Telesat
1601 Telesat Court
Ottawa, CANADA
K1B 5P4

August 3, 2017

FILED ELECTRONICALLY VIA IBFS

Mr. Jose P. Albuquerque
Chief, Satellite Division- International Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Re: Telesat Canada, Petition for Declaratory Ruling Requesting Access to the U.S. Market for Its Non-Geostationary Orbit Constellation, Call Sign S2976
Ex parte, File No. SAT-PDR-20161115-00108

Dear Mr. Albuquerque:

Telesat Canada ("Telesat") hereby submits this *ex parte* response to certain arguments in the "Reply Comments"[1] submitted by WorldVu Satellites Limited ("OneWeb"). The Reply Comments address Telesat's above-referenced Petition for Declaratory Ruling ("Petition") requesting access to the U.S. market for its non-geostationary orbit ("NGSO") Ka-band system.

Telesat demonstrates below that OneWeb's concerns regarding Telesat's compliance with the ITU's EPFD limits are baseless. Telesat also shows that OneWeb's assumptions about the deficiencies of Telesat's showing of U.S. coverage are incorrect and its claims about the sufficiency of Telesat's orbital debris mitigation showing are baseless. The Commission, therefore, should reject OneWeb's arguments and grant Telesat's Petition without further delay.

[1] Reply Comments of WorldVu Satellites Limited, File No. SAT-PDR-20161115-00108 (July 14, 2017) ("OneWeb Reply").

A. OneWeb's Suggestion that Telesat Would Operate with EPFD Levels that Exceed ITU Limits is Unfounded.

In its Reply Comments, OneWeb alleges that other NGSO licensees will be disadvantaged by permitting Telesat to operate with EPFD levels that in OneWeb's view exceed the ITU limits. Since Telesat complies with the ITU limits, there is no basis for OneWeb's concern. Telesat has designed its constellation to meet the ITU EPFD limits and has provided the required data to the ITU Radiocommunication Bureau (BR). Telesat expects a favorable finding from the ITU in due course.

In any event, with respect to ITU EPFD compliance, Telesat will accept a comparable condition on a grant of its Petition as the Commission specified in its grant of OneWeb's U.S. market access petition. That condition is:

> "Prior to initiation of service, OneWeb must receive a favorable or "qualified favorable" finding in accordance with Recommendation 85 (WRC-03) with respect to its compliance with applicable EPFD limits in Article 22 of the ITU Radio Regulations."[2]

Beyond that, the "critical geometries" which OneWeb alleges Telesat has ignored[3] have been taken into account when generating the PFD and EIRP mask data[4] that Telesat has provided the ITU with in accordance with the provisions of Resolution **85** (WRC-03) and thus will be considered by the ITU when it analyzes Telesat's conformance with the relevant EPFD limits. While Telesat disputes OneWeb's interpretation of ITU EPFD requirements,[5] there is no need to engage in a further back

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[2] *See WorldVu Satellites Limited, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System*, IBFS File No. SAT-LOI-20160428-00041, Order & Declaratory Ruling, FCC 17-77 (rel. June 23, 2017) ("OneWeb Grant"), at ¶ 24.d. Telesat noted what appears to be a typographical error in the quoted OneWeb condition; we believe that the reference in the condition to "Recommendation 85 (WRC-03)" is intended to mean Resolution 85 (WRC-03). *See* Telesat Canada's Response to Comments of WorldVu Satellites Limited, File No. SAT-PDR-20161115-00108 (July 7, 2017) ("Telesat's Response to OneWeb"), at 16 and n.27.

[3] *See* OneWeb Reply at 2-3.

[4] That is, the data elements under §A.14 of Appendix 4 of the ITU Radio Regulations.

[5] Among other defects in OneWeb's analysis, OneWeb misstates the ITU standard for evaluating Telesat's EPFD showing by suggesting that Telesat must meet the strictest of the EPFD limits, $-190.4\ dB$(W/m2/40 kHz), for 100% of the time. That is not the case. Rather, the ITU permits this limit to be exceeded by certain amounts for specified percentages of the time. For example, in the case cited by OneWeb, the $-190.4\ dB$(W/m2/40 kHz) value may be exceeded by 9 dB for up to 9% of the time, or by 20 dB for up to 0.2% of the time. *See* ITU-RR Article 22, Table 22-1C, 90 cm antenna. As demonstrated in Telesat's Response to OneWeb's original Comments on Telesat's Petition - in fact in the very graph reproduced by OneWeb in its Reply - Telesat will comply with the ITU's EPFD limits in the very example cited by OneWeb. *See* Telesat Canada's Response to Comments of WorldVu Satellites Limited, File No. SAT-PDR-20161115-00108 (July 7, 2017), at 17-19 and OneWeb's Reply at 5.

and forth with OneWeb on this issue. The matter of Telesat's compliance with ITU EPFD requirements will be resolved by the ITU's finding.

