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| APTlogogreen3 | ASIA-PACIFIC TELECOMMUNITY | **Document:** |
| **The 2nd Meeting of the APT Conference Preparatory Group for WRC-19 (APG19-2)** | **APG19-2/OUT-04 (Rev.1)** |
| 17 – 21 July 2017, Bali, Republic of Indonesia | **21 July 2017** |

Working Party 3

**PRELIMINARY VIEWs on WRC-19 agenda item 1.5**

**Agenda Item 1.5:** *to consider the use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion communicating with geostationary space stations in the fixed-satellite service and take appropriate action, in accordance with Resolution* ***158 (WRC-15)***

Resolution **158 (WRC-15)**: *Use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion communicating with geostationary space stations in the fixed-satellite service*

**1. Background**

Earth stations in motion (ESIM) are earth stations that communicate with FSS space stations but operate on moving platforms such as ships, aircraft and land vehicles. ESIM are used to provide broadband connectivity to aircraft, typically used to provide in-flight Internet connectivity for passengers. ESIM installed on ships are used to support broadband communications for passengers and crew, and are also used to support maritime operational requirements. ESIM may also be installed on land vehicles such as trains and buses to provide Internet connectivity for passengers.

WRC-15 introduced regulations for ESIM operating in the frequency bands 19.7-20.2 GHz and 29.5-30 GHz, contained in Resolution **156** (**WRC-15**). In response to increasing needs of communications on the move, including the availability of global broadband satellite services, Resolution **158** (**WRC-15**) invites the ITU‑R to conduct studies related to the possible extension of the frequency range for ESIM to include the bands 17.7-19.7 GHz and 27.5-29.5 GHz.

WP 4A has so far developed several working documents on the ESIM operation containing ESIM requirements, characteristics and spectrum use of ESIM, compatibility with other services, regulatory issues and so forth (Annex 19 to Doc. 4A/364). Annexes to this working document consisting of sharing studies with FS, MS and MSS feeder link and draft CPM text related to this agenda item have been also developed (Annex 8/9/10/11/32 to Doc.4A/364).

APG has noted the work carried out by AWG (APT Wireless Group) (APT/AWG/REP-70), on “The Usage and Future Plans of the Bands 17.7-20.2 GHz and 27.5-30 GHz in the Asia-Pacific Region”.

**2. Documents**

***2.1 Input Documents:***

AWG APG19-2-INP-07\_LS\_from\_AWG

Korea APG19-2-INP-10\_KOR\_WP3

Singapore APG19-2-INP-15\_SNG\_AI1.5

New Zealand APG19-2-INP-22\_NZL\_WP3

Australia APG19-2-INP-30\_AUS\_WP3

Indonesia APG19-2-INP-41\_INS\_WP3

Vietnam APG19-2-INP-46\_VTN\_WP3

China APG19-2-INP-51\_CHN\_WP3

Japan APG19-2-INP-57\_J\_WP3

Thailand APG19-2-INP-66\_THA\_WP3

Iran APG19-2-INP-71\_IRN-1.5

***2.2 Information Documents:***

Chair, APG-19 APG19-2-INF-01\_Status\_of\_Preparation\_of\_Regional\_Groups

CITEL APG19-2-INF-04\_CITEL\_Preparation

RCC APG19-2-INF-05\_RCC

ATU APG19-2-INF-07\_ATU

Multi-affiliates APG19-2-INF-09\_Multi\_Affiliates\_Views

Chair, DG3-2 APG19-2-INF-11\_AI1.5\_WP3

CEPT APG19-2-INF-14\_CEPT\_Preparation\_for\_WRC-19

**3. Summary of Discussions**

**3.1 Summary of Members’ view**

**3.1.1 Korea (Republic of)**

The Republic of Korea has a preliminary view that in the frequency bands 17.7 – 19.7 GHz and 27.5 – 29.5 GHz, ESIM shall not cause harmful interference to the terrestrial services nor claim protection from terrestrial services allocated in the same bands.

**3.1.2 Singapore**

It is noted that there is an increasing need for mobile-satellite broadband communications, however with Singapore’s geographic environment and current infrastructure, such ESIM deployments may be more applicable for on-board aircrafts and vessels platforms for the aeronautical and maritime industries.

