HENRY GOLDBERG
JOSEPH A. GODLES
JONATHAN L. WIENER
DEVENDRA ("DAVE") KUMAR
—————
HENRIETTA WRIGHT
THOMAS G. GHERARDI, P.C.
COUNSEL
—————
THOMAS S. TYCZ*
SENIOR POLICY ADVISOR

*NOT AN ATTORNEY

(202) 429-4900
TELECOPIER:
(202) 429-4912
e-mail:
general@g2w2.com
website: www.g2w2.com

September 14, 2017

FILED ELECTRONICALLY VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Telephone Meeting IB Docket No. 16-408

Dear Ms. Dortch,

This is to inform you that, on September 14, 2017, Elisabeth Neasmith and Mario Neri ("Telesat"), as well as Jonathan L. Wiener of this firm and the undersigned, had a telephone conversation with Jose Albuquerque, Division Chief, Karl Kensinger, Deputy Division Chief of the Commission's International Bureau, during which the points raised in the attached letter to Mr. Albuquerque were discussed.

Please direct any questions regarding this matter to the undersigned.

Respectfully submitted,

Henry Goldberg
Attorney for Telesat Canada

cc: Jose Albuquerque
     Karl Kensinger

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_____

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e-mail:
general@g2w2.com
website: www.g2w2.com

September 13, 2017

FILED ELECTRONICALLY VIA ECFS
Mr. Jose P. Albuquerque
Chief, Satellite Division
International Bureau
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: <u>IB Docket No. 16-408</u>

Dear Mr. Albuquerque,

A major issue in this proceeding has been whether a fixed separation angle can be used to determine when there will be interference among NGSO FSS systems, as originally contemplated in the Commission's proposed rules. Telesat appreciates the Bureau's acceptance of Telesat's analysis, as reflected in the draft *Report and Order*, that no such separation angle can be established.[1]

Unfortunately, the $\Delta T/T$ standard that the Bureau now has recommended in place of the fixed avoidance angle is equally unworkable. As demonstrated in the attached analysis, it is not possible to use $\Delta T/T$ as an in-line event trigger mechanism because operators cannot exchange information on many of the data items that are necessary to make a $\Delta T/T$ calculation in advance of an in-line event or in real time.

While the draft *Report and Order* acknowledges that implementing the proposed rule would involve a "complex calculation," it is much more than complex: The

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[1] *See Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Draft Report and Order and Further Notice of Proposed Rulemaking, IB- Docket No. 16-408, FCC-CIRC1709-04, at ¶ 47 (rel. Sept 7, 2017) ("draft *Report and Order*").

calculation is *impossible* to use to avoid in-line interference because the information necessary to perform it would not be known to an NGSO FSS system operator in time to implement it.

As Telesat has demonstrated throughout this proceeding, the only workable solution is through ITU coordination. Contrary to the Bureau's assumptions, that process does not make a "single 'winner'" out of any one party.[2] As the Commission has recognized in its grant of OneWeb's petition, ITU coordination rules "require[]both parties in coordination to "make every possible mutual effort to overcome [coordination] difficulties, in a manner acceptable to the parties concerned."[3] The Commission too can emphasize in its rules and license conditions the duty of parties to negotiate in good faith in such coordinations and then strictly enforce that duty as the parties coordinate.

Please direct any questions regarding this matter to the undersigned.[4]

Respectfully submitted,

Henry Goldberg
Attorney for Telesat Canada

Attachment

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[2] *Id.* at ¶ 50.

[3] *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, Call sign S2963*, Order and Declaratory Ruling, FCC 17-77 at note 33 (June 2017).

[4] This letter is being filed electronically through the Electronic Comment Filing System for inclusion in the public record in IB Docket No. 16-408 pursuant to the Commission's *ex parte* rules.

