



1776 K STREET NW
WASHINGTON, DC 20006
PHONE 202.719.7000
FAX 202.719.7049

7925 JONES BRANCH DRIVE
McLEAN, VA 22102
PHONE 703.905.2800
FAX 703.905.2820

www.wileyrein.com

January 18, 2011

Jennifer D. Hindin
202.719.4975
jhindin@wileyrein.com

VIA IBFS

Robert G. Nelson
Chief, Satellite Division
International Bureau
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Intelsat License LLC (f/k/a Intelsat North America LLC) Application to Modify Authorization for Intelsat 706, IBFS File No. SAT-MOD-20100511-00098 (Call Sign S2401)

Dear Mr. Nelson:

Intelsat License LLC (“Intelsat”) (f/k/a Intelsat North America LLC), by counsel, herein responds to the International Bureau’s (“Bureau”) December 17, 2010 request for additional information relating to Intelsat’s above-referenced application for authority to modify the authorization for the Intelsat 706 satellite.

In the attached Engineering Statement, Intelsat provides an interference analysis of the effect of Intelsat 706 (call sign S2401) transmissions from the 72.1° E.L. orbital location on adjacent satellites. As set forth in Sections 25.114(d)(7) and 25.140(b)(2) of the Commission’s rules, this analysis demonstrates the compatibility of Intelsat 706 two degrees from any authorized space station.¹

¹ 47 C.F.R. §§ 25.114(d)(7) and 25.140(b)(2). See also *International Bureau Satellite Division Information: Clarification of 47 C.F.R. § 25.140(b)(2), Space Station Application Interference Analysis*, Report No. SPB-195, DA 03-3863 (Dec. 3, 2003) (Public Notice); *International Bureau Satellite Division Information: Clarification of 47 C.F.R. § 25.140(b)(2), Space Station Application Interference Analysis*, Report No. SPB-207, DA 04-1708 (June 16, 2004) (Public Notice).



Marlene H. Dortch
January 18, 2011
Page 2

Please contact Susan Crandall of Intelsat at (202) 944-7848 or me with any questions.

Respectfully Submitted,

/s/ Jennifer D. Hindin

Jennifer D. Hindin
Counsel for Intelsat License LLC

Engineering Statement

Intelsat License LLC (“Intelsat”) (f/k/a Intelsat North America LLC) hereby supplements its pending application SAT-MOD-20100511-00098 pertaining to the proposed operation of Intelsat 706 from 72.1° E.L. Specifically, Intelsat proposes to replace the text in the section titled “Adjacent Satellite Link Analysis” of the Engineering Statement contained in its pending application with that provided herein and to include two new exhibits, 6 and 7. The inclusion of this supplementary information was requested by the Commission in a letter to Intelsat dated December 17, 2010.

The new text for the section “Adjacent Satellite Link Analysis” and Exhibits 6 and 7 are provided below:

Adjacent Satellite Link Analysis

The impact of the proposed Intelsat 706 emissions on the transmissions of a hypothetical adjacent satellite located at 70.1° E.L and 74.1° E.L was analyzed. It was assumed that each of these satellites had the same operating characteristics as the proposed Intelsat 706 spacecraft. In order to minimize the number of calculations to be performed, the following combined beam peak performance characteristics were assumed for the satellites at 70.1° E.L and 74.1° E.L:

Beam Name	Beam Polarization	Beam Peak G/T (dB/K)	Beam Peak SFD Range (dBW/m²)	Beam Peak EIRP (dBW)
Global	Circular	-7.5	-90.4 to -76.4	33.5
Hemi	Circular	-3.5	-91.4 to -77.4	38.3
Zone	Circular	-4.0	-89.9 to -75.9	38.8
C-Spot	Circular	2.5	-92.7 to -78.7	40.6
Ku-Spot	Linear	4.5	-93.8 to -79.8	54.1

For the satellite located at 70.1° E.L, it was assumed that the adjacent satellites were Intelsat 706, located at 72.1° E.L, and a hypothetical satellite located at 68.65° E.L having the combined coverage beams of IS-10 (currently located at 68.5° E.L) and IS-7 (currently located at 68.65° E.L). For the satellite located at 74.1° E.L, it was assumed that the adjacent satellites were Intelsat 706, located at 72.1° E.L, and a hypothetical satellite

having the same operating characteristics as Intelsat 706 located at 76.1° E.L.

For the C-band analysis, it was assumed that Intelsat 706 and the hypothetical satellites located at 68.65° E.L and 76.1° E.L operated with a maximum uplink power density of -38.7 dBW/Hz. It was further assumed that at C-band the satellite located at 68.65° E.L. operated with a maximum downlink beam peak EIRP density of -34.1 dBW/Hz while Intelsat 706 and the hypothetical satellite at 76.1° E.L operated with a maximum downlink EIRP density of -34.2 dBW/Hz.

For the Ku-band analysis, it was assumed that Intelsat 706 and the hypothetical satellites located at 68.65° E.L and 76.1° E.L operated with a maximum uplink power density of -45 dBW/Hz. It was further assumed that at Ku-band the satellite located at 68.65° E.L operated with a maximum downlink beam peak EIRP density of -18.3 dBW/Hz while Intelsat 706 and the hypothetical satellite at 76.1° E.L operated with a maximum downlink density of -20.4 dBW/Hz.

For both C-band and Ku-band, downlink EIRP densities were computed by dividing the peak EIRP by the minimum occupied bandwidth for a full transponder utilization.

