Hong Kong
24 December 2021

Asia Satellite Coalition (ASC) response to the consultation paper of the Communications Authority (CA) of Hong Kong on a class license for WLAN devices in the 6 GHz band

This submission is being made on behalf of the Asian Satellite Coalition (ASC) and its parent organization, the Asia Video Industry Association (AVIA). ASC is a pan-regional coalition of international satellite operators, whose purpose is to conduct active liaison and information exchange with Asian regulatory bodies, and regional international organizations. ASC's activities are focused principally on ensuring adequate spectrum is available for satellites to help power the continued growth and development of the Asian economies. A key part of ASC's effort is to help regulators manage spectrum and mitigate interference among various technologies which are users of adjacent spectrum.

ASC welcomes the invitation to offer its comments on the creation of a class licence for regulating the use of and trade in 6 GHz devices for Wireless Local Area Network and variation to the class licence for provision of public Wireless Local Area Network Services in the consultation paper by the Communications Authority of Hong Kong (CA) issued on 26 November 2021.

ASC notes the intent of CA to create a class license for WLAN devices operating in the 5 925-6 425 MHz band and the conditions suggested in this respect.

The 5 925-6 425 MHz band is shared between the fixed, mobile and fixed-satellite (Earth-to-space) services in all three ITU-R Regions in the ITU-R table of frequency allocations and is shared between the fixed (FS) and fixed-satellite (FSS) (Earth-to-space (uplink)) in the Hong Kong table of frequency allocations. This band is by far the most used satellite uplink band in the 4/6 GHz band with a large number of receiving space stations and numerous transmitting earth stations ranging from large teleports to corporate VSATs at customer premises, transportable Satellite News Gathering (SNG) stations and Earth Stations on-board vessels (ESVs).

ASC believes that on the right conditions and with the appropriate limitations to ensure compatibility with FSS and compliance with ITU-R studies, WLAN could successfully operate in the 5 925-6 425 MHz band.

ASC would like to draw the attention of the CA to ITU-R Report S.2367. This Report provides analyses on the interference between IMT and FSS in the 5 850-6 425 MHz band. While

recognizing that the characteristics and deployment of IMT is different from WLAN in many aspects, two important conclusions from this Report are equally applicable in respect of WLAN:

1. Transmitting WLAN devices can cause interference to receiving satellites. While one single WLAN device may not cause interference, the aggregation of the interference from all WLAN devices within the coverage diagram of a satellite can cause significant interference. For this reason, the Report concludes that tight power limitations and requirements for indoor deployment only are required to avoid undue interference to receiving satellites.

2. Transmitting earth stations can cause interference to receiving WLAN devices within a radius of several kilometers when the WLAN devices are used indoors and up to several tens of kilometers when the WLAN are used outdoors.

ASC recognizes that the only practical way to regulate the use of WLAN devices is through a class license. In doing so, it is noted that there would be no knowledge about the number of devices, their location or their individual characteristics. In this respect, it is noted that according to the ITU-R Radio Regulations, the fixed service is defined as "*a radiocommunication service between **specified** fixed points*". With no knowledge of the location of WLAN devices, defining WLAN, under a class license, to operate within the fixed service may be questioned.

In respect of interference into receiving FSS satellties, ASC notes that in §26, the CA is proposing to set out the power limits for WLAN use which are maximum equivalent isotropically radiated power of 24 dBm (250 mW) for indoor use; and 14 dBm (25 mW) for outdoor use. ASC notes that the analyses in ITU-R Report S.2367 conclude that radiated powers would need to be in the range 10-15 dBm and that deployment needs to be strictly limited to indoor use. Assuming that the potential deployment density of WLAN devices may be at least as high as that of IMT stations, the CA may want to consider, in compliance with this Report, to require WLAN devices to be for indoor use only and with a power limitation of 14 dBm.

In respect of interference into WLAN receivers, ASC emphasizes that the 5 925-6 425 MHz frequencies are a critical and most heavily used FSS uplink band. In considering a class license for WLAN devices in this band, this must not limit the development of FSS and deployment of FSS earth stations operating in the band. This includes the current VSAT use where FSS earth stations are deployed at customer premises and also the nomadic use of SNG earth stations to provide temporary links from e.g. sports or other news events. Noting the large area around transmitting earth stations where interference may be encountered, the CA need to recognize that in issuing a class license where WLAN devices are sold and deployed without any individual licensing, there will be cases where WLAN devices encounter interference from transmitting earth stations. It is therefore paramount that in the class license, it is made clear that WLAN operate on a non-protected basis and that the CA is aware that interference is likely to occur when transmitting earth stations are active in the vicinity. To mitigate this, noting that

individual earth stations will not transmit in the entire 5 925-6 425 MHz band, use of cognitive radio techniques could be encouraged for WLAN devices whereby the WLAN devices will identify frequency bands that are free from interference in the neighborhood of that device. This would also have the effect of avoiding interference between close WLAN devices.

ASC notes in the consultation paper that the CA is not considering a class license for WLAN in the 6 425-7 125 MHz band because this band, or parts of it, is considered by the CA for possible 5G services in Hong Kong subject to the outcome of WRC-23 and other considerations including co-existence with the incumbent services and frequency coordination with the neighbouring regions.

In this conjunction, ASC would like to point out that for Region 3, WRC-23 is only considering the 7 025-7 125 MHz portion of this band for possible identification for IMT (5G).

Furthermore, ASC would like to point out that just like the 5 925-6 425 MHz band, the 6 425-7 075 MHz band is allocated to FSS uplink. In particular the 6 425-7 025 MHz band is heavily used for FSS uplinks. Moreover, the 6 725-7 025 MHz portion of this band is a part of the Appendix 30B allotment Plan where all ITU Member States have an obligation to protect satellite access by all countries.

Technically, the issues related to compatibility between 5G and FSS uplinks in the 6 425-7 075 MHz band are the same as for the 5 925-6 425 MHz band and as described in ITU-R Report S.2367.

The current heavy use by the 6 425-7 025 MHz band by FSS uplinks, the Appendix 30B allotment Plan and the international obligations stemming from this and the demonstrated significant potential for interference between 5G and FSS and the required tight limitations of 5G to co-exist with incumbent services would make co-existence most challenging. As a result, 5G would need to be limited to indoor use only with tight power limitations to ensure compliance with ITU studies. Furthermore, 5G would need to accept interference from transmitting FSS earth stations as their deployment changes over time, according to demand, and would need to be required to apply interference reduction measures, e.g. use of cognitive radio techniques, to mitigate interference from transmitting FSS earth stations. Also noting that WRC-23, on its agenda, will not consider identification of the 6 425-7 025 MHz band for IMT (5G) in Region 3, ASC would advise strongly against considering use of this portion of the band for 5G.

ASC hopes this response to the consultation can assist the CA in making its decisions and expects that the points raised will be taken into account by the CA in its further consideration of this issue.