GOLDBERG, GODLES, WIENER & WRIGHT

White Paper on Delta T / T (ΔT/T)

ΔT/T is a calculation that shows the increase in (undesirable) noise of a Wanted system due to the transmissions of an Interfering system. ΔT/T can be calculated in the uplink direction, i.e. at the satellite, or in the downlink direction, i.e. at the earth station. Figure 1 illustrates a ΔT/T calculation in the downlink direction. The Wanted Earth Station is intending to receive a signal from its Wanted Satellite but is also receiving transmissions spilling from an Interfering Satellite intending to communicate with its own earth station.
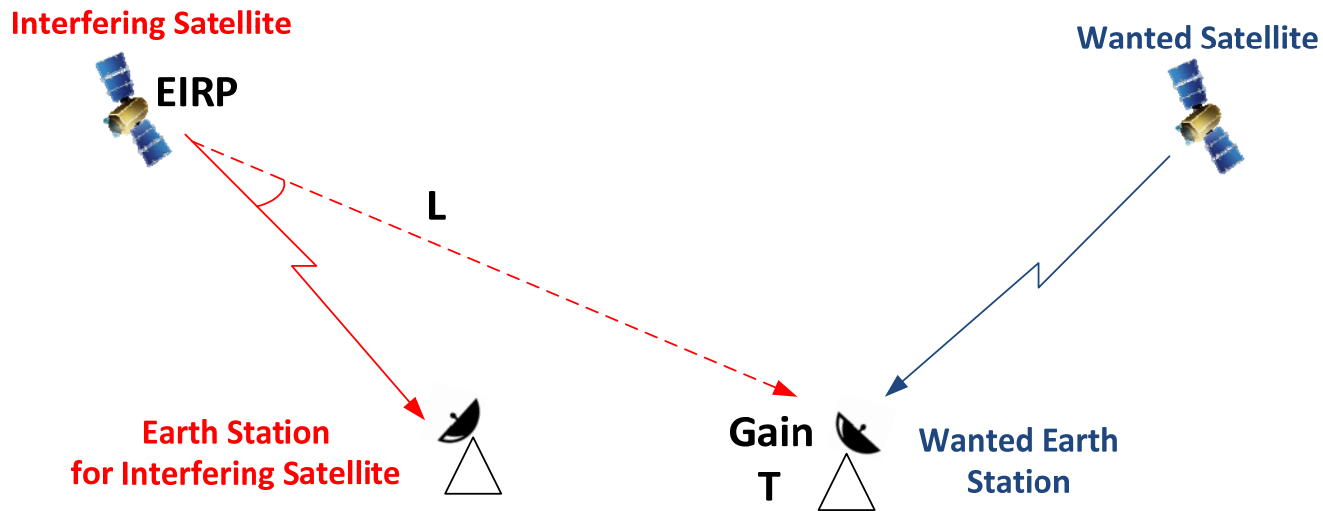

Figure 1: Illustration of ΔT/T calculation in the downlink direction, i.e. interference at the Wanted Earth Station

$$\frac{\Delta T}{T} = \frac{1}{k\,T}\left[\frac{EIRP_{interfering\ satellite} \cdot Gain_{wanted\ earth\ station}}{L}\right]$$
where: k = Boltzmann Constant

White Paper on Delta T / T (ΔT/T)

To calculate the ΔT/T at the Wanted Earth Station the information provided in Table 1 is required.

Table 1: Data items required for ΔT/T calculation, with indication of practicality of availability in advance/real time

			DATA ITEM REQUIRED	PRACTICAL TO EXCHANGE IN ADVANCE / REAL TIME?
1	T	Wanted Earth Station's Noise Temperature	a) Inherent Noise Temperature of the Wanted Earth Station as specified by manufacturer	No
2	EIRP	EIRP of the Interfering Satellite in the direction of the Wanted Earth Station	a) Interfering Satellite ephemeris	Yes
			b) Interfering Satellite power	No
			c) Interfering Satellite antenna pattern	Yes
			d) Interfering Satellite pointing	No
3	Gain	Gain of the Wanted Earth Station in the direction of the Interfering Satellite	a) Wanted Satellite ephemeris	Yes
			b) Wanted Earth Station antenna pattern	No
			c) Wanted Earth Station pointing	No
4	L	Distance between the Interfering Satellite and the Wanted Earth Station	a) Interfering Satellite ephemeris	Yes
			b) Location of the Wanted Earth Station	No

It is not possible to use ΔT/T as an in-line event trigger mechanism because it is not practical to exchange information on many of the data items listed in Table 1 in advance/real time.