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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 16 to Document 47-E** |
|  | **7 October 2019** |
|  | **Original: English** |
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| Australia | |
| PROPOSALS FOR THE WORK OF THE CONFERENCE | |
|  | |
| Agenda item 1.16 | |

1.16 to consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, in accordance with Resolution **239 (WRC-15)**;

# 1 Introduction

Over the last four years, in accordance with Resolution **239 (WRC-15)**, ITU-R Working Party 5A (WP 5A) has undertaken comprehensive studies relating to aspects of WAS/RLANs in five frequency bands (5 150-5 250 MHz, 5 250-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz).

In addition to undertaking sharing and compatibility studies, WP 5A reviewed the technical characteristics, operational requirements and possible mitigation techniques to potentially allow the use of WAS/RLANs in a number of 5 GHz frequency segments, while protecting incumbent services. It also examined the possibility of outdoor operation in the 5 150-5 250 MHz segment and reviewed indoor/outdoor restrictions in the adjacent 5 250-5 350 MHz segment.

In the 5 150-5 250 MHz frequency band there are five fixed-satellite service gateway facilities licensed in Australia that support non-GSO MSS systems *Globalstar, Omnispace and Sirion*. In some cases gateway stations utilise several E-to-s feeder links allowing access to multiple satellites of these systems.

In the 5 725-5 850 MHz frequency band, land and maritime Radiolocation services operating in Australia require ongoing protection from WAS/RLANs operating in the band. Although this band has been utilised for low power WAS/RLANs in some countries on a no‑interference, no-protection basis for a number of years, there is potential for higher power high density WAS/RLAN systems to increase the noise floor and be a detriment to incumbent radiolocation systems.

Australia supports Method A1 (NOC) on the 5 150-5 250 MHz band and Method D1 (NOC) on the 5 725-5 850 MHz band.

Background on the 5 150-5 250 MHz band

Australia has participated in all WP 5A studies on agenda item 1.16 and has submitted a number of input contributions on the 5 150-5 250 MHz band. WP 5A has examined conditions under which RLANs could operate outdoors in this band without degrading protection for incumbent satellite systems (as required by Resolution **239 (WRC-15)**). However, no agreement has been reached on how incumbent services would be protected if the regulatory conditions of Resolution **229 (Rev.WRC-12)** were relaxed. No draft Reports have been submitted to Study Group 5 for approval and therefore no ITU-R Reports have been produced.

Australia has reviewed the A2 and A3 Methods in the CPM Report and has found that neither would be able to protect non-GSO MSS feeder uplinks in the 5 150-5 250 MHz band. Concerns with these methods can be summarised as follows:

– **Method A2**

This Method would allow a large number of high powered RLANs to operate outdoors potentially resulting in harmful interference to non-GSO MSS feeder uplinks in the 5 150‑5 250 MHz band.

Table 1 provides a comparison of the proposed Method A2 rules and the existing Resolution **229 (Rev.WRC-12)** rules for RLAN emission elevation angles less than or equal to 300 and Table 2 for RLAN emission elevation angles greater than 300.

TABLE 1

RLAN emission elevation angles between 00 and 300

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Existing Resolution 229 (Rev.WRC-12) rules | Proposed Method A2 rules | Difference |
| Maximum e.i.r.p. | 200 mW (23 dBm) | 4 W (36 dBm) | 13 dB |
| Location constraint | Yes, indoor only | No, outdoor permitted |  |
| Resultant max. outdoor e.i.r.p. | 6 dBm\* | 36 dBm | 30 dB\* |

\* Assumes building loss of 17 dB

TABLE 2

RLAN emission elevation angles >300

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Existing Resolution 229  (Rev.WRC-12) rules | Proposed Method A2 rules | Difference |
| Maximum e.i.r.p. | 200 mW (23 dBm) | 125 mW (21 dBm) | -2 dB |
| Location constraint | Yes, indoor only | No, outdoor permitted |  |
| Resultant max. outdoor e.i.r.p. | 6 dBm\* | 21 dBm | +15 dB\* |

\* Assumes building loss of 17 dB

In summary, Method A2 would:

