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Innovation, Science and Economic Development Canada

Senior Director, Space Services and International
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235 Queen Street (6th Floor, East Tower)
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Dear Sir or Madam:

Subject: Consultation on Updates to the Licensing and Fee Framework for Earth Stations and Space Stations in Canada, Canadian Gazette, Part 1, Volume 155, No. SMSE-009-21 (published Aug. 14, 2021)

Introduction

SES S.A. (“SES”) hereby submits its comments on the *Consultation on Updates to the Licensing and Fee Framework for Earth Stations and Space Stations in Canada* (Consultation) issued by Innovation, Science and Economic Development Canada (ISED) on August 14, 2021.¹

SES is a global provider of satellite and connectivity solutions headquartered in Luxembourg with operations around the world. SES provides services to broadcasters, governments, telecommunications companies, and enterprises in all parts of the world. Through its subsidiaries, SES operates a fleet of 50 geostationary (GSO) satellites in multiple frequency bands and will be launching the SES-17 satellite for transatlantic service (including service to Canada) later this month. SES is also the operator of the innovative O3b constellation of 20 high-throughput, low-latency non-geostationary (NGSO) satellites in Medium Earth Orbit (MEO). In 2021, SES will be launching its next generation of MEO satellites called mPOWER, which will provide even higher throughput and more flexibility. Together, SES’s satellites cover 99% of the world’s population. SES is also the parent company of Northern Americas Satellite Ventures, Inc., which operates the Canadian-authorized Ciel-2 satellite in the Ku-band Broadcasting

¹ Innovation, Science and Economic Development Canada, SMSE-009-21, *Consultation on Updates to the Licensing and Fee Framework for Earth Stations and Space Stations in Canada* (Aug. 2021) (Consultation), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11723.html#s10>.

Satellite Service frequencies at 129° W. SES is also authorised to operate Ku-band earth stations in motion (ESIMs) and a Ka-band gateway earth station in Canada.

SES subsidiaries have been authorised for many years to provide Fixed Satellite Service (“FSS”) in Canada in the C-, Ku-, and Ka-band frequencies from satellites at multiple orbital locations. For decades, SES has been providing competitive FSS in Canada to a wide range of users, both within and outside of Canada. Such services include: (1) the collection and distribution of U.S. and other international news, live events, and programming content to Canadian cable and IPTV providers serving over 10 million households, (2) broadband connectivity to indigenous communities in the North; (3) distribution of Canadian TV content abroad; (4) aeronautical and maritime services; and (5) connectivity for NAV Canada.

ISED’s Consultation proposes many welcome changes to Canada’s licensing and fee regime for space stations and earth stations. ISED’s proposals rectify many issues with the current apparatus-based radio licences for earth station licences and the capacity-based licence fee model. However, SES would urge ISED to continue to look for ways to improve and streamline the current satellite licensing and fee structure to ensure that it “promote[s] the effective use of spectrum”² while expanding universal connectivity³ and providing all Canadians with “an equal opportunity to participate in the digital world and will have the necessary tools to do so, including access, connectivity, literacy and skills.”⁴

SES’s responds to ISED’s questions in the Consultation as follows:

Responses to Questions

Q1 ISED is seeking comments on its proposals to:

- a. use spectrum licences to authorise fixed and transportable earth stations and ESIMs within Canadian territory, with multiple earth stations authorised under a single licence*

SES Response:

SES supports ISED’s proposal to replace radio licences with spectrum licences for fixed, transportable, and ESIM licences. As noted by ISED, satellite technologies have outgrown the current apparatus-based radio licence,⁵ and SES agrees that spectrum licences will streamline the

² See Consultation at ¶ 4.

³ *High-speed Access for All: Canada’s Connectivity Strategy* (2019), available at https://www.ic.gc.ca/eic/site/139.nsf/eng/h_00002.html.

⁴ See Consultation at ¶ 7.

⁵ See Consultation at ¶ 27.

authorisation of earth stations and will provide clarity for applicants seeking to deploy new satellite-based services in Canada.

- b. issue the proposed spectrum licences for a Tier 1 service area, and have those licences authorise the radio service and frequency bands (Tier 1 is a single national service area covering the entire territory of Canada)*

SES Response:

SES supports a Tier 1 licensing option for all earth stations, but also urges ISED to consider issuing licences for smaller Tiers at a lower cost, for satellite services that are not provided ubiquitously throughout Canada or that are subject to ISED spectrum policies that vary depending on geography. For example, the May 2021 SLPB-002-21, *Decision on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band* establishes different rules for FSS operations in the 3700-4200 MHz band in satellite-dependent and non-satellite-dependent areas.⁶ Additionally, ISED recently narrowed the locations in which FSS earth stations seeking to operate in the 27.0-28.35 GHz band can operate to areas outside the boundaries of Tier 4 service area 4-051 (Montreal), 4-077 (Toronto) or 4-152 (Vancouver); an LPC; or an MPC.⁷

To reflect ISED's current policies, SES urges ISED to allow earth station applicants to apply for a licence Tier and pay an annual licence fee that would reflect the scope of their service area. Doing so could simplify earth station deployment in these ISED-emphasized satellite service areas and provide practical licensing options for earth station operators in these bands.

