January 21, 2019

VIA E-MAIL

Director
Space Services Planning
Innovation, Science and Economic Development Canada
235 Queen Street
Ottawa, Ontario K1A 0H5
Email: ic.spectrumengineering-genieduspectre.ic@canada.ca

Dear Sir or Madam:

RE: ***Consultation on the Utilization of the Bands 18.8-19.3 GHz and 28.6-29.1 GHz, and the Bands 17.3-17.7 GHz, 19.3-19.7 GHz and 29.1-29.25 GHz by the Fixed-Satellite Service* - Notice No. SMSE-016-18, *Canada Gazette*, Part I, posted on October 25, 2018**

I. Introduction

1. Hughes Network Systems Canada ULC ("Hughes Canada") and its parent company, Hughes Network Systems, LLC, (collectively, "Hughes), are pleased to submit these comments in connection with the proceeding initiated by the Department of Innovation, Science and Economic Development Canada's (the "Department") *Consultation on the Utilization of the Bands 18.8-19.3 GHz and 28.6-29.1 GHz, and the Bands 17.3-17.7 GHz, 19.3-19.7 GHz and 29.1-29.25 GHz by the Fixed-Satellite Service*, Notice No. SMSE-016-18 (the "Consultation Document").

2. As a leading satellite provider of broadband services with more than 1.3 million subscribers in the Americas, Hughes has experienced first-hand the tremendous growth in demand for satellite broadband connectivity and the opportunities and challenges that this presents for the satellite industry. As the Department notes in the Consultation Document, next-generation geostationary orbit ("GSO") satellites and non-geostationary orbit ("NGSO") satellites are expected to play an important role in enabling broadband connectivity and delivering affordable broadband globally, including in remote and rural areas.[1]

3. In order to meet the growing demand for satellite broadband services, commercial satellite operators must continue to innovate and improve the performance and spectral efficiency of their satellites. More

[1] Innovation, Science and Economic Development Canada (the "Department"), *Consultation on the Utilization of the Bands 18.8-19.3 GHz and 28.6-29.1 GHz, and the Bands 17.3-17.7 GHz, 19.3-19.7 GHz and 29.1-29.25 GHz by the Fixed-Satellite Service,* No. SMSE-016-18, October 2018 (the "Consultation Document"), para. 6.

importantly, satellite operators need access to significantly more bandwidth (spectrum).This includes the bands 18.8-19.3 GHz and 28.6-29.1 GHz that are the subject of this proceeding.

4. In recognition of these trends, Hughes supports the Department's proposal to (i) give co-primary status to both GSO networks and NGSO systems in the FSS in the 18.8-19.3 GHz and 28.6-29.1 GHz bands; and (ii) amend the Canadian Table of Frequency Allocations ("CTFA") to allocate the bands 18.8-19.3 GHz and 28.6-29.1 GHz for use by both GSO networks and NGSO systems in the FSS on a co-primary basis. The proposal is an equitable solution that will ensure that the spectrum bands are available for both GSO and NGSO broadband services. GSO and NGSO operators have demonstrated that they can enter into negotiated coordination agreements in good faith to accommodate each other's operations.

II. Overview of EchoStar/Hughes

5. Hughes Canada's ultimate parent company, EchoStar Corporation ("EchoStar"), is the fourth largest commercial GSO satellite operator in the world. EchoStar owns, operates, and manages a fleet of 23 GSO satellites, which provide broadcast, fixed, and mobile satellite services throughout the Americas and Europe.

6. Hughes Canada's parent company, Hughes Network Systems, LLC, is the largest provider of satellite broadband services in North America and globally, with approximately 1.3 million subscribers across the Americas. Hughes provides its broadband services using a three satellite, Ka-band GSO constellation over North America, which includes coverage of key portions of Canada. In December 2016, Hughes launched the EchoStar XIX/Jupiter 2 satellite, a high throughput GSO satellite employing a multi-spot beam, bent pipe Ka-band architecture. With the addition of the EchoStar XIX/Jupiter 2, Hughes introduced its new HughesNet Gen5 satellite Internet service in March 2017; delivering faster speeds, more data, and built-in Wi-Fi for consumers and small businesses across the continental United States, Southeastern Alaska, Puerto Rico, the U.S. Virgin Islands, Mexico, Colombia, Ecuador, and key areas within Canada.

7. Hughes is currently in the process of constructing its U.S.-licensed next-generation, Ultra High Density Satellite, EchoStar XXIV/Jupiter 3, which is being manufactured by Space Systems Loral and is planned for launch and commercial service in early 2021. The EchoStar XXIV/Jupiter 3 satellite will be used to provide state-of-the-art satellite broadband services and capacity to customers throughout the Americas, including Canada, at speeds at or above 100 Mbps.

8. In Canada, Hughes provides broadband services to both enterprise customers and wholesale partners, such as Xplornet Communications Inc. ("Xplornet"), which makes use of Ka-band capacity

on the EchoStar XVII/Jupiter 1 and EchoStar XIX/Jupiter 2 satellites to provide high speed broadband services to consumers in Canada, including those located in remote and underserved areas of the country.

