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Second Consultation on 5G Mobile Services and Networks

Dear Ms. Chia,

SES World Skies Singapore Pte Ltd (together with its affiliates, “SES”) hereby comments on the Infocomm Media Development Authority’s (“IMDA”) *Second Consultation on 5G Mobile Services and Networks* (“Second Consultation”). The Second Consultation Paper proposes to allocate several frequency bands for terrestrial 5G that are currently in use on nearly three dozen SES satellites around the world in both geostationary and non-geostationary orbit. SES fully supports the submission made on this Consultation by the Global Satellite Coalition (“GSC”) regarding each of those bands and offers only a few points of emphasis.

As explained in detail in the GSC comments,¹ IMDA is proposing to identify far too much spectrum for terrestrial 5G. In its first consultation on 5G, IMDA’s estimated that terrestrial 5G will require about 3360 MHz of spectrum in the 2022-2025 time frame, which can be met using a combination of existing and new mobile spectrum allocations. Yet the Second Consultation proposes to identify 5450 MHz of all-new spectrum in the 3.5 GHz, 26 GHz and 28 GHz bands over the same time period. The proposed supply of 5G spectrum exceeds the estimated spectrum demand by over 2000 MHz without justification. This over-allocation can be easily fixed by removing the 2000 MHz of 28 GHz band spectrum from further consideration as a terrestrial 5G band. Eliminating this band will still leave 3450 MHz of 3.5 GHz and 26 GHz spectrum as “initial wave” spectrum for 5G.

It should be noted that the 28 GHz band is not among the 33+ GHz of total spectrum being studied for IMT-2020 under WRC-19 Agenda Item 1.13. It is therefore unlikely to be internationally harmonized for terrestrial 5G. As explained in the GSC submission, in the millimetre wave bands, most countries around the world (e.g. Australia, China, Brazil, and the 28 countries of the European Union) are

¹ See Comments of the Global Satellite Coalition, *submitted in* IMDA, *Second Consultation on 5G Mobile Services and Networks* (Jul. 9, 2019).

focusing on the 26 GHz band for terrestrial 5G, since it is among the candidate bands for IMT-2020 under WRC-19 Agenda Item 1.13. Given the backing of so many countries, there can be no doubt that 5G equipment and devices will be available in the 26 GHz band. In contrast, several countries that have examined the matter closely have rejected proposals to introduce terrestrial 5G or IMT-2020 in the 28 GHz band, preferring instead to continue or expand satellite use of the band. Only a few countries (U.S., Japan and Korea) continue to push for the 28 GHz outside of the ITU WRC process.

It should be recalled, though, that the 28 GHz band was specifically excluded from consideration for IMT-2020 by WRC-15 in recognition of the fact that the satellite industry was extensively using the band to provide a wide variety of broadband satellite services, including to ships and aircraft that visit Singapore. Since 2015, more satellites have been launched using this band and many more are being planned. The SES satellites using the 28 GHz band with coverage of Singapore include the twenty-satellite O3b constellation in Medium Earth Orbit (12 launched in 2013-2014, and 8 launched in 2018-19), as well as the high-throughput SES-12 geostationary satellite launched in 2018. SES has also committed to the construction and launch of seven next-generation O3b mPower satellites into Medium Earth Orbit by 2021.

As the IMDA is aware, the O3b constellation provides high throughput broadband services to many of the major cruise ships visiting Singapore, thus enhancing Singapore's position as a regional hub for cruise liners. SES also sees a future role for 28 GHz satellites in enhancing Singapore's position as a regional hub in other respects, including as a hub for air travel and for cloud computing. Furthermore, Singapore's ambitions to become a regional leader in the space industry will also need to be supported by reasoned and balanced decisions that considers the spectrum needs of the satellite industry.

As part of this Second Consultation, IMDA has the perfect opportunity to make just such a reasoned and balanced decision. By IMDA's own estimates, terrestrial 5G will need only about 3360 MHz of spectrum in the 2022-2025 time frame. The 3.5 GHz band (200 MHz) and 26 GHz band (3250 MHz) will be more than enough to meet this estimate or any other realistic 5G spectrum demand. At the same time, the 28 GHz is being used extensively by the satellite industry to provide broadband services that serve Singapore's national interests by enhancing its position as a regional hub in key economic sectors. In such circumstances, the proper and logical outcome is to satisfy terrestrial 5G spectrum demand using the 3.5 GHz and 26 GHz bands, while preserving the 28 GHz band for satellite services.

Please contact the undersigned if you have any questions.

Yours Sincerely,

/s/

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