In addition, ISED should want to give aeronautical or maritime ESIM operators the option of licensing distinct "offshore" or "at altitude" Tiers for their operations, at lower cost, in cases where a nationwide Tier 1 licence would exceed the intended service areas for their ESIM terminals. For example, an earth station terminal onboard a cruise ship or an offshore rig may operate only at sea and have little impact on spectrum use in populated areas. Similarly, some aeronautical ESIM operations may only require authorisation to operate while in flight over Canada.

- c. apply the general conditions of licence that are listed in annex A to earth station spectrum licences*

⁶ See ISED, SLPB-002-21, *Decision on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band* (May 2021) (C-Band Decision), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11699.html>.

⁷ See ISED, SAB-002-21, *Moratorium on the Licensing of Earth Stations in the Frequency Bands 26.5-28.35 GHz and 37.5-40.0 GHz in Certain Areas* (April 2021), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11696.html>; see also *Interim Guideline for Licensing of Earth Stations in the Fixed-Satellite, Earth Exploration-Satellite and Space Research Services in the Frequency Bands 26.5-28.35 GHz and 37.5-40.0 GHz*, Issue 2 (April 2021), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11513.html>.

SES Response:

ISED has proposed to apply the Annex A conditions for site-licenced earth stations and generic earth stations. SES does not support ISED's proposal to apply all of Annex A to generic licenced earth stations and certainly not in the same manner as for site licenced earth stations. Instead, ISED should apply a set of (to be defined) streamlined conditions to generic licences that balances compliance with the general guidelines of Section 7 of CPC-2-0-03 —

*Radiocommunication and Broadcasting Antenna Systems*⁸ – recognizing the minimal impact of smaller FSS user terminals – with the needs of satellite operators to quickly deploy generic earth stations and begin providing critical satellite connectivity.

Currently, ISED is proposing to require “all” licensees comply with the applicable technical requirements as specified in the Standard Radio System Plan SRSP-101, *Technical Requirements for Fixed Earth Stations Operating Above 1 GHz in Space Radiocommunication Services and Earth Stations on board Vessels (ESVs) Operating in the Fixed-Satellite Service*,⁹ and the procedures outlined in the Client Procedures Circular CPC-2-0-03, in addition to the other requirements specified in Annex A. SES finds this overburdensome for generic licenced earth stations. For example, CPC-2-0-03 requires applicants to undergo a public land use consultation process, which greatly delays the application process and could deter applicants seeking to quickly obtain a generic licence for service to customers.

SES proposes that ISED, instead, require generic licence applicants to submit an attestation that their proposed earth station will be deployed under a to-be-defined physical size limit, will operate in compliance with the applicable technical requirements and will comply with Section 7 of CPC-2-0-03. SES believes that such a streamlined approach for generic licence conditions will strike the right balance between establishing necessary compliance standards with enabling operators to more easily and quickly deploy new generic earth stations in Canada.

At a minimum, ISED should revise the requirements in SRSP-101 to specify their applicability to ESIMs and identical fixed earth stations. For example, a public land use consultation is surely not to be required for an aeronautical ESIMs terminal. In addition, while it is acknowledged that all transmitting earth stations must be in compliance with Safety Code 6, *Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz*,¹⁰ general characteristics of ESIMs and identical (small) fixed earth stations such as low

⁸ Client Procedures Circular CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems* (Issue 5, July 2014) (CPC-2-0-03), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08777.html>.

⁹ Standard Radio System Plan SRSP-101, *Technical Requirements for Fixed Earth Stations Operating Above 1 GHz in Space Radiocommunication Services and Earth Stations on board Vessels (ESVs) Operating in the Fixed-Satellite Service* (Issue 2, August 2019) (SRSP-101), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10823.html>.

¹⁰ *Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz* (2015) (Safety Code 6), available at

power and method of deployment (e.g., mast, roof top, aerial, etc.) would lend themselves to a limited number of simplified scenarios for demonstrating compliance. Such a set of scenarios could be part of a revised SRSP-101 where the appropriate box could be ‘ticked-off’ attesting that 50% of the limit for uncontrolled environments would not be exceeded. Such an alternative would replace the need to provide a detailed calculation proving the limit is not exceeded. Of course, in the case that any one of the available options would not apply, then a detailed calculation could be provided.

Q2: ISED is seeking comments on its proposals to:

- a. implement spectrum licences that require site approvals for all earth stations described above operating in any frequency band*

SES Response:

SES supports ISED’s proposal to require site approval for earth stations seeking to operate in bands and geographic areas where coordination is required in order to avoid harmful interference with other services, except in the bands where ISED is proposing to allow generic licensing on a no-protection, no-interference basis.¹¹

In bands or in areas where coordination is not required, site-approval would seem to serve no purpose and earth station operators should generally be allowed apply for and operate under a generic licence. For example, instead of requiring site-specific analysis for all transportable earth stations, SES encourages ISED instead to focus on whether the transportable earth station is seeking to operate in frequencies that are shared with fixed operators. If the transportable earth station operator is seeking to deploy in an FSS exclusive frequency bands and does not seek formal protected status or international recognition for the proposed earth station, then a generic licence should be obtainable and sufficient.

