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| **The 5th Meeting of the APT Conference Preparatory****Group for WRC-23 (APG23-5)** | **APG23-5/OUT-22** |
| 20 – 25 February 2023, Busan, Republic of Korea | 24 February 2023 |

Working Party 3

**preliminary views on WRC-23 agenda item 1.14**

**Agenda Item 1.14:**

*to review and consider possible adjustments of the existing or possible new primary frequency allocations to EESS (passive) in the frequency range 231.5-252 GHz, to ensure alignment with more up-to-date remote-sensing observation requirements, in accordance with Resolution* ***662 (WRC-19)****;*

**1. Background**

As Per Resolution **662 (WRC-19)**, The objective of WRC-23 agenda item 1.14 is to review and consider possible adjustment of the existing or possible new primary frequency allocations to the Earth exploration-satellite service (EESS) (passive) in the frequency range 231.5-252 GHz, to ensure alignment with more up-to-date remote sensing observation requirements, ensure that the allocations to the EESS (passive) within the considered frequency range correspond to the observation requirements for satellite passive microwave sensing without unduly constraining the operation of other primary services currently allocated in this frequency range, taking into account the possible effect on the other primary services in the considered frequency range.

EESS (passive) microwave sensing mainly includes Ice Cloud Measurements and atmosphere gases measurement. The Ice Cloud Imager (ICI) instrument which is a conical scanning millimetre/sub-millimetre wave radiometer, performs measurements of cloud ice water paths and cirrus clouds operating in two symmetric spectral bands of 239.2-242.2 GHz and 244.2-247.2 GHz. The Microwave Limb Sounder (MLS) instrument continuously observes thermal emission from utilizing spectrometers of numerous channels within the frequency band 231.5-252 GHz to measure the chemical processes and compounds within Earth’s atmosphere.

Compatibility studies show that, in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz, the sharing between the conical scanning passive sensors (like ICI) and systems of the fixed service (FS)/mobile service (MS) is not feasible. Studies also show that limb sounding passive sensors are compatible with systems of the FS/MS in the whole frequency range 231.5-252 GHz. Further, the sharing between the fixed-satellite service (FSS) (GSO, space-to-Earth) and EESS (passive) is feasible within the whole frequency range 232-240 GHz. More details on the scientific background can be found in the PDN Report ITU-R RS.[231.5-252 GHz EESS]. Preliminary draft CPM text on WRC-23 agenda item 1.14 has been published by ITU-R. In this document, summary and analysis of the results of ITU-R studies are presented. In order to satisfy this agenda item three methods have been presented.

**Method A -** Addition of new primary allocations to the EESS (passive) in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz and no change to the current allocations in the frequency band 239.2-242.2 GHz.

**Method B -** Addition of new primary allocations to the EESS (passive) in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz, and possible adjustment of the current FS and MS allocations in the frequency band 239.2-241 GHz.

**Method C –** No change

**2. Documents**

-Input Documents: APG23-5/INP-10 (THA), APG23-5/INP-16(JPN), APG23-5/INP-28(IND), APG23-5/INP-34(BGD), APG23-5/INP-38(IRN), APG23-5/INP-58(AUS), APG23-5/INP-65(KOR), APG23-5/INP-90(CHN), APG23-5/INP-97(MLA)

- Information Documents: APG23-5/INF-01 (WMO), APG23-5/INF-39 (CEPT),APG23-5/INF-21(IARU), APG23-5/INF-43 (CITEL), APG23-5/INF-45 (RCC)

**3. Summary of Discussions**

**-3.1 Summary of Members’ view**

**3.1.1 Thailand (Kingdom of) - Document APG23-5/INP-10**

Thailand supports possible adjustments to the existing or possible new primary frequency allocations to EESS (passive) in the frequency range 231.5-252 GHz. Any changes to the EESS (passive) allocations in the frequency range 231.5-252 GHz should not adversely affect the operation of other primary services allocated in this frequency range.

**3.1.2 Japan-Document** [**APG23-5/INP-16**](file:///D%3A%5CAPT%20Docs%5CAPG%5CAPG2023%5CAPG23-5%5CDocuments%5COriginal%20OUT%20documents%5CAPG23-4-INP-09_J-3_WP3_Preliminary_Views_on_WRC-23_Agenda_Items_1.12_1.13_1.14_9.1.A_9.1.D_and_RES.655.docx)

The Fixed, Mobile, Fixed-satellite (space-to-Earth), Radiodetermination, Radionavigation and Radionavigation-satellite services are allocated in the 239.2-242.2 GHz band and its adjacent band, and the Radiodetermination, Radio astronomy, Amateur and Amateur-satellite services are allocated in the 244.2-247.2 GHz band and its adjacent band in Japan. Among those services, the incumbent active services should not be imposed undue restrictions. Japan supports further ITU-R studies because the successful sharing and compatibility with the incumbent services are not ensured.