9. EchoStar (and its subsidiary Hughes) is also one of the largest, if not the largest, user and purchaser of Canadian satellite capacity, including leases of capacity on Ciel-2 at 129W, Anik F3 at 118.7W, Nimiq 5 at 72.7W, and the Telstar 19 VANTAGE at 63W.

10. In addition to its broadband services, Hughes designs, manufactures, and provides gateway and terminal equipment to customers for other satellite systems. As a result of Hughes' global leadership in the development and provision of satellite solutions, Worldvu Satellites Limited d/b/a OneWeb has selected Hughes to develop the ground system, including gateways and user terminals, for its global low earth orbit ("LEO") satellite constellation. OneWeb's mission is to enable affordable high-speed, low latency Internet service access to everyone, even the most remote and rural locations of the globe. By partnering with OneWeb, Hughes is facilitating broadband connectivity to regions of the world that are outside of the sight of equatorial orbit satellites and economically or physically infeasible for terrestrial networks, such as the arctic regions of Canada.

III. Discussion

Question 1: ISED is seeking comments on the proposal to give co-primary status to both GSO networks and NGSO systems in the FSS in the bands 18.8-19.3 GHz and 28.6-29.1 GHz.

11. Hughes supports the Department's proposal to give co-primary status to both GSO networks and NGSO systems in the FSS in the bands 18.8-19.3 GHz and 28.6-29.1 GHz (*i.e.*, Option 1).[2] Hughes agrees with the Department that Option 1 will provide business continuity and regulatory certainty for existing GSO networks and NGSO systems operating in these bands and that co-equal treatment of GSO networks and NGSO systems will increase the potential for new and innovative communication services in rural and remote areas of Canada.[3]

12. As the Department notes in the Consultation Document, co-equal treatment of GSO networks and NGSO systems aligns with Canada's current practice.[4] Since 2010, the Department has issued satellite authorizations to both existing and planned GSO and NGSO operators in the FSS for use of Ka-band spectrum.[5] It has also issued authorizations for gateway stations and subscriber terminals.

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2 ***Ibid.*** paras. 26 and 27.

3 ***Ibid.*** para. 30.

4 ***Ibid.*** para. 27.

5 ***Ibid.*** para. 15.

During this time, both GSO-FSS and NGSO-FSS satellites using these bands have been (or are planned to be) deployed.[6] Hughes is confident that the Department's proposal to give co-primary status to both GSO networks and NGSO systems in the 18.8-19.3 GHz and 28.6-29.1 GHz bands will continue to promote the entrance and deployment of innovative GSO and NGSO satellite communications solutions in the Canadian market.

13. The Department's proposal also aligns with international practice. Internationally, the 18.8-19.3 GHz and 28.6-29.1 GHz bands are designated by the International Telecommunications Union (the "ITU") for use by both GSO networks and NGSO systems in the FSS on a co-primary basis.[7] In particular, Article 5.523A of the ITU *Radio Regulations* states that bands 18.8-19.3 GHz and 28.6-29.1 GHz may be used by both GSO and NGSO FSS systems, subject to the coordination rules of Article 9.11A of the ITU *Radio Regulations*.[8] Option 1 will promote harmonization with international allocation rules and ensure that spectrum coordination and sharing between GSO-FSS and NGSO-FSS systems will be in accordance with ITU coordination rules and ITU date priorities.

14. Harmonization of Canadian regulations with ITU rules is particularly important considering the global nature of NGSO systems. Option 1 will provide greater certainty to GSO and NGSO operators that operate globally in the FSS in the bands 18.8-19.3 GHz and 28.6-29.1 GHz and already coordinate their networks under current ITU rules. The current international practice of GSO-NGSO coordination promotes the efficient use of the spectrum and facilitates the operation of multiple GSO systems and NGSO systems globally.

15. Furthermore, co-primary status would not place any additional burden on NGSO operators. In order to comply with existing ITU allocations and coordination rules in other portions of the Ka-band, NGSO systems are designed to accommodate and coordinate with GSO FSS networks. [9]

16. Hughes therefore submits that the Department's proposal to give co-primary status to GSO networks and NGSO systems is the appropriate option. Option 1 will promote the most efficient use of the spectrum by allowing GSO and NGSO systems, which both offer great potential for delivering high-

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6 See the Department, *Authorized and Approved Canadian Satellites,* https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf05343.html, date modified: 12 September 2018; and the Department, *List of foreign satellites approved to provide fixed-satellite services (FSS) in Canada,* https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf02104.html, date modified: 22 June 2018.

7 International Telecommunications Union ("ITU"), *Radio Regulations,* Edition of 2016, at RR5-119.

8 ***Ibid.*** at RR5-120, Article 5.523A.