SES has similar concerns with ISED’s proposal to require site-approved licences for “large earth stations that may have a significant frequency impact on the immediate area.”¹² It is unclear what would qualify as such an earth station, and why “significant frequency impact” would be relevant except in bands shared with terrestrial services and/or requiring international coordination. SES suggests that ISED provide specific criteria or otherwise provide a definition for large earth stations, and to limit site approval to earth stations operating in bands requiring terrestrial or international coordination other than those in which generic licensing is being proposed on a no-protection, no-interference basis.¹³ Whether or not ISED specifies a size or

<https://www.canada.ca/en/health-canada/services/publications/health-risks-safety/limits-human-exposure-radiofrequency-electromagnetic-energy-range-3-300.html>.

¹¹ See, *infra* SES response to Q6 and Q7.

¹² Consultation at ¶ 35.

¹³ See, *infra* SES response to Q5, Q6, and Q7.

other metric to define a “large earth station”, a generic licence should be available for licensing such a station if it seeks to operate in FSS exclusive frequency bands.

- b. collect and assess the technical information listed in annex B as part of the site approval process*

SES Response:

Certain technical information is required in order for ISED to accurately determine whether a site-specific earth station can operate in a safe manner with respect to other operators. ISED proposes to collect and assess the same technical information that is currently collected for an application for a radio licence for fixed earth stations. SES urges ISED to consider making the following changes:

1. Instead of requiring applicants to provide the geographic coordinates of their proposed earth station with an accuracy of 1/1000 of a second of latitude or longitude, an accuracy of one arc second should be acceptable. At 49 degrees North latitude, one second in longitude is only about 20 m. Requiring accuracy to 1/1000 of a second would mean accuracy to within 2 cm, which is neither practical nor necessary from an interference management perspective. One arc second of accuracy should be practically sufficient to allow ISED and other operators to know where the proposed earth station will be located, while giving applicants much needed flexibility in antenna siting, e.g., to adapt antenna placement to accommodate site conditions or look angles, and to account for the accuracy of commercial GPS systems. Allowing one second of accuracy would also align with the United States Federal Communications Commission (FCC) current geographic location requirements for earth station operators in shared bands.
2. Some of the information that was required in Annex B now seems of limited relevance given the advent of Adaptive Coding and Modulation. SES recommends that ISED remove the following information from Annex B:
 - a. For transmitter information:
 - i. Where the transmit carrier is digitally modulated, the modulated bit rate in Mb/s (data rate plus any bits added as a result of overhead, i.e. the addition of coding and error correction bits)
 - b. For receiver information:
 - i. Where the receive carrier is digitally modulated, the type of modulation phases
 - ii. Where the receive carrier is digitally modulated, the number of modulation phases
 - iii. Where the receive carrier is digitally modulated, the modulated bit rate in Mbps (data rate plus any bits added as a result of overhead, i.e. the addition of coding and error correction)
3. Uplink power control is commonly practiced by satellite operators to ensure they can maintain strong, reliable links to compensate for factors such as rain attenuation. ISED should allow earth stations the flexibility to increase power to overcome the observed attenuation from atmospheric conditions on a dB-for-dB basis. The increase in power to

overcome attenuation from rain on the slant path to the satellite will also provide attenuation in other directions so that other services will continue to be protected.

- c. *require earth station licensees with site-approved spectrum licences to hold licences for entire spectrum blocks, as per relevant SRSPs*

SES Response:

SES does not support ISED's proposal to require site-approved earth station licensees to hold licences for entire spectrum blocks, which are typically defined by reference to the channel plan of a terrestrial service in the same band. The channelization of satellite services does not typically conform to the channel plans of terrestrial services and should not be required to do so given its co-equal status in the band. Earth station operators should not be required to obtain licences and pay for spectrum that it would not be using. For example, telemetry, tracking and command (TT&C) and beaconing applications, as well as certain service carriers, may require only a fraction of a larger spectrum block or range of frequencies.

If ISED does require licensees to hold a licence for entire spectrum blocks, then at a minimum, the earth station licensee should only be required to pay for the maximum bandwidth they will use within the spectrum blocks, if less than the entire block. This is a flexibility that ISED is proposing to provide to MSS earth station licensees,¹⁴ and SES would support extending the same flexibility to FSS earth station licensees.¹⁵

Q3: ISED is seeking comments on any additional technical information that should be required for site-approved earth stations. In providing comments, respondents are requested to include supporting arguments and a rationale.

SES Response:

No additional information should be required.

Q4: ISED is seeking comments on what other types of earth stations, in addition to those identified, could be subject to spectrum licences that require site approvals.

SES Response:

SES does not propose any additional types of earth stations be subject to spectrum licences that require site approvals.

¹⁴ See, *infra* SES response to Q8.

¹⁵ See, *infra* SES response to Q15 and Q18.

Q5: ISED is seeking comments on its proposal to adopt generic spectrum licences in order to authorise systems of identical fixed earth stations (blanket licences) and ESIMs.

SES Response:

SES supports ISED's proposal to adopt spectrum licences to authorise systems of identical fixed earth stations (blanket licences) and ESIMs. Generic licensing will greatly simplify authorisation of ubiquitously deployed earth stations and will also reduce administrative burdens for both applicants and for ISED.