B. *Telesat's NGSO Constellation Complies Fully With The Commission's Domestic Coverage Requirement*

OneWeb claims Telesat cannot meet the Commission's domestic geographic coverage requirement. OneWeb simply is wrong.

First, OneWeb used only the 19.7 – 20.2 GHz band in its coverage calculations. The 19.7 – 20.2 GHz band has the strictest EPFD limits which results in larger discrimination angles and therefore less coverage. The Telesat NGSO constellation also uses the 17.8 – 18.6 GHz and the 18.8 – 19.3 GHz bands. In particular, the 17.8 – 18.6 GHz band, including the 18.3-18.6 portion thereof, has smaller discrimination angles due to the less stringent ITU EPFD limits.[6]

Second, OneWeb's argument is based on discrimination angles that are not representative of Telesat's operations.[7] The discrimination angles OneWeb used in its coverage calculations came from Telesat's example of how it could comply with the ITU's EPFD requirements even in conditions that are "worst case" from an EPFD perspective. The conditions Telesat chose are, in fact, hypothetical "worst case" as it is impossible for some of them even to occur in the United States.[8] It is simply incorrect to

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[6] As mentioned, the Telesat system is designed to operate in the 18.8 – 19.3 GHz band as well. That band is subject to the provisions of No. 9.11A of the ITU Radio Regulations and No. 22.2 does not apply. Therefore, discrimination angles can be calculated once the results of coordination with applicable networks and systems is known.

[7] Petition, Appendix A, Technical Exhibit at 16-17.

[8] Telesat made the following assumptions in its example calculation of discrimination angles; these assumptions are not representative of either actual operating conditions or the parameters used to establish EPFD compliance in accordance with Article 22:

> 1) That the GSO earth station would receive the same interfering power from the two satellites that Telesat assumed would be simultaneously transmitting during handover. This is not possible, as not only do the slant ranges and propagation conditions differ between the GSO earth station and each of the two satellites, but the GSO earth station antenna will provide isolation with respect to the ascending of the two satellites;
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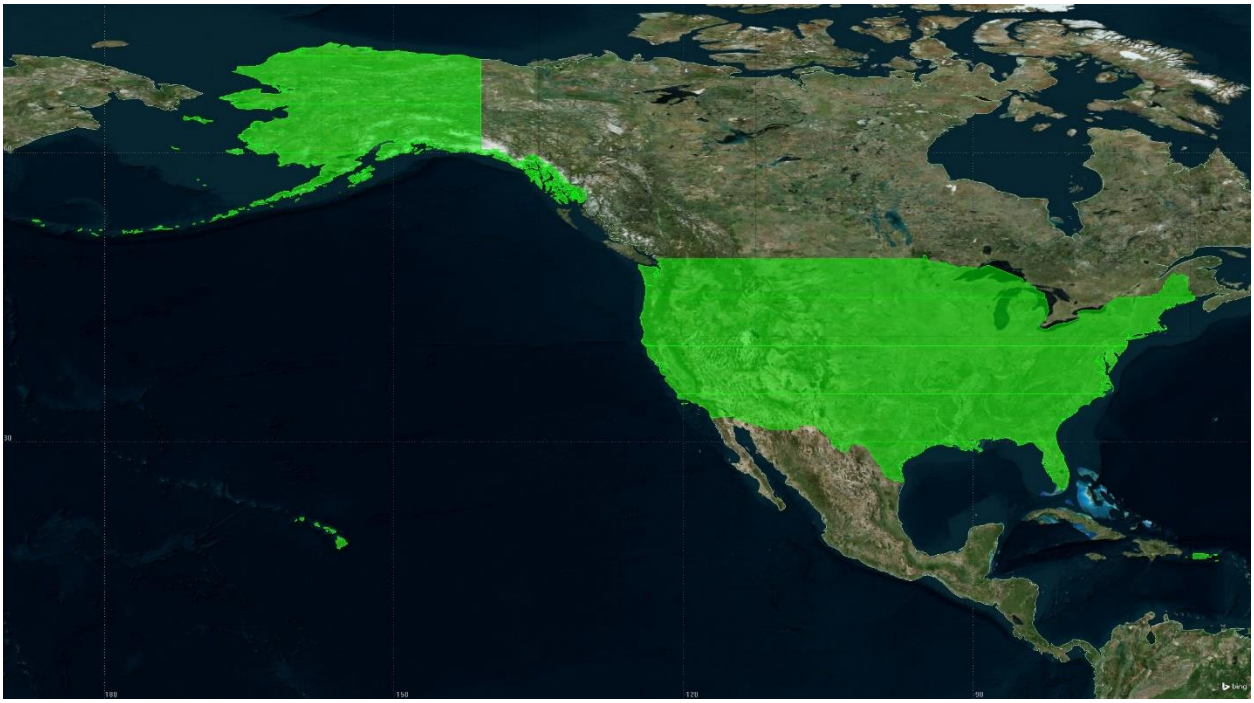
> 2) That the slant range would be equal to the orbit radius, which is true at the equator but is impossible for U.S. coverage purposes because the U.S. territory Telesat is required to cover all lies above the equator. The larger the slant range, the smaller the discrimination angles; and
>
> 3) That the NGSO and GSO earth stations would be effectively co-located, which is a worst case situation.

