15 August 2023

The Chairman
Malaysian Communications and Multimedia Commission
MCMC Tower 1
Jalan Impact, Cyber 6
63000 Cyberjaya
Selangor Darul Ehsan
Malaysia
(Attention: Spectrum Planning and Assignment Division)

Email: npwg.sec@mcmc.gov.my

Dear Sir,

Response to proposed Malaysia's position on WRC-23 agenda items

Telesat appreciates the opportunity given by the Malaysian Communications and Multimedia Commission ("MCMC") to provide our comments on Malaysia's positions relating to the World Radiocommunications Conference 2023 ("WRC-23") Agenda Items.

With over 10 geostationary satellites[1] to deliver critical connectivity solutions to tackle the world's complex communication challenges, Telesat is one of the largest and most successful global satellite operators to date. In addition to the state-of-the-art global geostationary satellite fleet, our upcoming Low Earth Orbit network also known as Telesat Lightspeed™ will be optimized to meet the rigorous requirements of telecom, government, maritime and aeronautical customers worldwide. Operating in the Ka-band for both the user and feeder links, Telesat Lightspeed will redefine global satellite connectivity with ubiquitous, affordable, high-capacity and low-latency links.

With characteristics that can contribute to a satellite-based solution in 5G deployment regardless of the users' location, Telesat Lightspeed will play a vital role in creating an inclusive digital society by extending the reach of 5G networks to areas that will otherwise not be covered, complementing the existing fiber connectivity in rural and hard to reach areas as well as aeronautical and maritime mobility. We are pleased to share that Telesat LEO 3 satellite has been launched recently in July 2023[2] to conduct customer and vendor testing campaigns. With Telesat Lightspeed fully funded, the prime satellite manufacturer was announced on 11 August 2023[3].

[1] Telesat Telstar 18 Vantage ("T18V") satellite has footprint covering the Asia Pacific region.
[2] https://www.telesat.com/press/press-releases/telesats-leo-3-demonstration-satellite-successfully-launched/
[3] Telesat Contracts MDA as Prime Satellite Manufacturer for Its Advanced Telesat Lightspeed Low Earth Orbit Constellation. (11, August 2023, Source: https://www.telesat.com/press/press-releases/telesat-contracts-mda-as-prime-satellite-manufacturer-for-its-advanced-telesat-lightspeed-low-earth-orbit-constellation/)

Additional information on Telesat Lightspeed may be found in Annex A.

Having plans to also roll out seamless broadband satellite connectivity and possible field trials in Malaysia, Telesat would be providing comments on two WRC-23 Agenda Items which are of relevance to the impending deployment of Telesat Lightspeed – Agenda Item 1.16 and Agenda Item 1.17.

For both Agenda Items, Telesat is supportive of Malaysia's positions to adopt Method B as per CPM-23 text. Please refer to Annex B for further comments and views relating to the preferred options for Malaysia's consideration in WRC-23.

Should there be any further queries or clarifications required on any of Telesat's comments within this letter, please feel free to contact the undersigned.

Thank you.

Regards,

TELESAT

Zhi Guo, Lim (ZG)
Market Access and Spectrum Policy, Asia Pacific

ANNEX A: INTRODUCTION TO TELESAT LIGHTSPEED™

Telesat is launching Telesat Lightspeed, a revolutionary satellite constellation of highly advanced satellites in low-earth-orbit approximately 1,000 km from earth (~35 times closer than traditional satellites). The global network will deliver fiber-like throughput with low latency anywhere on earth. This is also a future-proof solution for backhauling cellular/5G traffic and providing high-speed broadband access to rural and remote communities, planes, ships, enterprise and government users, presenting vast opportunities on its applications.

Furthermore, as a highly advanced and efficient system with unparalleled economies of scale, Telesat Lightspeed will deliver to target markets at significantly lower cost compared to traditional alternatives.

The frequency bands utilized by the Telesat Lightspeed include the 17.8 – 18.6 GHz, 18.8 – 20.2 GHz bands in the space-to-Earth direction, and the 27.5 – 29.1 GHz and 29.5 – 30.0 GHz bands in the Earth-to-space direction.

Telesat Lightspeed is a highly flexible system that will dynamically allocate capacity based on demand, thus maximizing system efficiency. Each satellite in the constellation will be designed for maximum flexibility in terms of coverage (by means of **steerable beams** and **inter-satellite links**) as well as bandwidth and power assignment (by means of **onboard processing).**

Customer and vendor testing campaigns with next-generation terminals and modems are underway with the recent launch of Telesat's LEO 3 satellite on 18 July 2023.

Steerable Beams

Direct Radiating Arrays will provide independent agile beams, each with steering and forming capabilities, allowing beams to be generated where and when required based on traffic demand.

Satellite user beams will be formed using active array antennas with state-of-the-art beam-forming capability. Each satellite will have multiple independent steerable beams that enables frequency reuse. In order to serve user terminals, which may be randomly scattered across the entire field of view of the satellite, each satellite beam may hop across several different beam locations at a rate fast enough that all user terminals share full access to the satellite. Beam hopping is a powerful capability that will allow Telesat Lightspeed to efficiently serve both highly distributed and highly concentrated demand. For maximum flexibility, each beam can be assigned variable spectrum and power, in order to adjust for the local demand and spectrum regulatory constraints.

Inter-satellite Links

Multiple optical Inter-Satellite Links (“ISL”) on each satellite will connect to other satellites in the constellation enabling a highly resilient mesh network.