SES would recommend that ISED go further and allow not just "identical" earth stations to be licenced in this way, but also multiple types of earth stations that are able to operate within the maximum and off-axis EIRP and EIRP density "envelopes" defined by the reference earth station described in the generic licence, and which need no greater interference protection. This will eliminate administrative burdens for earth station licensees seeking to introduce new earth stations that have no greater interference potential and require no more protection than earth stations already approved under a generic licence but are not technically identical.

Q6: ISED is seeking comments on its proposals to allow generic spectrum licensing systems of identical fixed earth stations and ESIMs in the frequency bands discussed in the consultation (Section 6.3.1).

SES Response:

For the reasons stated above, SES encourages ISED to allow the generic licence option for all frequency bands where technically feasible. ISED has identified certain bands where there have been no issues with harmful interference between services, or where specific coordination is not required between earth stations. SES addresses each of the proposed frequency bands below.

4.0-4.2 GHz (space-to-Earth): SES supports the proposal to authorise aeronautical and maritime ESIMs through generic spectrum licences in this band. However, in light of ISED's decision in the C-band Decision to stop licensing any new Fixed Service (FS) links in this band, SES urges ISED to consider issuing generic spectrum licences for fixed satellite earth stations and land ESIM terminals as well, on a non-protected basis vis a vis existing FS links. With the freeze on new terrestrial operations in this band, generic licensing is an appropriate option for earth station licensees in this band.

ISED will also have to consider how the interim authorisation regime established in the 3800 MHz decision for the 4.0-4.2 GHz band is transitioned to the new generic licensing regime in a manner that ensures the continued adjacent band protection of FSS earth stations in this band from flexible use transmitters in the adjacent 3.7-4.0 GHz band. Requiring licensees to seek ISED site approval for every site would seem overly burdensome in a priority FSS bands, but a simple voluntary registration mechanism may be useful to activate adjacent band protection.

5.925-6.425 GHz (Earth-to-space): SES supports ISED’s proposal to allow generic spectrum licensing for aeronautical and maritime ESIMs and agrees with the proposal to require site-approved licences for fixed FSS earth stations in this band. Site approval of fixed FSS earth stations in this band is recommended for the protection of co-primary FS stations.

However, SES disagrees with ISED’s stated rationale for rejecting generic licensing of fixed FSS earth stations due to the expected widespread deployment of newly introduced licence-exempt RLANs in the 6 GHz band. Licence-exempt RLANs lack status in a frequency band and are not supposed to be able to claim protection from, or constrain the deployment of, primary services such as the FSS in the same band.¹⁶ The presence of such RLAN operations in the 5.925-6.425 GHz is therefore not a valid reason for limiting the availability of generic licensing.

10.7-10.95 GHz and 11.2-11.45 GHz (space-to-Earth): SES supports the proposal to allow generic licensing for both fixed earth stations and aeronautical and maritime ESIMs on a non-interference, non-protected basis. By the same token, SES would respectfully request that ISED extend generic licensing option for land ESIMs on a non-interference, non-protected basis, as they too are not expected to have any impact on other co-primary services in this band.

10.95-11.2 GHz and 11.45-11.7 GHz (space-to-Earth): SES supports the proposal to allow generic licensing for fixed earth stations and all three types of ESIMs in this band. In addition, SES would request ISED to indefinitely extend the current moratorium on the licensing of new FS systems in the 11.075-11.2 GHz and 11.575-11.7 GHz portion of this band. There is no indication of unmet FS demand in the 10 or 11 GHz band.

11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space): SES supports the proposal to allow generic licensing for both fixed earth stations and all three types of ESIMs in these bands. The FSS is the sole primary service allocation in these bands.

12.2-12.7 GHz (space-to-Earth): SES supports the proposal to allow generic licensing for both fixed earth stations and all three types of ESIMs communicating with NGSO systems. In addition, SES requests that generic licensing be extended to fixed earth stations and ESIMs communicating with GSO systems. Just as the status of NGSO systems is recognised by footnote 5.487A, footnote 5.492 of the Canadian Table of Frequency Allocations permits FSS downlink operations (space-to-Earth) in this BSS band, “provided that such transmissions do not cause more interference, or require more protection from interference, than the broadcasting-satellite service transmissions operating in conformity with the Plan or the List, as appropriate.” SES therefore recommends that ISED allow generic licensing for earth stations communicating with GSO systems in this band in accordance with footnote 5.492.

13.75-14.0 GHz (Earth-to-space): SES supports the proposal to allow generic licensing for both fixed earth stations and all three types of ESIMs.

¹⁶ See ISED, SMSE-006-21, *Decision on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band* (May 2021) (6 GHz Decision), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11698.html>.