Taking this into consideration and the current fixed services operations in the 17.7-19.7GHz band within Singapore, Singapore supports ITU-R studies to consider the potential for ESIM operations in the bands 17.7-19.7GHz and 27.5-29.5GHz with careful considerations to any possible interference to other existing primary services as mandated in Resolution 158 (WRC-15) for these bands.

**3.1.3 New Zealand**

New Zealand supports the studies undertaken by ITU-R WP 4A in accordance with Resolution **158 (WRC-15)**. These studies should determine the regulatory measures to ensure that the introduction of different types of ESIM operating with geostationary fixed satellite service networks would not cause harmful interference and not impose additional constraints to existing space and terrestrial services sharing in the same frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz.

**3.1.4 Australia**

Australia supports a regulatory framework for the operation of ESIMs in the bands 17.7-19.7 GHz and 27.5-29.5 GHz, taking into account Resolution **158 (WRC-15)** while ensuring protection of, and not imposing undue constraints on, services already allocated in those frequency bands.

**3.1.5 Indonesia**

Indonesia is of the view that it is necessary to carefully continue the study in order to get the optimum benefit of ESIM while ensuring the protection of existing services.

**3.1.6 Viet Nam (Socialist Republic of)**

The adopted regulatory framework for ESIMs will facilitate the deployment of satellite and earth station technology making ESIMs the best solution for users on the move. Therefore, Viet Nam is of the view that:

* Support studies that are ongoing for the use of the bands 17.7-19.7 GHz (space-to-Earth) and 27.5‑29.5 GHz (Earth-to-space) by ESIM.
* The regulatory framework for the terminals used in ESIM should be simple and practicable such as setting forth conditions for Maritime ESIM, Aircraft ESIM and Land ESIM.

**3.1.7 China (People’s Republic of)**

China concurs with the result of ITU-R studies which indicate that there is no need for additional studies between receiving ESIM terminals and other services in the frequency band 17.7-19.7 GHz, because in which band, ESIM terminals are receiving and GSO FSS satellites that support ESIM terminals are no different from GSO FSS satellites that operate stationary FSS earth stations.

China support all the studies conducted in ITU-R WP 4A and AWG meetings and China will consider identification of the frequency bands 17.7-19.7 GHz and 27.5-29.5GHz to ESIM, under the condition that sharing and compatibility between ESIM and existing services allocated in the two bands is feasible, and the ESIM can ensure protection of, and not impose undue constraints on, services allocated in those frequency bands.

**3.1.8 Japan**

Japan supports to conduct appropriate studies in ITU-R to ensure protection of, and not impose undue constraints on FS, MS and other FSS systems.

**3.1.9 Thailand**

The global demand for broadband communications continues to be on the rise. Such demand includes requirements of connectivity for users on vessels, aircraft, train, and vehicles that operate at both fixed locations and while in motion, often in remote area.

Thailand is of the view that the regulatory issues and sharing condition/technical compatibility between ESIM and other incumbent applications such as the typical earth stations and applications in fixed service in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz should be considered to ensure the protection of existing systems. Therefore, Thailand supports the development of an ITU-R regulatory framework dealing with operation of land, maritime and aircraft applications of ESIM, also taking into account that the issue of licensing ESIM operating beyond the territory of notifying administration is not covered by the RR.

**3.1.10 Iran (Islamic Republic of)**

This Administration is of the view that the issue referred to in AI 1.5 is very complex and quite challenging, in particular regulatory and administrative aspects of the issue. However principles agreed at WRC-15 as contained in Resolution 156 (WRC-15) were considered quite relevant for issue to establish regulatory framework to address this agenda item. In addition, issue relating to circulation of ESIM, cumulative interference from ESIM to other services, determination of responsibilities between various players (Notifying administration of ESIM, Satellite operator of space station to which ESIM pertains and administration licensing ESIM on whose territory ESIM located), and other issues as contained in document APG19-2/INP-71 need to be fully studied and agreed upon. Based on the ongoing activities in the ITU-R and studies being carried out, the above preliminary views may be updated, modified as well as amended.

* 1. **Key points raised during the meeting**

Iran (Islamic Republic of) provided summary of regulatory and operational aspects of ESIM highlighting the the complexity and challenges in dealing with ESIM (aircraft ESIM, maritime ESIM and land ESIM) based on sections 12 & 13 of Annex 19 to ITU-R WP 4A Chairman's Report (see. Document APG19-2/INP/71). See also WP 3 Chairman Report APG19-2/OUT-02.