**3.1.3 India(Republic of)-Document** [**APG23-5/INP-28**](file:///D%3A%5CAPT%20Docs%5CAPG%5CAPG2023%5CAPG23-5%5CDocuments%5COriginal%20OUT%20documents%5CAPG23-4-INP-09_J-3_WP3_Preliminary_Views_on_WRC-23_Agenda_Items_1.12_1.13_1.14_9.1.A_9.1.D_and_RES.655.docx)

India supports the consideration of possible adjustments of the existing or new primary frequency allocations to EESS (passive) in the frequency range 231.5-252 GHz in accordance with Resolution 662 (WRC-19) subject to the outcome of the results of ITU-R studies. Therefore, India supports Method B which proposes addition of new primary allocations to the EESS (passive) in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz, and shifting of the existing FS and MS allocations to the frequency band 235-238 GHz.

**3.1.4 Bangladesh (People’s Republic of)-Document** [**APG23-5/INP-**](file:///D%3A%5CAPT%20Docs%5CAPG%5CAPG2023%5CAPG23-5%5CDocuments%5COriginal%20OUT%20documents%5CAPG23-4-INP-21_BGD_WP3_Preliminary_Views_on_WRC-23_Agenda_Items_1.13_and_1.14.docx)**34**

In order to review and consider possible adjustments of the existing or possible new primary frequency allocations to EESS (passive) in the frequency range *231.5-252 GHz* Bangladesh administration prefers method B of the draft CPM report to WRC-2023.

**3.1.5 Iran (Islamic Republic of) -Document APG23-5/INP-38**

This Administration currently considers that Method B with appropriate regulatory language reflecting the objectives of the relevant Note(s) in that Method may achieve the intent/ objectives of this agenda item, as stipulated in Resolution **662 (Rev.WRC-19).** However, this view is preliminary and is subject to the conclusions to be reached at CPM23-02.

It is to be noted that Method A does not comply with ITU-R practices and it is not in line with Resolution **662**, since pursuant to this method (see **ADD** **5.A114)**, the new incoming Earth exploration-satellite service (passive) impose power limitations on stations of the incumbent fixed and mobile services,while in accordance with *invites the 2023 WRC of Resolution* ***662***, it is stipulated that

“Adding possible new allocations, to the EESS (passive) in the frequency range 231.5-252 GHz shall not *unduly constrain* the other primary services currently allocated in this frequency range”

Moreover, if Method A adopted, it creates precedence of regulatory nature in use of such limitation/ restriction in future.

**3.1.6 Australia-Document APG23-5/INP-58**

Australia supports the addition of new primary allocations to the EESS (passive) in the bands 239.2– 242.2 GHz and 244.2–247.2 GHz, and possible adjustments to the existing Fixed Service and Mobile Service allocations in the 239.2–241 GHz band, in order to maximise the benefit to all involved services. Australia supports the proposed Method B as the most comprehensive and useful way to achieve this outcome.

**3.1.7** **Korea (Republic of)-Document** [**APG23-5/INP-65**](file:///D%3A%5CAPT%20Docs%5CAPG%5CAPG2023%5CAPG23-5%5CDocuments%5COriginal%20OUT%20documents%5CAPG23-4-INP-36_KOR_WP3_Preliminary_Views_on_WRC-23_Agenda_Items_1.12_1.13_1.14_and_9.1Topic_a_and_d.docx)

The Republic of Korea supports possible adjustments of the existing or possible new primary allocations to EESS (passive) in the frequency range 231.5-252 GHz in accordance with Resolution **662 (WRC-19)** subject to the study results, while it is required to ensure not adversely affecting the operation of other primary services allocated in this frequency band.

**3.1.5 China (People’s Republic of)-Document APG23-5/INP-90**

China supports the addition of new allocation to EESS(passive) in frequency bands 239.2-242.2GHz and 244.2-247.2GHz and adjustment of the existing FS and MS allocations from 239.2-241GHz (1.8GHz bandwidth) to 235-238GHz (3GHz bandwidth).

In order to avoid undue constraints on the FS and MS in the frequency band 235-238GHz, China supports limiting the existing allocation to EESS (passive) in this frequency band for use by limb sounding passive sensors and stations in EESS (passive) should not claim protection from stations of the fixed and mobile services.

**3.1.7 Malaysia-**[**APG23-5/INP-97**](file:///D%3A%5CAPT%20Docs%5CAPG%5CAPG2023%5CAPG23-5%5CDocuments%5COriginal%20OUT%20documents%5CAPG23-4-INP-68_MLA_WP3_Preliminary_Views_on_WRC-23_Agenda_Items_1.12_and_1.14.docx)

Malaysia supports the possible addition of new primary allocations to Earth exploration-satellite service (EESS) (passive) in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz, provided any changes to the EESS (passive) allocations shall not adversely affect the operation of other primary services allocated in this frequency range.

