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|  | ASIA-PACIFIC TELECOMMUNITY | **Document No:** |
| **The 4th Meeting of the APT Conference Preparatory****Group for WRC-19 (APG19-4)** | **APG19-4/OUT-31** |
| 7 – 12 January 2019, Busan, Republic of Korea | 11 January 2019 |

Working Party 4

**PRELIMINARY VIEWs on WRC-19 agenda item 1.7**

**Agenda Item 1.7:**

*to study the spectrum needs for telemetry, tracking and command in the space operation service for non-GSO satellites with short duration missions, to assess the suitability of existing allocations to the space operation service and, if necessary, to consider new allocations, in accordance with Resolution* ***659 (WRC-15)****;*

**1. Background**

The need for more spectrum dedicated to telemetry, tracking and command (TT&C) requirement, particularly for small satellites operating in non-geostationary orbit (non-GSO), was considered at WRC-15.

Resolution **659 (WRC-15)** calls to study the spectrum needs for telemetry, tracking and command in the space operation service for NGSO satellites with short duration missions, to assess the suitability of existing allocations to the space operation service and, if necessary, to consider new allocations. Typical short duration missions are understood in this context to have a maximum lifetime of three years.

**Progress of ITU-R ongoing study**

At the WP 7B May 2018 meetings, WP 7B:

* completed the draft CPM text for AI 1.7
* completed the DN Report ITU-R SA.[SHORT DURATION NGSO – CHARACTERISTICS] and forwarded it to the September 2018 meeting of SG 7 that adopted it as ITU-R Report SA.2426.
* completed the DN Report ITU-R SA.[SHORT DURATION NGSO – REQUIREMENTS] and forwarded it to the September 2018 meeting of SG that adopted it as ITU-R Report SA.2425.

At the WP 7B September 2018 meetings, WP 7B:

* completed DN Report ITU-R SA.[SHORT DURATION NGSO – SHARING STUDIES] and forwarded it to the September 2018 meeting of SG 7 that adopted it as ITU-R Report SA.2427.
* initiated a new work specifically addressing AM(R)S systems below 137 MHz in Working document towards a preliminary draft new Report ITU-R SA.[AM(R)S - COMPATIBILITY] - Adjacent band compatibility studies between the AM(R)S systems below 137 MHz and SOS non-GSO Short Duration satellite systems proposed in the 137-138 MHz (s-E) and 148-149.9 MHz (E-s) frequency bands

**The draft CPM Methods**

Four methods and associated regulatory texts were developed to satisfy this agenda item. Methods B1 and B2 propose a new allocation and Method C proposes to use existing allocations:

* Method A proposes no change to the Radio Regulations;
* Method B1 proposes a new SOS (Earth-to-space) allocation for non-GSO SD systems in the frequency range 403-404 MHz;
* Method B2 proposes a new SOS (Earth-to-space) allocation for non-GSO SD systems in the frequency range 404-405 MHz;
* Method C proposes to use the SOS allocation in the frequency band 137-138 MHz for downlink and the band 148-149.9 MHz for uplink and to provide appropriate associated regulatory provisions in the Radio Regulations for telecommand links of non-GSO SD missions.

**2. Documents**

* Input Documents: APG19-4/INP-18(AUS), APG19-4/INP-25 (NZL), APG19-4/INP-32 (THA), APG19-4/INP-62 (J), APG19-4/INP-78 (KOR), APG19-4/INP-93 (SNG), APG19-4/INP-97 (CHN), APG19-4/INP-121 (INS).
* Information Documents: APG19-3/OUT-20, APG19-4/INF-02 (WMO), APG19-4/INF-03 (IARU R3), APG19-4/INF-04 (ICAO), APG19-4/INF-05 (ICAO), APG19-4/INF-22 (CITEL), APG19-4/INF-23 (CEPT), APG19-4/INF-24 (RCC).

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 Australia - Document APG19-4/INP-18**

Australia supports studies of spectrum requirements and the suitability of current allocations below 1 GHz for the space operation service (SOS) for telemetry, tracking and command for non-GSO satellites with short duration missions (i.e. missions less than three years), taking into account No. **1.23** based on the outcome of studies in accordance with Resolution **659 (WRC-15)**.

Australia notes that current allocations below 1 GHz have been found to not fully meet requirements and would consider measures to ensure the suitability of existing SOS allocations in the frequency range below 1 GHz under *invites ITU-R* 2 of Resolution **659 (WRC-15)**.

Australia, based on the results of sharing or compatibility studies, would also consider possible new allocations or, an upgrade of the existing SOS allocations within the frequency ranges 150.05-174 MHz and 400.15-420 MHz as identified in *invites ITU-R* 3 of Resolution **659 (WRC-15)**.