17.7-18.3 GHz (space-to-Earth and Earth-to-space): SES supports generic licensing of fixed earth stations, transportable earth stations and all types of ESIMs in this band in the space-to-Earth direction. SES also encourages ISED to allow generic licensing of ESIMs in this downlink band for both GSO and NGSO systems. Allowing NGSO ESIMs to obtain a generic licence in this band would align with the current policies of the European Union, and ITU frameworks adopted for GSO networks and under study for ESIMs.¹⁷

SES also encourages ISED to permit generic spectrum licensing for fixed earth stations in this band. Although FS has priority over FSS in this band, ubiquitous deployment of FSS fixed stations is feasible on a non-interference, non-protected basis while observing the PFD limits established in Article 21 of the Radio Regulations to protect fixed and other terrestrial operations. Just as for the 10.7-11.7 GHz downlink bands above, generic licensing of this FSS downlink band on a non-interference, non-protected basis would impose no constraints on any FS use of the band.

18.3-18.8 GHz (space-to-Earth) and 18.8-19.3 GHz (space-to-Earth): SES supports the proposal to issue generic spectrum licences for both fixed earth stations and all ESIMs communicating with both GSO and NGSO systems.

19.7-20.2 GHz (space-to-Earth) and 29.5-30 GHz (Earth-to-space); 28.35-28.6 GHz (Earth-to-space); 28.6-29.1 GHz (Earth-to-space); and 29.25-29.5 GHz (Earth-to-space): SES supports the proposal to issue generic spectrum licences for both fixed earth stations and all types of ESIMs communicating with both GSO and NGSO systems. Canadian footnote C16F establishes priority for the FSS over the FS in 28.35-29.1 GHz and 29.25-29.5 GHz bands, while there are no terrestrial service allocations in the 19.7-20.2 GHz and 29.5-30.0 GHz band.

27.5-28.35 GHz band (Earth-to-space): SES supports ISED's proposal to issue generic spectrum licences to aeronautical and maritime ESIMs communicating with GSO satellites in this band. SES also supports allowing generic licensing of aeronautical and maritime ESIMs in the Earth-to-space direction communicating with NGSO satellites. Considering that ESIMs communicating with NGSO FSS systems should be operated within the envelope of the characteristics and envelope of coordination of typical earth stations of the NGSO FSS, NGSO ESIMs should also be allowed to operate in this frequency band under a generic licensing regime. This will greatly simplify authorisation of ubiquitously deployed earth stations, both GSO and NGSO, and will reduce regulatory burden.

Q7: ISED is also seeking comments on any other bands that should be considered for generic spectrum licensing for fixed earth stations and ESIMs, including for systems of identical receive-only earth stations in the 4000-4200 MHz band. In providing comments, respondents are requested to include supporting arguments and a rationale.

¹⁷ See WRC-23 Agenda Item 1.16; see also ECC Decision (15)04, available at <https://docdb.cept.org/download/1496>.

SES Response:

3.7-4.0 GHz (space-to-Earth): Consistent with ISED’s recent policy set out in the May 2021 SLPB-002-21, *Decision on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band*, and Section 4(1)(b) of the Radiocommunication Act, SES urges ISED to allow continued licence-exempt operations in the 3700-4200 MHz band by eligible operators that are part of an enterprise network. In addition, ISED will have consider how interim authorisations for the protection of FSS earth stations in the 3700-4200 MHz while the band is being cleared should be transitioned (or adapted) to the new generic licensing regime.

SES also recommends that ISED allow aeronautical and maritime ESIMs to obtain generic licences for this band to operate on a non-protected basis. FSS use on a non-interference, non-protected basis would impose no constraints on any terrestrial use of the band.

4.0-4.2 GHz (space-to-Earth): See Response to Q6 above.

12.7-12.75 and 12.75-13.25 GHz (Earth-to-space): In SES’s view, the 12.7-12.75 GHz and 12.75-13.25 GHz bands are good candidates for generic licensing today, especially for aeronautical and maritime ESIMs operating on a non-interference, non-protected basis with either GSO or NGSO systems in the same band.¹⁸ Presently, it appears that there are only a small number of FS licences in these bands across Canada, and the prospect of interference into such systems is limited for maritime ESIMs offshore or aero ESIMs in flight or at airports. There is no need to wait on the outcome of WRC-23 Agenda Item 1.15, as the principles of how aero and maritime ESIMs would operate in this band are well understood and the same as in other parts of the Ku-band where such ESIMs are already allowed. Therefore, SES encourages ISED to consider allowing GSO and NGSO FSS earth stations to obtain generic spectrum licences in these frequencies.

Q8: ISED is seeking comments on its proposals to:

- a. issue generic spectrum licences for ESIMs on a no-interference, no-protection basis*

SES Response:

As noted by ISED, satellite operators are a key enabler of communications in mobility markets, particularly in-flight connectivity services and connectivity for cruise ships.¹⁹ SES supports ISED’s proposal to authorise ESIM terminals through generic licences on a no-interference, no-protection basis. Although the international framework regarding ESIMs is still evolving, adopting a generic licensing scheme will provide a level of certainty for ESIM earth station applicants and mobility service providers seeking to operate in Canada.

¹⁸ See, e.g., ITU Radio Regulations (RR) N. 5.441 (WRC-2000), effective July 17, 2000.

¹⁹ See Consultation at ¶ 45.

- b. *require ESIM licensees to provide a contact that would be available to respond to interference issues 24 hours a day, 7 days a week, as per the licence conditions in annex A*

SES Response:

No comment.