**3.2 Summary of issues raised during the meeting**

None.

**4. APT Preliminary View(s)**

APT Members support the consideration of possible adjustment of the existing or possible new primary frequency allocations to EESS (passive) in the frequency range 231.5-252 GHz in accordance with Resolution **662 (WRC-19)** based on the outcome of the study results, provided that, any changes to the EESS (passive) allocations in the frequency range 231.5-252 GHz shall not adversely affect the operation of other primary services allocated in this frequency range.

Based on the above preliminary views, at this stage, APT Members are considering Method B of the draft CPM report to WRC-23 to address this agenda item.

**5. Other View(s) from APT Members**

Some APT Members are of the view that further ITU-R studies will be required because the successful sharing and compatibility with the incumbent services are not ensured for the Radiolocation service in the frequency band 238-248 GHz, and the Radionavigation and Radionavigation-satellite services in the frequency band 238-240 GHz.

**6. Issues for Consideration at Next APG Meeting**

APT preliminary view(s) on this topic should be reviewed and revised in accordance with the progress of studies in ITU-R Working Parties and Contributions from APT Members. APT Members are encouraged to participate in the studies of the ITU-R, and to submit their views to the next APG meeting.

**7. Views from Other Organizations**

**7.1 Regional Groups**

**7.1.1 CEPT** - **Document APG23-5/INF-39**

CEPT supports to cover relevant requirements of passive microwave sensor measurements within the frequency range 231.5-252 GHz with frequency allocations to EESS (passive) without unduly constraining the other primary services currently allocated in this frequency range, specifically:

• In line with the scientific observation requirements identified so far, CEPT supports a new primary allocation to the EESS (passive) in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz;

• In order to avoid undue constraints to the primary services to which the bands 239.2-242.2 GHz and 244.2-247.2 GHz are currently allocated and subject to the outcome of the relevant sharing and compatibility studies with the services to which these and the adjacent bands are already allocated, CEPT is also proposing a shift of existing allocations to the FS and MS in the frequency band 239.2-241 GHz into the frequency band 235-238 GHz;

• In order to ensure that there will be no potential future impact to FS and MS in the frequency band 235-238 GHz, CEPT proposes to limit the existing allocation to EESS (passive) in this frequency band for use by limb sounding passive sensors only.

**7.1.2 CITEL** - **Document APG23-5/INF-43**

**MOD** article 5 - **200-248 GHz**

**Reason:**

Provides additional spectrum for EESS (passive) to ensure alignment with more up-to-date remote sensing observation requirements while at the same time not putting undue burden on incumbent services sharing the same band.

• **ADD 5.B114-Opt1**

• **SUP RESOLUTION 662 (WRC 19)** Review of frequency allocations for the Earth exploration-satellite service (passive) in the frequency range 231.5-252 GHz and consideration of possible adjustment according to observation requirements of passive microwave sensors

**7.1.3 RCC -** **Document APG23-5/INF-45**

The RCC Administrations consider the need to adjust and to allocate frequency band 231.5-252 GHz to EESS (passive). No specific Method from the draft CPM Report is supported.

**7.2 International organizations**

**7.2.1 WMO** - **Document APG23-5/INF-01**

WMO supports new primary allocations to EESS (passive) in the frequency bands 239.2-242.2 GHz and 244.2-247.2 GHz in order to accommodate the requirements for ice cloud measurements.

In order to avoid undue constraints on the FS and MS in the band 239.2-241 GHz (currently with an allocation of 1.8 GHz in bandwidth), WMO also supports the shift of the existing FS and MS allocations to the band 235-238 GHz (providing an allocation of 3 GHz in bandwidth). In order to ensure that there would be no potential future impact to FS and MS in the band 235-238 GHz, WMO would accept limiting the existing allocation to EESS (passive) in the band 235-238 GHz for use by limb sounding passive sensors only.

**7.2.1 IARU- Document APG23-5/INF-21**

The IARU supports retention of the 248-250 GHz primary allocations and the 241 – 248 GHz secondary allocations to the amateur and amateur-satellite services. Within this frequency range there is ongoing experimentation by amateur service stations, which is expected to grow as technology and equipment availability improves. Any introduction of EESS into the 241-250 GHz frequency range should not unduly constrain the ongoing experimental use by the amateur and amateur satellite services in their secondary and primary allocations or their future development.

IARU prefers Method C (No change) in a draft CPM Report, but may support Method B as long as neither the secondary amateur allocation 241 – 248 GHz nor our primary allocation 248 – 250 Hz are adversely affected.