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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 21 to Document 92-E** |
|  | **7 October 2019** |
|  | **Original: English** |
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| India (Republic of) | |
| Proposals for the work of the conference | |
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| Agenda item 9.1 | |

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

9.1 on the activities of the Radiocommunication Sector since WRC-15;

Background

The Director of the Radiocommunication Bureau has provided his Report on the activities of the Radiocommunication Sector since WRC-15 under WRC-19 agenda item 9 in WRC-19 Document 4.

The interference to MSS in the frequency band 2 500-2 520 paired with 2 670-2690 MHz is included in Annex-2 of Part-1 of this Report of the Director (Addendum 1 to WRC-19 Doc. 4), under section 2, Cases of Harmful Interference affecting Space Services reported to the Bureau. The text is as under:

“Two GSO satellite networks have experienced harmful interference affecting their uplinks in the frequency band 2 670-2 690 MHz since 2016. Measurements and analysis provided by the affected administration conclude that interference is the result of the aggregation of LTE signals radiated from a large number of terrestrial LTE base stations. Annex 9 to Document 4C/472 refer to this case of interference.”

The BR Director's Report to RA-19 also includes this reported interference in section 2 of Annex 1.

Besides interference in the frequency band 2 670-2 690 MHz (Earth-to-Space), the Indian administration is also experiencing harmful interference in the adjoining frequency band of 2 655-2 670 MHz. Further details of the case are given below.

**Introduction**

Frequency band 2 670-2 690 MHz (Earth-to-Space) is allocated on a primary basis for the mobile-satellite service, and the band 2 655-2 670 MHz (Earth-to-Space) is also allocated for the mobile-satellite service except aeronautical mobile-satellite service for operation limited to within national boundaries in accordance with No. **5.420** of the Radio Regulations (RR).

In accordance with RR No. **5.384A**, the frequency band 2 500-2 690 MHz or portions thereof, are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution **223 (Rev.WRC‑15)**. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations.

However, Resolution **225 (Rev.WRC-12**) recognizes “that studies of potential sharing and coordination between the satellite component of IMT and the terrestrial component of IMT, mobile-satellite service applications and other high-density applications in other services such as point-to-multipoint communication/distribution systems in the bands 2 500-2 520 MHz and 2 670-2 690 MHz bands are not finished”. This situation remains unchanged till date.

Meanwhile, deployment of terrestrial component of IMT systems in the bands 2 500-2 690 MHz have proliferated, while the studies on potential for sharing and putting in place a coordination mechanism between the mobile-satellite service and the terrestrial component of IMT have not been completed. The Administration of India has experienced harmful interferences into its mobile-satellite service networks, operational for more than three decades, in the frequency band 2 670-2 690 MHz due to the aggregate emissions from the terrestrial IMT systems operational in the regions beyond the service area of such mobile-satellite service networks, and the same have been reported to ITU.

The interference to MSS in this frequency band is also included in Annex-2 of Part-1 of the Report of the Director BR on the activities of the radiocommunication sector to WRC-19 under section 2, *Cases of Harmful Interference affecting Space Services reported to the Bureau.* The BR Director's report to RA-19 also includes this reported interference in section 2 of the Annex-1. The text is as under:

“*Two GSO satellite networks have experienced harmful interference affecting their uplinks in the frequency band 2 670-2 690 MHz since 2016. Measurements and analysis provided by the affected administration conclude that interference is the result of the aggregation of LTE signals radiated from a large number of terrestrial LTE base stations. Annex 9 to Document 4C/472 refers to this case of interference*.”

The demand has been increasing for the use of mobile satellite services for a wide range of telecommunication applications. International Mobile Telecommunication systems are also characterized by increasing demand and rapid deployment of terminals with ubiquitous presence. Both, mobile-satellite service and International Mobile Telecommunications (IMT), are important and needed in equal measure.

Resolution **225 (Rev.WRC-12**) also invites ITU-R to study the sharing and coordination issues in the above bands related to use of the mobile-satellite service allocations for the satellite component of IMT and the use of this spectrum by the other allocated services, including the radiodetermination-satellite service. However, no significant progress has been made to complete such sharing studies in last study cycles.

Working Party 4C, in its twenty second meeting (Geneva, 19-25 June 2019), discussed the Indian contribution (Document 4C/461) on the protection of the mobile-satellite service from interference due to operation of terrestrial IMT systems in the band 2 670-2 690 MHz. WP4C then prepared the Working Document on ‘Sharing and coexistence studies between the mobile-satellite service and terrestrial IMT systems in the 2 655-2 690 MHz frequency band’ that is included in the Working Party 4C Chairman’s Report as Annex 9 (Annex 9 to Document 4C/472).

The sharing studies are not completed since Resolution **225** was adopted (in WRC-2000), and Indian operational MSS satellites are affected by harmful interference. India, therefore, as an affected administration, proposes timely completion of sharing studies and coordination mechanism for coexistence between MSS and terrestrial component of IMT in the band 2 655-2 690 MHz by way of proposing a minor revision to Resolution **225 (Rev.WRC-12)**.

Proposal

Mobile satellite systems serve unique and critical communication needs of difficult hilly, remote and rural regions. The harmful interference to the operational mobile satellite service has deprived the affected member administrations of the use of these services which are critical to their national requirements. Many terrestrial International Mobile Telecommunication systems have recently grown significantly and are continuously being deployed at an increasing pace in large numbers in semi-urban and urban regions over a large geographical area in the frequency band 2 500-2 690 MHz that overlaps with MSS frequency band 2 655-2 690 MHz (Earth-to-space). The aggregate interference from terrestrial IMT systems operating in different countries beyond the services area of the mobile-satellite service networks has potential to cause harmful interference to the MSS payloads of these networks which provide service within national boundaries. There is hence an urgent need to complete the sharing and coexistence studies between terrestrial IMT and mobile satellite service in 2 655-2 690 MHz band so that sharing criteria thus evolved for coexistence would assist the administrations to use this band for both terrestrial IMT and MSS services and their future deployments. The interference to MSS in this frequency band is also included in Annex-2 of Part-1 of the Report of the Director on the activities of the Radiocommunication sector to WRC‑19 under section 2.