9 See, for example, Space Exploration Technologies Corp., "Comments", *Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G,* Notice No. SLPB-005-18, 5 July 2018, Attachment A – Technical Information to Supplement Schedule S, pp. 36 to 42, where SpaceX states that its NGSO system has been designed to provide interference protection to GSO satellite networks in both the Ku band and Ka band and describes coordination of its NGSO system with GSO satellite networks.

speed Internet connectivity and innovative services and applications to Canadians, to operate in the 18.8-19.3 GHz and 28.6-29.1 GHz spectrum bands. This will help to ensure that both GSO and NGSO operators will have sufficient capacity to meet the growing demands for broadband satellite services.

Question 3: Is there additional information on coordination practices for GSO networks and NGSO systems in the FSS that should be considered? If so, please explain in detail.

17. The Department is of the view that the existing approach to domestic coordination between GSO networks and NGSO systems is sufficient to address any coordination disputes:[10]

    a. The Department will continue to apply the ITU's general coordination practices and date priorities, including using the domestic authorization date to establish the date of regulatory precedence.[11]

    b. Both GSO and NGSO operators are expected to negotiate in good faith to accommodate each other's operations;[12] and

    c. Licensees must comply with conditions of licence, which require licensees to undertake coordination activities, state that the Department may impose the implementation of mitigation techniques, and require licensees to comply with all measures imposed by the Department, such as spectrum sharing and frequency segmentation.[13]

18. In the Consultation Document, the Department notes that it will be publishing additional information on its domestic coordination approach and invites interested parties to provide information on coordination practices for GSO networks and NGSO systems in the FSS that the Department should consider.[14]

19. As the Department assesses what additional domestic coordination mechanisms (if any) may be necessary, the Department should consider existing international coordination practices between GSO and NGSO operators in the FSS. In particular, Hughes notes that GSO networks and NGSO systems operating in portions of the Ka-band spectrum that are not subject to Article 22.2 of the ITU *Radio Regulations*, such as the 18.8-19.3 GHz and 28.6-29.1 GHz spectrum bands, are entering into negotiated coordination agreements in good faith to accommodate each other's operations.

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10 The Consultation Document, para. 43.

11 ***Ibid.*** para. 42.

12 ***Ibid.***

13 ***Ibid.*** para. 43.

14 ***Ibid.*** para. 43.

20. Notably, in these coordination agreements, NGSO operators generally agree to comply with the interference protection requirements under Article 22 of the ITU *Radio Regulations*, including the EPFD limits, even though the frequency bands are not subject to these requirements. NGSO operators agree to comply with the limitations because, as noted above, NGSO systems are being designed to accommodate both Ka-band and Ku-band GSO networks and to provide appropriate GSO interference avoidance mechanisms in order to comply with Article 22 of the ITU *Radio Regulations*. These mechanisms are implemented throughout the full bandwidth in which the NGSO systems will operate. Accordingly, there is no additional burden on NGSO systems to agree to these measures in their coordination agreements with GSO networks when operating in bands that are not subject to Article 22 of the ITU *Radio Regulations*.

Question 5: ISED is seeking comments on the proposed changes to the CTFA. In providing responses, include supporting arguments for or against the proposed changes.

21. Hughes supports the Department's proposed changes to the CTFA. In particular, Hughes supports the Departments proposal to amend the CTFA to designate the bands 18.8-19.3 GHz and 28.6-29.1 GHz for use by both GSO networks and NGSO systems in the FSS on a co-primary basis. This change would be consistent with Option 1 discussed above.

Question 6: ISED is seeking comments on the above proposed changes to the CTFA. In providing responses, include supporting arguments for or against the proposed changes.

22. Hughes supports the Department's proposed changes to the CTFA to permit FSS (space-to-earth) use in the 17.3-17.1 GHz band and to allow the use of the bands 19.3-19.7 GHz and 29.1-29.25 GHs by GSO FSS networks for low-density deployments of earth stations.

23. These amendments will provide more flexibility to GSO FSS systems while ensuring that existing services are protected by limiting the use of the band by GSO FSS to low-density applications such as gateways and feeder links.

IV. Conclusion

24. Hughes supports the development of a utilization policy for use of the bands 18.8-19.3 GHz and 28.6-29.1 GHz, and for the bands 17.3-17.7 GHz, 19.3-19.7 GHz and 29.1-29.25 GHz, in Canada. Regulatory certainty is needed with GSO and NGSO operators increasingly relying on Ka-band spectrum to deliver high-speed satellite broadband services and solutions.

25. In particular, Hughes supports the Department's proposal to give co-primary status to GSO networks and NGSO systems in the FSS in the bands 18.8-19.3 GHz and 28.6-29.1 GHz. This approach aligns with Canada's current practice and is consistent with existing international allocation and coordination requirements. Hughes also notes that internationally, GSO and NGSO operators are entering into negotiated coordination agreements with each other in good faith to accommodate each other's FSS operations in the Ka-band.

26. Hughes thanks the Department for the opportunity to participate in this proceeding and looks forward to reviewing the comments of the other parties.

[Original signed by Jennifer Manner]

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