Any changes to the Radio Regulations will be dependent on satisfactory results of
ITU-R sharing and compatibility studies and studies into possible mitigation techniques to protect incumbent services, both in-band as well as in adjacent bands.

**3.1.2 New Zealand - Document APG19-4/INP-25**

New Zealand supports a new allocation to space operation (Earth-to-space) service in the frequency range 403-404 MHz (i.e. Method B1).

New Zealand is also of the view that the following frequency ranges should not be considered:

* maritime mobile VHF radiocommunication in the frequency ranges 156-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, in accordance with RR No. **5.226** and Appendix **18 (Rev. WRC-15)**; and
* mobile-satellite service in the frequency range 406-406.1 MHz that is dedicated for satellite emergency position-indicating radio beacons, in accordance with Resolution **205 (Rev. WRC-15)**.

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**3.1.3 Thailand - Document APG19-4/INP-32**

Thailand is of the view that protection of existing services is necessary and any new allocations or upgrades of existing allocations to the space operation service should be applied without any constraint to the incumbent services including their current and planned use, both in-band as well as adjacent bands.

**3.1.4 Japan - Document APG19-4/INP-62**

Japan does not support Method B1 and B2 since there are studies which indicate that it is not possible to share the above said frequencies with the existing meteorological aids service.

For Method C, Japan supports further ITU-R studies for sharing with aeronautical mobile (R) service which uses the adjacent frequency band currently being addressed in WP 7B. Also, Japan would like to note that there are concerns on not needing to obtain agreement under RR No. 9.21 since many radio stations of land mobile service exist in the 148-149.9 MHz band.

**3.1.5 Korea (Rep. of) - Document APG19-4/INP-78**

Considering that several studies show that co-channel sharing with MetAids is not feasible in the 403‑406 MHz band and the impact of removal of RR No. **9.21** (in particular for non-GSO SD missions) is still to be studied, the Republic of Korea supports no changes to the Radio Regulations under this agenda item.

**3.1.6 Singapore - Document APG19-4/INP-93**

Singapore is of the view that studies within ITU-R Working Party 7B are required between AM(R)S aeronautical safety systems operating on a global basis below 137 MHz and SOS systems in accordance with Resolution **659 (WRC-15)**. Moreover, any proposed regulatory actions for new allocations or upgrades of existing allocations to the space operation service shall only be applied without any constraint to the existing and planned incumbent services and their future development, both in-band as well as adjacent bands based on agreed studies.

Supportive of APT Preliminary views in APG19-3, Singapore is also of the view the view that the following frequency ranges should not be considered:

* Maritime mobile VHF radiocommunication in the frequency ranges 156-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, in accordance with RR No. **5.226** and Appendix **18** (**Rev. WRC-15**)**.**
* The frequency range 406-406.1 MHz that is dedicated for satellite emergency position-indicating radio beacons, in accordance with Resolution **205** (**Rev. WRC-15**); and
* Frequency bands used by Global Maritime Distress and Safety System (GMDSS) included in Appendix **15** of RR.

**3.1.7 China (People’s Republic of) - Document APG19-4/INP-97**

China supports to satisfy the additional spectrum requirements by possible new allocations or an upgrade of the existing allocations to the SOS on a primary basis in accordance with Resolution 659 (WRC-15) if the studies show that sharing and compatibility both in-band and out-of-band is feasible with existing services and systems.

**3.1.8 Indonesia (Republic of) - Document APG19-4/INP-121**

Indonesia is of the view that the use of new or existing space operation service allocation for telemetry, tracking and command (TT&C) of non-GSO satellites with short duration (non-GSO SD) missions shall ensure the protection of existing services.

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

* Any changes to the Radio Regulations will be dependent on satisfactory results of
ITU-R sharing and compatibility studies.
* Any new allocations or upgrades of existing allocations to the space operation service should be applied without any constraint to the incumbent services including their current and planned use, both in-band as well as adjacent bands.
* Some frequency ranges should not be considered.
* Co-channel sharing with MetAids is not feasible in the 403‑406 MHz band and the impact of removal of RR No. **9.21** (in particular for non-GSO SD missions) is still to be studied.
* There are concerns on not needing to obtain agreement under RR No. **9.21** since many radio stations of land mobile service exist in the 148-149.9 MHz band.

**4. APT Preliminary Views**

APT Members support to satisfy the additional spectrum requirements by possible new allocations or an upgrade of the existing allocations to the SOS on a primary basis in accordance with Resolution **659 (WRC-15)** if the studies show that sharing and compatibility both in-band and out-of-band, is feasible with existing services and systems and without any constraint to the incumbent services, both in-band as well as adjacent bands.