- c. *require applicants to submit technical information needed to confirm compliance with SRSP-101 when they apply for generic spectrum licences for ESIMs and for fixed earth stations intended for self-installation by consumers*

SES Response:

As noted in Q1 above, ISED should revise the requirements in SRSP-101 to specify their applicability to ESIMs and identical fixed earth stations. For example, a public land use consultation is surely not to be required for an aeronautical ESIM terminal. In addition, while it is acknowledged that all transmitting earth stations must be in compliance with Safety Code 6, general characteristics of ESIMs and identical (small) fixed earth stations such as low power and method of deployment (e.g., mast, roof top, aerial, etc.) would lend themselves to a limited number of simplified scenarios for demonstrating compliance. See response to Q1 on possible ways for streamlining the compliance with Safety Code 6. In addition, SES suggests that an update of the requirements in SRSP-101 is warranted. The requirements appear to be specifically geared to GSO earth stations but should also reference NGSO stations. The requirements in SRSP-101 should also specify their applicability to each type of earth stations including ESIMs and fixed earth stations.

Q9: ISED is seeking comments on whether an RSS should be developed for earth stations intended for self-installation by consumers.

SES Response:

SES supports ISED's proposal to develop Radio Standards Specifications (RSS) for self-installation of earth stations. SES ensures that its earth stations are professionally installed not only to satisfy customer expectations, but also to ensure that no harmful interference resulting from faulty installation is caused to (or received from) other operators. With earth stations that now can be acquired and installed directly by consumers and other end-users, it is important that standards are put in place to hold these installations to a certain standard.

Q10: ISED is seeking comments on its proposals to:

- a. *introduce spectrum licensing for space stations in all satellite services, with licences authorizing the radio service, the frequency band(s), the orbital location and a coverage area*

SES Response:

SES supports ISED's proposal to issue spectrum licences for space stations in all satellite services that will authorise the radio service, the frequency bands, and the orbital location (or NGSO orbit), and coverage area.

b. set the licence term on a case-by-case basis for satellites that are not FSS, BSS or MSS

SES Response:

No comment.

c. apply the existing conditions of licence for space stations, published as N2 – Space station licences, to the new spectrum licences

SES Response:

SES has no issues with ISED's proposal to apply the existing space station licence conditions to future spectrum licences.

Q11: ISED is seeking comments on its proposal to introduce spectrum licensing to authorise FSS feeder link and/or TT&C spectrum used by space stations to support MSS, with licences issued immediately after a favorable licensing decision and fees applicable once satellites are in operation.

SES Response:

SES supports ISED's proposal to issue spectrum licences for FSS feeder link and/or TT&C spectrum used by space stations to support MSS.

Q12: ISED is seeking comments on whether to require MSS satellite operators to comply with the rules regarding minimum holdings for FSS feeder link spectrum, as defined in RP-008. In providing comments, respondents are requested to include supporting arguments and a rationale.

SES Response:

SES supports ISED's proposal to require MSS satellite operators to comply with the same rules as FSS operators under RP-008 when accessing FSS spectrum for MSS feeder links. However, SES questions whether it is necessary to require either MSS or FSS operators to obtain licences for entire sub-bands as defined under RP-008. When spectrum licence fees are calculated on a per-MHz basis, this requirement could lead to MSS and FSS satellite operators having to pay for spectrum that will not be deployed on the satellite (e.g., due to frequency coordination or system design constraints). SES would therefore request that ISED modify RP-008 to drop the requirement for both FSS and MSS satellite operators to licence entire sub-bands. Satellite

operators should be allowed to select how much spectrum they want to licence based on their system design, and then pay only for the spectrum that is licenced.

Q13: ISED is seeking comments on its proposals to:

- a. issue spectrum licences instead of approvals in principle for MSS satellites, with fees remaining payable only once satellites are launched and operational*

SES Response:

SES supports ISED's proposal to issue spectrum licences for MSS satellites.

- b. issue spectrum licences for MSS satellites with a 20-year term*

SES Response:

SES supports ISED's proposal.

- c. issue separate spectrum licences for MSS satellites and MSS earth stations, with each licence assigned a fee*

SES Response:

SES supports ISED's proposal.

Q14: ISED is seeking comments on its proposals to:

- a. issue the three types of satellite-related spectrum licences separately and assign a separate fee for each*

SES Response:

SES supports ISED's proposal to issue three types of satellite-related spectrum licences.

- b. allow communication with multiple GSO satellites on a single earth station licence*

SES Response:

SES supports ISED's proposal to allow communication with multiple GSO satellites a single earth station licence.

- c. require separate earth station licences for NGSO systems*

SES Response:

Earth stations communicating with NGSO systems must be licenced, just like earth stations communicating with GSO systems. However, SES sees no reason in principle why a single earth station licence could not authorise communications with both GSO and NGSO systems. SES disagrees that the technical and orbital characteristics of NGSO systems are so different that a

separate earth station licence is required when the earth station operator is seeking authorisation to communicate with both NGSO and GSO systems.