On-board Processing

On-board Processing will perform signal regeneration, from demodulation of received signals and re-modulation for the routing of traffic.

User Terminals and Landing Stations

A wide variety of user terminals will be designed to be compatible with Telesat Lightspeed, both electronically steered antennas terminals and mechanically tracking reflector antenna terminals.

Feeder link connectivity to all satellites will be ensured via *Landing Stations, each* consisting of full motion antennas in one site to access the satellites within that Landing Station’s field of view. Landing stations would be deployed strategically around the world.

Interference management will be carried out through the operation of Telesat’s Radio Resource Management system, which will manage the overall radio resource allocation of the entire constellation based on limits defined by the ITU/coordination agreements.

ANNEX B: COMMENTS AND VIEWS ON MALAYSIA'S POSITIONS FOR WRC-23 AGENDA ITEMS 1.16 and 1.17

Agenda Item	Comments
	Satellite Issues
1.16	Telesat is **supportive** of Malaysia's position for Method B as per CPM23-2 text. There are several options within the CPM text which would be discussed at WRC-23 and, as a guide, Telesat is supportive of Malaysia to undertake options that are viable, implementable and consistent to the regulatory framework that are developed for ESIMs communicating with GSO satellites as per Resolution **169 (WRC-19)**. On that note, Telesat seeks the Malaysia's support for the following positions: For the purpose in consistency for protection of terrestrial services operating in the frequency band 27.5-29.1 GHz and 29.5-30 GHz to those of GSO ESIM, the following options should be adopted under Annex 1 to Draft New Resolution [A116] (WRC-23): 1. For maritime non-GSO ESIMs – Part 1 **Option 1** for clause 1.2; and 2. For aeronautical non-GSO ESIMs – Part 2 **Option 2** for clause 2.1. This is because the technical and operational characteristics of the non-GSO ESIM terminals are basically identical to those of the GSO ESIM terminals. In fact, there are already manufacturers that are producing ESIM terminals that can switch seamlessly from GSO to non-GSO satellites[4]. Moreover, the elevation angle for non-GSO ESIM may be higher than that for GSO ESIM due to the availability of more choices of satellites in the non-GSO constellations. Furthermore, the power transmitted can even be lower due to the closer proximity of these non-GSO satellites to Earth.

[4] https://www.thinkom.com/ka-band-comms-on-the-move-antenna

	Another area for alignment of consistency to the GSO ESIM regulations would be not publishing a list of countries authorizing the use of non-GSO ESIM by supporting **Option 2** of Clause 5 under *instructs the Director of the Radiocommunication Bureau*. At present, there is no such precedence for other ESIMs operating in Ka and Ku bands on a similar requirement, thereby discriminating against non-GSO ESIMs operating in the Ka-band. Instead, it adds to the administrative overheads of authorizing administrations, mandating national administrations to disclose such information, and it is not effective in resolving possible cases of interference. The existing Draft New Resolution [A116] (WRC-23) contains Annex 4 which highlights the required/recommended ESIM capabilities. These ESIM capabilities, including the Network Control and Monitoring Centre ("NCMC"), are not new features and have been part of ESIM operations since 2003. As such, Annex 4 should not be part of the new Resolution under this Agenda Item. Rather, it would be more appropriate for this section to be developed as a separate ITU-R Report or Recommendation as this would apply to all ESIM operations regardless of its frequency band or the type of space station(s) it/they communicate(s) with (GSO or non-GSO). On this end, we would urge Malaysia to support **Option1** of *resolves further* 9. Lastly, while the notifying administration is responsible for resolving cases of unacceptable interference, the affected administration and authorizing administration could assist in providing additional information to facilitate the resolution of such matter to the extent possible, if they choose to do so. This is practical and has been the case for the resolution of cross-border interference cases in many countries. On this matter, Malaysia is encouraged to support *resolves* 1.3.1 to 1.3.3 **Option 2** and 1.3.4 to 1.4 **Option 2**.
1.17	Telesat is **supportive** of Malaysia's position for Method B as per CPM23-2 text. Telesat would strongly encourage Malaysia to also support the following positions/options in the CPM-23 text: 1. Limitation of satellite-to-satellite links to only certain applications that are carried out in the studies of Working Party 4A – space research, space operation and/or Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space. (support for **Option 2** for ADD 5.A117 in Article 5);

	2. For protection of terrestrial services in Annex 2 to the Draft New Resolution [A117-B] (WRC-23), support for **Option 2-2** pfd limit. This value has already been shown to protect terrestrial services as per Annex 1 to Resolution 169 (WRC-19) Part 2; 3. For protection of non-GSO space stations in Annex 4 to the Draft New Resolution [A117-B] (WRC-23), the following are strongly suggested to be supported as it is important to ensure hardware protection on board the space stations. In addition, sharing studies conducted in Working Party 4A have also proven the need to adopt the following provisions to ensure sufficient protection to space stations in LEO: - e.i.r.p. spectral density of **-17.5 dBW/Hz under (a)** for non-GSO space station transmission with antenna gains greater than 40.6 dBi to GSO; - **Option 1 under (c)** where there is no transmission for non-GSO space stations transmitting at orbital altitudes greater than 900 km and less than 1290km. The upper limit may be further revised at WRC-23 where necessary; and - On-axis e.i.r.p spectral density of **-28 dBW/Hz under c ter)**. 4. For protection of GSO space stations in Annex 5 to the Draft New resolution [A117-B] (WRC-23), Telesat would suggest for Malaysia to consider a maximum pfd of -163 dBW/m^2.