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

Taking into account Resolution 158 (WRC-15), APT Members support ITU-R studies for regulatory issues and conditions on sharing and compatibility between ESIM and existing services allocated in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz to ensure protection of, and not impose undue constraints on the existing services and their future development.

**5. Other Views**

Some APT Members are of the view that there may be no need for additional studies between receiving ESIM terminals and other services in the frequency band 17.7-19.7 GHz, because in which band, ESIM terminals are receiving and GSO FSS satellites that support ESIM terminals are no different from GSO FSS satellites that operate stationary FSS earth stations.

**6. Views from Other Organisations**

**6.1 ASMG**

The use of ESIM stations in the frequency bands 27.5-29.5 and 17.7-19.7GHz is divided into three main types: stations on ships, stations on board aircraft and earth stations. Arab states is invited to study impact of these uses on the radio services allocated in the frequency bands 27.5-29.5 and 17.7-19.7GHz with respect to different types of ESIM stations. Preliminary position in support of no change to the RR for the frequency bands 27.5-29.5 and 17.7-19.7GHz with respect to ESIM usage.

**6.2 ATU**

APM19-1 considered that protection of existing systems as per Resolution 156 is paramount.

**6.3 CEPT**

CEPT supports a regulatory framework for the operation of earth stations in motion (ESIM) in the bands 17.7-19.7 GHz and 27.5-29.5 GHz, while ensuring protection of, and not imposing undue constraints on, services allocated in those frequency bands. Due to the foreseen growing demand for ESIM and because ESIM terminals are ‘in motion’ and world-wide use, the regulatory framework for these terminals needs to be as simple and practicable as possible. The technical and operational conditions for maritime ESIM, aircraft ESIM and land ESIM need to be considered in the 27.5-29.5 GHz band.

**6.4 CITEL**

Canada and USA supports studies under the terms of Resolution 158 (WRC-15) on sharing and compatibility between ESIMs and current and planned stations of existing services allocated in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz, while ensuring protection and not imposing undue constraints on these allocated services, and to take appropriate action based on the results of these studies. Before identifying use of the frequency bands, or portions thereof, for ESIM operation studies should address each operational type of earth stations in motion to include the appropriate technical and regulatory provisions necessary to ensure protection of existing and planned allocated services. Sharing and compatibility studies between ESIM and FSS networks should include consideration of both geostationary and non-geostationary satellite systems, including non-GSO MSS feeder links, to ensure their protection.

**6.5 RCC**

The RCC Administrations consider that technical conditions and regulatory provisions shall be developed with regard to operation of ESIMs communicating with geostationary space stations in the fixed-satellite service and using frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) to provide protection, based on existing criteria, of services having allocations in these (and adjacent) frequency bands. Limitation of ESIM maximum off-axis e.i.r.p. spectral density, and other methods or their combinations, should be considered as the methods for sharing between ESIMs and GSO FSS stations and stations of other services having allocations in these frequency bands. ESIMs in the frequency bands 17.7-19.7 GHz shall not claim protection from fixed and mobile services. The RCC Administrations consider that when developing technical conditions and regulatory provisions for operation of ESIMs in the these frequency bands, special measures shall be envisaged to exclude unauthorized use of ESIMs in the territory of States that haven’t granted relevant authorizations (licenses). Regulations applicable to ESIM, which would be defined under the issue 9.1.7 of WRC-19 agenda item 9.1, shall be taken into account when developing regulations within the frameworks of WRC-19 agenda item 1.5.

**6.6 Global Mobile Supplier Association (GSA)**

GSA supports sharing and compatibility studies between earth station in motion operating with geostationary FSS and current and planned stations of existing services, in particular mobile and fixed services, to ensure protection of services allocated in those frequency bands. GSA encourages administrations and related international organizations such as ITU-R and APT to facilitate such studies. It is also of paramount importance that in order to avoid undue limitations on the mobile usage in this frequency band, the sharing and compatibility studies should be based on realistic parameters, deployment scenarios and assumptions.

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

APT Members are encouraged to consider technical and regulatory matters and submit contributions to WP4A and next APG meeting.

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