United States notes that neither studies during the WRC-19 study cycle under Agenda Item 1.6 nor the updated WRC-23 studies under this topic have demonstrated with certainty that EESS (passive) in 36-37 GHz requires any additional protection from non-GSO FSS operation in 37.5-38 GHz. As such, the United States supports No Change (NOC) to the Radio Regulations for agenda item 9.1 Topic D.

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