• For RLAN emission elevation angles between 00 and 300, result in an effective e.i.r.p. increase for each outdoor RLAN of 30 dB compared to the existing 23 dBm permitted by Resolution **229 (Rev.WRC-12)**; 17 dB from being outdoors and 13 dB from the maximum e.i.r.p. increase to 36 dBm

• For RLAN emission elevation angles >300, result in an effective e.i.r.p. increase for each outdoor RLAN of 15 dB compared to the existing 23 dBm permitted by Resolution **229 (Rev.WRC-12)**; 17 dB from being outdoors and -2 dB from the maximum e.i.r.p. decrease to 21 dBm.

• Enable large numbers of outdoor RLANs operating at significantly increased e.i.r.p.s. with no proposal on how to limit these numbers; and

• Enable large numbers of outdoor RLANs operating at significantly increased e.i.r.p.s. in multiple adjacent countries with no proposal on how to limit the resultant aggregate noise interference received by the affected satellites or on how to identify the source of the interference.

– **Method A3**

This Method would allow a large number of high powered RLANs to operate outdoors potentially resulting in interference to non-GSO MSS feeder uplinks in the 5 150-5 250 MHz band. To mitigate against such interference it is proposed to adopt an e.i.r.p. elevation mask from the adjacent 5 250-5 350 MHz band.

Table 3 provides a comparison of the proposed Method A3 rules and the existing Resolution **229 (Rev.WRC-12)** rules.

TABLE 3

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Existing Resolution 229 (Rev.WRC-12) rules | Proposed Method A3 rules | Difference |
| Maximum e.i.r.p. | 200 mW (23 dBm) | 1 W (30 dBm) | 7 dB |
| Location constraint | Yes, indoor only | No, outdoor permitted |  |
| Resultant max. outdoor e.i.r.p. | 6 dBm\* | 30 dBm | 24 dB\* |

\* Assumes building loss of 17 dB

In summary, Method A3 would:

• Allow outdoor RLANs to operate with an effective e.i.r.p. increase of 24 dB above the existing 23 dBm permitted by Resolution **229 (Rev.WRC-12)**; 17 dB from being outdoors and 7 dB from the maximum e.i.r.p. increase to 30 dBm.

• Require outdoor RLANs to use an e.i.r.p. elevation mask copied from the adjacent 5 250-5 350 MHz band where it was originally developed to protect EESS, Space Research and Meteorological radars. This mask has not been studied to determine its suitability to protect non-GSO MSS feeder links operating in the 5 150-5 250 MHz band. Importantly, existing and planned feeder links operate from as low as 50 above each horizon where the proposed Method A3 mask appears to have its maximum e.i.r.p.

• Enable large numbers of outdoor RLANs operating at increased e.i.r.p.s. with no proposal to limit the number, for example, through individual registration of each outdoor RLAN by national spectrum regulators; and

• Enable large number of outdoor RLANs operating at increased e.i.r.p.s in adjacent countries without limits on aggregate noise interference received by affected satellites or methods to identify the source of the interference.

Background on the 5 725-5 850 MHz band

Compatibility studies performed in preparation for WRC-15 indicated that the proposed WAS/RLAN mitigation measures were insufficient to ensure protection of certain radar types. Recognising that sharing between the mobile service and the radiolocation service may only be feasible if additional WAS/RLAN mitigation measures were implemented, Resolution **239 (WRC-15)** explicitly invited ITU-R to investigate mitigation techniques i.e. “to conduct detailed sharing and compatibility studies, including mitigation techniques, between WAS/RLAN and incumbent services”.

As noted in the CPM Report the current mitigation techniques are not sufficient to protect some radars operating in the 5 725-5 850 MHz frequency band. No new elements have been presented on any additional mitigation techniques to provide protection to these systems.

Some analyses have confirmed that considerable protection distances are required to ensure unhindered operation of the radiolocation service. A statistical analysis conducted in relation to radars 22 and 23 of Recommendation ITU-R M.1638-1 has shown that the current WAS/RLAN dynamic frequency selection (DFS) system is unable to detect those radars. Further, no new proposals have been presented on any additional mitigation techniques to provide protection to fast frequency hopping radar operating modes.