Hence, the Administration of India proposes revision of Resolution **225 (Rev.WRC-12)** to enable, as a matter of urgency, completion of the sharing studies providing technical, operational and if required regulatory measures for the co-existence of mobile satellite service and terrestrial component of IMT in the band 2 655-2 690 MHz and report the result of this study to WRC-23. The draft revised Resolution **225 (Rev.WRC-12)** is included in Annex.

ANNEX

MOD IND/92A21/1

RESOLUTION 225 (Rev.WRC‑19)

**Use of additional frequency bands for the satellite component of IMT**

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

considering

*a)* that the bands 1 980-2 010 MHz and 2 170-2 200 MHz are identified for use by the satellite component of International Mobile Telecommunications (IMT) through No. **5.388** and Resolution **212 (Rev.WRC‑07)**[[1]](#footnote-1)\*;

*b)* Resolutions **212 (Rev.WRC‑07)**\*, **223 (Rev.WRC‑12)**\* and **224 (Rev.WRC‑12)**\* on the implementation of the terrestrial and satellite components of IMT;

*c)* that the bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5‑1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz and 2 483.5-2 500 MHz are allocated on a co‑primary basis to the mobile-satellite service and other services in accordance with the Radio Regulations;

*d)* that, in Region 3, the bands 2 500‑2 520 MHz and 2 670‑2 690 MHz are allocated on a co‑primary basis to the mobile-satellite service and other services in accordance with the Radio Regulations;

*e)* that distress, urgency and safety communications of the Global Maritime Distress and Safety System and the aeronautical mobile-satellite (R) service have priority over all other mobile-satellite service communications in accordance with Nos. **5.353A** and **5.357A**,

recognizing

*a)* that services such as broadcasting-satellite, broadcasting-satellite (sound), mobile-satellite, fixed (including point-to-multipoint distribution/communication systems) and mobile are in operation or planned in the band 2 500-2 690 MHz, or in portions of that band;

*b)* that other services such as the mobile service, the radio astronomy service and radiodetermination-satellite service are in operation or planned, in accordance with the Table of Frequency Allocations, in the bands 1 518-1 559/1 626.5-1 660.5 MHz, 1 610-1 626.5/2 483.5-2 500 MHz and 1 668-1 670 MHz, or in portions of those bands, and that those bands, or portions thereof, are intensively used in some countries by applications other than the IMT satellite component, and the sharing studies within ITU‑R are not finished;

*c)* that studies of potential sharing and coordination between the satellite component of IMT and the terrestrial component of IMT, mobile-satellite service applications and other high-density applications in other services such as point-to-multipoint communication/distribution systems in the bands 2 500-2 520 MHz and 2 670-2 690 MHz bands are not finished;

*d)* that the bands 2 520-2 535 MHz and 2 655-2 670 MHz are allocated to the mobile-satellite, except aeronautical mobile-satellite, service for operation limited to within national boundaries pursuant to Nos. **5.403** and **5.420**;

*e)* Resolution ITU‑R 47 on studies under way on satellite radio transmission technologies for IMT,

resolves

1 that, in addition to the frequency bands indicated in *considering a)* and *resolves*2, the frequency bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz and 2 483.5-2 500 MHz may be used by administrations wishing to implement the satellite component of IMT, subject to the regulatory provisions related to the mobile-satellite service in these frequency bands;

2 that the bands 2 500-2 520 MHz and 2 670-2 690 MHz as identified for IMT in No. **5.384A** and allocated to the mobile-satellite service in Region 3 may be used by administrations in that Region wishing to implement the satellite component of IMT; however, depending on user demand, it may be possible in the longer term that the administrations decide to use these bands for the terrestrial component of IMT (see the Preamble of the ITU Constitution);

3 that this identification of frequency bands for the satellite component of IMT does not preclude the use of these bands by any applications of the services to which they are allocated and does not establish priority in the Radio Regulations,

invites ITU‑R

1 to study the sharing and coordination issues in the above bands related to use of the mobile-satellite service allocations for the satellite component of IMT and the use of this spectrum by the other allocated services, including the radiodetermination-satellite service;

2 to report the results of these studies to a future world radiocommunication conference;

3 to urgently conduct sharing study and develop an ITU‑R Recommendation providing technical, operational and, if required, regulatory measures for the coexistence of the mobile-satellite service and terrestrial component of IMT in the band 2 655-2 690 MHz referred to in *recognizing c)* and *d)* above, and report the result of this study to WRC‑23,

invites the Director of the Telecommunication Development Bureau

to draw the attention of the Telecommunication Development Sector to this Resolution.

**Reasons:** While the studies of potential for sharing and coordination between the mobile-satellite service and the terrestrial component of IMT have not been completed (for more than two study cycles) as in *recognizing* *c)*, deployment of terrestrial component of IMT systems in the band 2 655‑2 690 MHz has proliferated and thereby increasing the potential for causing interference into existing and planned mobile-satellite service by terrestrial component of IMT. Indian MSS operations, which are providing service within national boundaries, are presently experiencing harmful interference in this band. Hence, there is an urgent need to find technical and regulatory measures to ensure coexistence of both mobile-satellite service and terrestrial component of IMT.

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1. \* *Note by the Secretariat:* This Resolution was revised by WRC-15. [↑](#footnote-ref-1)