Being able to communicate with both NGSO and GSO under a single earth station licence would facilitate the development of new service models. For example, SES is offering “multi-orbit” satellite service solutions that combine the benefits of GSO and NGSO systems (whether entirely in a single band or across multiple bands). Other satellite operators are planning similar services. SES is also aware that some providers are offering “Ground Station as a Service” – an offering that provides their customers with the ability to communicate with any satellite (GSO or NGSO) with which their customer has arranged to access. Moreover, some terminals for maritime ESIMs today are designed to be capable of communicating with both NGSO and GSO systems, either in the same band or in different bands, as the occasion requires. In SES’s view, an earth station licensee should not have to pay twice to use the same spectrum on an earth station simply because one of the possible points of communication is an NGSO system.

As an example of how licensing could be streamlined and avoid duplicative administrative processes, the FCC lists all of the authorised points of communication for an earth station on the one licence, whether GSO or NGSO. SES recommends that ISED adopt this approach to further simplify the Canadian earth station licensing process.

Q15: ISED is seeking comments on its proposal to assign a consumption-based fee to earth station spectrum licences, where site and station approvals are required, as follows:

- *below or equal to 1 GHz: \$2000/MHz*
- *above 1 GHz and below or equal to 3.4 GHz: \$100/MHz*
- *above 3.4 GHz and below or equal to 7.075 GHz: \$20/MHz*
- *above 7.075 GHz and below or equal to 17.3 GHz: \$10/MHz*
- *above 17.3 GHz and below or equal to 51.4 GHz: \$5/MHz*
- *above 51.4 GHz: \$1/MHz*

SES Response:

SES agrees with ISED’s proposal to abandon the current capacity-based licence fee model, which is measured by telephone voice channels or the equivalent. Satellite operations in Canada not only play a vital role in Canada’s telecommunication and broadband infrastructure, but satellites also deliver significant benefits to the Canadian economy by generating jobs and revenue and providing crucial services that support business. This is the result of significant investments made by satellite operators, including SES. The number of telephone channels equivalent to the digitally modulated channel is calculated by dividing the modulation bit rate by

64 kbps.²⁰ In effect, the more data transmitted over a given amount of bandwidth, the higher the licence fee to be paid by the operator. Such an approach penalizes the efficient use of spectrum.

ISED has proposed a consumption-based fee model to replace the current capacity-based approach. The consumption-based fee model promises to lower overall licensing costs and would eliminate the penalty for more efficient utilization of spectrum. However, while SES recognises the improvements in the proposed regime, the proposed per-MHz fee structure would still result in potentially higher earth station licensing fees in Canada than some of Canada's international peers. For example, in the U.S., an earth station licence, which could include multiple earth stations and multiple bands, is set at a fixed rate of \$595 U.S. dollars. New Zealand only charges an annual fee of about \$150 N.Z. dollars per earth station.

Thus, there is room to further reduce Canada's earth station licensing fees. In SES's view, doing so would better advance the Government of Canada's public policy goals under "Canada's Digital Charter"²¹ and "High-Speed Access for all: Canada's Connectivity Strategy" initiatives. Simply put, lowering earth station licensing fees will lower the cost of expanding connectivity via satellite and therefore make such connectivity more affordable. Such reduction is also justified because of the large amounts of frequency re-use that is possible in satellite frequencies, with multiple satellite and earth station licensees obtaining and paying for spectrum licences in the same frequency range.

When previously confronted with space station licensing fees that were significantly greater than its international peers, ISED correctly took steps to ensure that its per-MHz space station fees would not ordinarily result in equivalent Canadian licences being substantially more expensive.²² SES asks that ISED take into consideration international fee rates and ensure that the fees it ultimately adopts remain aligned with the fee rates of other administrations. SES also requests that ISED provide the same flexibility to FSS earth station licensees as it is proposing to provide to MSS earth station licensees, whereby the fee would be calculated "based on the maximum amount of spectrum a system is capable of using, within a range of possible operation."²³ Thus, an earth station can be licenced for a range of frequencies, say 14.0-14.5 GHz or 29.5-30.0 GHz, but then only pay for the maximum amount of spectrum within that range that will be used (e.g. 36 MHz or 100 MHz, as appropriate for the licensee's needs).

²⁰ See Radiocommunication Regulations (SOR/96-484), December 11, 2011, Part III, Section 58(c), available at <https://laws-lois.justice.gc.ca/eng/regulations/sor-96-484/page-6.html#h-1001994>.

²¹ Canada's Digital Charter: Trust in a digital world, available at https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00108.html.

²² See ISED, SMSE-021-14, *Fee Proposal for Fixed-Satellite Service (FSS) and Broadcasting-Satellite Service (BSS) Satellite Spectrum in Canada* (Feb. 2016), available at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11159.html>.

²³ See, *infra* SES Response to Q18.

This flexibility is being offered to the MSS on account of the “complex coordination environment” in the MSS bands (e.g. the Region 2 Memorandum of Understanding governing the L-band MSS). However, this flexibility can also be very useful for FSS earth station operators. Modern FSS systems are very flexible and can switch the frequencies used to serve a particular end user rapidly in real-time, without necessarily increasing the amount of spectrum usage. Even on older FSS systems, manual “regrooming” of transponders – whereby existing services are moved from one transponder to another without increasing the amount of spectrum used – takes place routinely. Having a licensing option that calculates the fee based on a maximum amount of spectrum use within a broader range would provide FSS operators and their customers with much needed convenience and flexibility without the high cost of requiring a licence that covers the entire broader frequency range.