# 2 Proposals

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations  
(See No. 2.1)

NOC AUS/47A16/1#49950

4 800-5 250 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 5 150-5 250 FIXED-SATELLITE (Earth-to-space) 5.447A  MOBILE except aeronautical mobile 5.446A 5.446B  AERONAUTICAL RADIONAVIGATION  5.446 5.446C 5.447 5.447B 5.447C | | |

**Reasons:** Due to concerns on how incumbent services such as non-GSO MSS feeder uplinks would be protected if the regulatory conditions of Resolution **229 (Rev.WRC-12)** were relaxed, and the lack of any ITU-R Reports on WRC-19 agenda item 1.16 after four years of study by WP 5A, Australia does not support Method A2 or Method A3 of the CPM Report. Australia’s position is therefore to support Method A1 of the CPM Report (NOC) for the 5 150-5 250 MHz band.

NOC AUS/47A16/2#49956

5 250-5 570 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 5 250-5 255 EARTH EXPLORATION-SATELLITE (active)  MOBILE except aeronautical mobile 5.446A 5.447F  RADIOLOCATION  SPACE RESEARCH 5.447D  5.447E 5.448 5.448A | | |
| 5 255-5 350 EARTH EXPLORATION-SATELLITE (active)  MOBILE except aeronautical mobile 5.446A 5.447F  RADIOLOCATION  SPACE RESEARCH (active)  5.447E 5.448 5.448A | | |

**Reasons:** Australia supports the single Method B of the CPM Report (NOC) for the 5 250-5 350 MHz band.

NOC AUS/47A16/3#49957

5 250-5 570 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 5 350-5 460 EARTH EXPLORATION-SATELLITE (active) 5.448B  RADIOLOCATION 5.448D  AERONAUTICAL RADIONAVIGATION 5.449  SPACE RESEARCH (active) 5.448C | | |
| 5 460-5 470 EARTH EXPLORATION-SATELLITE (active)  RADIOLOCATION 5.448D  RADIONAVIGATION 5.449  SPACE RESEARCH (active)  5.448B | | |

**Reasons:** Australia supports the single Method C of the CPM Report (NOC) for the 5 350-5 470 MHz band.

NOC AUS/47A16/4#49958

5 570-6 700 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 5 725-5 830  FIXED-SATELLITE (Earth-to-space)  RADIOLOCATION  Amateur | 5 725-5 830  RADIOLOCATION  Amateur | |
| 5.150 5.451 5.453 5.455 | 5.150 5.453 5.455 | |
| 5 830-5 850  FIXED-SATELLITE (Earth-to-space)  RADIOLOCATION  Amateur  Amateur-satellite (space-to-Earth) | 5 830-5 850  RADIOLOCATION  Amateur  Amateur-satellite (space-to-Earth) | |
| 5.150 5.451 5.453 5.455 | 5.150 5.453 5.455 | |

**Reasons:** Due to the lack of studies showing the compatibility of WAS/RLAN with other services in the band 5 725–5 850 MHz, in particular the radiolocation service, and in the absence of any detailed mitigation techniques being proposed, Australia supports Method D1 of the CPM Report (NOC) in the 5 725–5 850 MHz band.

NOC AUS/47A16/5#49963

5 570-6 700 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 5 850-5 925  FIXED  FIXED-SATELLITE (Earth-to-space)  MOBILE | 5 850-5 925  FIXED  FIXED-SATELLITE (Earth-to-space)  MOBILE  Amateur  Radiolocation | 5 850-5 925  FIXED  FIXED-SATELLITE  (Earth-to-space)  MOBILE  Radiolocation |
| 5.150 | 5.150 | 5.150 |

**Reasons:** Australia supports the single Method E of the CPM Report (NOC) for the 5 850-5 925 MHz band.

SUP AUS/47A16/6#49964

RESOLUTION 239 (WRC‑15)

Studies concerning Wireless Access Systems including radio local   
area networks in the frequency bands between   
5 150 MHz and 5 925 MHz

**Reasons:** No longer required post WRC-19.

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