take those worst case discrimination angles and transform them into the basis for a U.S. coverage evaluation.

Figure 1 below shows the U.S. coverage of Telesat's NGSO constellation while operating in, for example, the 18.3 – 18.6 GHz band with actual operating conditions.[9] The figure shows that Telesat complies with the Commission's U.S. coverage requirement. Telesat derived the figure, moreover, by using operating parameters that are in fact more stringent from a coverage perspective than the operating parameters used by Telesat to generate the PFD and EIRP mask data already provided to the ITU in accordance with the provisions of Resolution 85 (WRC-03). In particular, in calculating coverage below, Telesat used larger discrimination angles and lower power levels to calculate coverage than it used to calculate ITU EPFD compliance.

Figure 1: Telesat NGSO Constellation User Coverage for actual operations in the 18.3 – 18.6 GHz band



Accordingly, OneWeb's questioning of Telesat's compliance with the Commission's coverage requirements is fatally flawed.

[9] Forward Link downlink operated with a 2.5 dB back-off, and taking into account the real slant ranges.

C. *Telesat Has Provided All Necessary Information Regarding Its Plans to Mitigate Against the Risks of Orbital Debris.*

Telesat has provided all necessary information regarding orbital debris mitigation. In its Petition, Telesat made a showing that is responsive to the Commission's orbital debris mitigation rules. The Commission asked Telesat to elaborate on certain elements of its showing; Telesat responded. In its initial Comments on Telesat's Petition, OneWeb raised questions about portions of Telesat's showing. Although arguably unnecessary, Telesat responded fully to those questions, too. OneWeb's Reply Comments provide no basis for requiring additional mitigation information from Telesat.

Similarly, Telesat already has shown OneWeb's proposal for a 125 km "buffer zone" between constellations to be unsupported and unwarranted.[10] OneWeb's Reply Comments provide no basis for departing from the physical coordination approach the Commission took with respect to OneWeb. The Commission conditioned OneWeb's grant on a requirement that OneWeb "coordinate physical operations of spacecraft with any operator using similar orbits, for the purpose of eliminating collision risk and minimizing operational impacts."[11] A comparable condition should attach to Telesat's grant.

As shown above, OneWeb's concerns regarding Telesat's NGSO constellation are misplaced and should be summarily rejected by the Commission. Telesat's Petition should be granted without further delay.

Very truly yours,

/s/ _____
Elisabeth Neasmith
Director, Spectrum Management and Development

Of Counsel:
Henry Goldberg
Joseph A. Godles
Jonathan L. Wiener
Goldberg, Godles, Wiener & Wright LLP
1025 Connecticut Avenue, Suite 1000
Washington, DC 20036
(202) 429-4900

[10] *See* Telesat's Response to OneWeb at 5-15.
[11] OneWeb Grant, ¶ 25.d

CERTIFICATE OF SERVICE

I hereby certify that on this 3rd day of August, 2017, a copy of the foregoing ex parte response to the Reply Comments of WorldVu Satellites Limited was sent by electronic mail to the following:

Mariah Shuman
Senior Director, Regulatory Affairs
WorldVu Satellites Limited
Mariah@oneweb.net

Brian D. Weimer
Douglas A. Svor
Ashley Yeager
Sheppard Mullin Richter & Hampton LLP
bweimer@sheppardmullin.com

/s/
Michael Lehmkuhl