APT Members do not support the consideration of the following frequency ranges:

* Maritime mobile VHF radiocommunication in the frequency ranges 156-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, in accordance with RR No. **5.226** and Appendix **18** (**Rev. WRC-15**)**.**
* The frequency range 406-406.1 MHz that is dedicated for satellite emergency position-indicating radio beacons, in accordance with Resolution **205** (**Rev. WRC-15**); and
* Frequency bands used by Global Maritime Distress and Safety System (GMDSS) included in Appendix **15** of RR.

**5. Other Views from APT Members**

* Some APT Members support no changes to the Radio Regulations under this agenda item.
* Some APT Members support the Method B1 in the draft CPM text. Some other APT Members do not support the Methods B1 and B2 in the draft CPM text.
* There are concerns of APT Members on not needing to obtain agreement under RR No. **9.21** since many radio stations of land mobile service exist in the 148-149.9 MHz band.

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

* APT Members are encouraged to participate in and submit their contributions for the Methods in the draft CPM text to CPM 19-2 and future APG meetings.

**7. Views from Other Organisations**

**7.1 Regional Groups**

**7.1.1 ASMG** - **Document APG19-4/INP-09(Rev.1)**

* No change to the RR based on the results of the current sharing studies for the candidate frequency bands, which confirmed that the space operations service and other existing services in that frequency bands could not be shared.

**7.1.2 ATU** - **Document APG19-4/INP-09(Rev.1)**

* Method A (No Change)

**7.1.3 CEPT** - **Document APG19-4/INF-23**

* CEPT supports the use of the current primary allocation to the space operation service in the space-to-Earth direction in the band 137-138 MHz, associated with relevant technical conditions (e.g. pfd limits).
* CEPT supports studies for possible modifications to the current regulatory situation
including the removal of No **9.21** in the existing allocation to the space operation service in the Earth-to-space direction in the band 148-149.9 MHz.
* As an alternative to the band 148-149.9 MHz, CEPT is still investigating a possible 1 MHz allocation to the space-operation service in the Earth-to-space direction limited to non-GSO satellites with short duration missions within the band 403-405 MHz.

**7.1.4 CITEL** - **Document APG19-4/INF-22**

* One proposal supports NOC and another supports the identification of frequency bands 137-138 MHz and 148-149.9 MHz for tracking, telemetry and command links for NGSO satellites with short duration missions.

**7.1.5 RCC** - **Document APG19-4/INF-24**

* The RCC Administrations consider that when using existing or new frequency allocations to the space operation service below 1 GHz for the purpose to command non-GSO satellites with short duration missions, the protection shall be ensured to the incumbent services in the same and adjacent frequency bands.
* The RCC Administrations consider that when using existing or new frequency allocations to the space operation service below 1 GHz for the purpose to command non-GSO satellites with short duration missions, the protection shall be ensured to the incumbent services in the same and adjacent frequency bands.
* The RCC Administrations oppose using the frequency bands 148-174.0 MHz and 405.9-410 MHz to command non-GSO satellites with short duration missions.
* Do not support removal of RR No. **9.21** in the band 148-149.9 MHz**.**

**7.2 International Organisations**

**7.2.1 ICAO** - **Document APG19-4/INF-4 and Document APG19-4/INF-5**

* To oppose consideration of possible allocation to the space operation service in the frequency range 405.9 ‒ 406.2 MHz unless agreed ITU-R studies have proven aviation use of the EPIRBs operating in the frequency band 406 ‒ 406.1 MHz is protected in accordance with Resolution **205 (Rev. WRC-15)** and RR No. **5.267**.
* To oppose any new allocations, or use of existing allocations, to the space operations service in other frequency bands/ranges that could impact aviation systems unless agreed ITU-R studies have proven sharing and compatibility with those systems.
* To ensure that any change to the regulatory provisions and spectrum allocations resulting from this agenda item do not preclude the use of any particular allocations for space planes if the radiocommunication service is deemed appropriate for such use

**7.2.2 WMO - Document APG19-4/INF-02**

* WMO emphasises that the frequency band 400.15 – 406 MHz is the key band for global radiosonde and DCS operations. Based on studies undertaken in ITU-R, WMO supports a NO Change (NOC) under this agenda item in this frequency band.
* Furthermore, based on studies, the existing SOS allocation in 401-402 MHZ is not appropriate for use for satellites with characteristics and mission requirements matching those of non-GSO short duration mission satellites.

**7.2.3 IARU** - **Document APG19-4/INF-3**

* The IARU supports satisfying the spectrum requirements for non-GSO satellites with short duration missions within the existing allocations for the space operation service or the frequency ranges identified in invites ITU-R 3 of Resolution **659 (WRC-15)**, unless the satellites are amateur satellites as defined in RR Nos. **1.56** and **1.57**.

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