Q16: ISED is seeking comments on its proposal to assign a consumption-based fee to generic earth station spectrum licences for fixed earth stations and ESIMs at the rate of \$5/MHz.

SES Response:

As discussed above, SES recommends that ISED set lower generic spectrum licence fees in order to better advance its public policy goals of connecting the unconnected via satellite. Lowering such fees will also help Canada maintain international competitiveness with its international peers. For a generic licence, ISED should charge no more than the lowest fee for a site-approved licence since no site analysis is required for the grant. In bands where a generic licence authorises only operations on a non-interference, non-protected basis, ISED should charge only the minimum licence fee to reflect the lesser status, and therefore value, of the licenced spectrum.

Q17: ISED is seeking comments on its proposal to modify the existing consumption-based fee for spectrum licences for MSS earth stations operating in bands allocated to MSS as follows:

- *at or below 3 GHz: \$1500/MHz*
- *above 3 GHz: \$5/MHz*

SES Response:

SES supports lower satellite fees overall for both FSS and MSS earth station licensing. Regarding the MSS fee structure, SES notes that it is different from FSS fee structure. It is possible that, in some bands, there may be both an FSS and MSS allocation, and ISED would have to consider whether the different structures result in different fees and whether any such difference is justified.

Q18: ISED is seeking comments on its proposal to assign the spectrum licence fee for MSS earth stations based on the maximum amount of spectrum a system is capable of using, within a

range of possible operation. This amount would be the assigned spectrum used in the fee calculation.

SES Response:

SES supports ISED's proposal and requests that the same flexibility be extended to FSS earth stations.²⁴

Q19

ISED is seeking comments on its proposals to:

- a. modify the MSS satellite spectrum licence fee to \$124.84/MHz*
- b. assign a consumption-based fee for new spectrum licences for all other satellites (that are not FSS, BSS or MSS) at \$124.84/MHz*

SES Response:

SES supports ISED's proposal to make the per-MHz fee consistent across all satellite services.

Q20: ISED is seeking comments on its proposals to:

- a. introduce a two-step fee for space station spectrum licences for constellations of NGSO satellites in any satellite service that are subject to phased deployment milestones*
- b. apply the first fee step currently at \$62.42/MHz from the launch of the first satellite up until the deadline for the first deployment milestone (typically year 6). The second fee step, currently at \$124.84/MHz, would apply thereafter and would continue until the end of the licence term, recognizing that all annual fees will increase over time, according to the CPI*

SES Response:

No comment.

Q21: ISED is seeking comments on its proposals to introduce a minimum annual spectrum licence fee of \$160 for earth stations and \$300 for space stations, and to apply these fees whenever the application of the consumption-based fee model would result in a fee lower than those amounts.

SES Response:

SES has no issues with ISED's proposal to adopt a minimum annual spectrum licence fee for earth stations and space stations. As indicated in Response to Q17 above, SES requests that the

²⁴ See, *supra* SES Response to Q15.

minimum earth station licensing fee be applied to generic licences that authorise earth stations to operate only on a non-interference, non-protected basis in order to reflect the lesser status, and therefore value, of the licenced spectrum.

Q22: ISED is seeking comments on its proposal to apply a minimum annual spectrum licence earth station fee of \$160 to radioastronomy sites.

SES Response:

SES supports ISED's proposal.

Q23: ISED is seeking comments on its proposals to introduce developmental spectrum licence fees for earth stations and space stations at a flat rate of \$160 and \$300, respectively.

SES Response:

SES supports ISED's proposal, on the assumption and understanding that developmental spectrum licences would only authorise non-commercial operations.

Q24: ISED is also seeking comments on limits to eligibility requirements for developmental spectrum licences, limits on frequency bands where developmental licences could be issued, and conditions of licence that could be applied. In providing comments, respondents are requested to include supporting arguments and a rationale.

SES Response:

No SES comment, on the assumption and understanding that developmental spectrum licences would only authorise non-commercial operations.

Q25: ISED is seeking comments on its proposal to apply a prorated fee, of 1/12th of the relevant annual fee for each month until March 31 of the fiscal year, for licences issued part-way through a licensing year.

SES Response:

SES supports ISED's proposal.

Q26: ISED is seeking comments on its proposals to:

- a. issue short-duration licences for periods of less than one year*
- b. assign a prorated fee of 1/12th of the total annual fee per month, with the lowest fee possible being \$160 for earth stations and \$300 for space stations*

SES Response:

SES supports ISED's proposals.

Q27

ISED is seeking comments on its proposals to set service standards for the issuance of licensing decisions for satellite-related spectrum licences as follows:

- *space stations: 126 days*
- *generic earth stations: 126 days*
- *site-approved earth stations: 126 days*
- *additional sites under an existing site-approved earth station licence: 49 days*

SES Response:

SES supports ISED's proposals to shorten the maximum service times for processing all types of applications, and recommends that ISED set even shorter processing times for developmental and short-duration licences in keeping with their short-term nature.

SES commends ISED for their usual practice of processing satellite-related applications in much less time than the maximum processing times. SES can only encourage ISED to continue finding ways to streamline and improve the average service times for such applications going forward.