The analysis considered the impact of Intelsat 706's digital carriers on a wide band digital carrier of the adjacent satellites located at 70.1° E.L and 74.1° E.L. Wide band carriers typically determine the minimum receiving earth station size and lead to the highest downlink EIRP density for a spacecraft. The impact of Intelsat 706 TV/FM carriers on the transmission of the adjacent satellites at 70.1° E.L and 74.1° E.L was not considered for the reasons articulated in the section above (titled "Link Budgets and Interference Analysis"). The assumptions made in the above section pertaining to Earth station off-axis gain performance, Earth station cross-polarization performance and rain attenuation were also applied in the analysis.

The results of the analysis are listed in Exhibits 6 and 7 and show that the proposed operation of Intelsat 706 would not have a significant impact on the operation of a satellite located at either 70.1° E.L and 74.1° W.L. Accordingly, Intelsat 706 transmissions will be limited to those levels contained in Sections 25.212(c) and (d) of the rules, as applicable, unless

higher levels are coordinated with affected adjacent satellite operators. In any case, pursuant to the results in Exhibits 6 and 7, at C-band, the uplink power density level of Intelsat 706's digital carriers will not exceed -38.7 dBW/Hz and the downlink EIRP density of such carriers will not exceed -34.2 dBW/Hz. Similarly, at Ku-band, the uplink power density level of Intelsat 706's digital carriers will not exceed -45 dBW/Hz and the downlink EIRP density of such carriers will not exceed -20.4 dBW/Hz.

Exhibit 6: Link Budget For Adjacent Satellite Located At 74.1° E.L.

UPLINK BEAM INFORMATION						
Uplink Beam Name	GLOBAL	HEMI	ZONE	CSPOT	KSPOT	ZONE
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	14.250	6.175
Uplink Beam Polarization	CIRCULAR	CIRCULAR	CIRCULAR	CIRCULAR	LINEAR	CIRCULAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-11.5	-7.5	-8.0	-1.5	.5	-8.0
Uplink SFD (dBW/m2)	-86.4	-87.4	-85.9	-88.7	-81.8	-85.9
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	GLOBAL	HEMI	ZONE	CSPOT	KSPOT	KSPOT
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	11.950	11.950
Downlink Beam Polarization	CIRCULAR	CIRCULAR	CIRCULAR	CIRCULAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	29.5	34.3	34.8	36.6	50.1	50.1
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	72.1E	72.1E	72.1E	72.1E	72.1E	72.1E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-45.0	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-34.7	-34.2	-34.2	-34.7	-25.6	-20.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	76.1E	76.1E	76.1E	76.1E	76.1E	76.1E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-45.0	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-34.7	-34.2	-34.2	-34.7	-25.6	-20.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION						
Carrier ID	41M0G7W	36M0G7W	36M0G6W	41M0G7W	112MG7W	34M0G7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	27981	24575	24575	27981	76436	23204
Code Rate	1/2x188/204	1/2x188/204	1/2x188/204	1/2x188/204	1/2x188/204	1/2x188/204
Occupied Bandwidth(kHz)	34310	30133	30133	34310	93724	28452
Allocated Bandwidth(kHz)	41000	36000	36000	41000	112000	34000
Minimum C/N, Clear Sky (dB)	3.36	3.36	3.36	3.36	3.36	3.36
Minimum C/N, Rain (dB)	3.36	3.36	3.36	3.36	3.36	3.36
UPLINK EARTH STATION						
Earth Station Diameter (meters)	8.1	7.0	7.0	7.0	7.0	8.1
Earth Station Gain (dBi)	52.8	51.0	51.0	51.0	58.1	52.8
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	4.5	3.5	3.5	3.0	1.2	1.2
Earth Station Gain (dBi)	43.9	41.1	41.1	39.7	41.3	41.3
Earth Station G/T (dB/K)	23.6	21.0	21.0	19.2	18.8	18.8
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	76.5	75.5	77.0	74.2	81.1	77.0
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-207.5	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-11.5	-7.5	-8.0	-1.5	.5	-8.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.4	-74.8	-74.8	-75.4	-79.7	-74.5
Uplink C/N(dB)	18.0	21.6	22.6	25.7	23.0	22.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	29.5	34.3	34.8	36.6	50.1	50.1
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	23.6	21.0	21.0	19.2	18.8	18.8
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.4	-74.8	-74.8	-75.4	-79.7	-74.5
Downlink C / N(dB)	9.5	12.3	12.8	12.2	11.3	16.5
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	18.0	21.6	22.6	25.7	23.0	22.8
C/N Downlink (dB)	9.5	12.3	12.8	12.2	11.3	16.5
C/I Intermodulation (dB)	N/A	N/A	N/A	N/A	N/A	N/A
C/I Uplink Co-Channel (dB)*	27.0	27.0	27.0	27.0	27.0	27.0
C/I Downlink Co-Channel (dB)*	27.0	27.0	27.0	27.0	27.0	27.0
C/I Uplink Adjacent Satellite 1 (dB)	17.8	17.4	18.9	15.5	24.4	19.2
C/I Downlink Adjacent Satellite 1 (dB)	9.9	10.0	10.5	7.1	13.8	13.8
C/I Uplink Adjacent Satellite 2 (dB)	17.8	17.4	18.9	15.5	24.4	19.2
C/I Downlink Adjacent Satellite 2 (dB)	12.4	14.8	15.3	15.9	17.2	17.2
C/(N+I) Composite (dB)	4.9	6.2	6.9	4.7	8.2	9.3
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	3.9	5.2	5.9	3.7	7.2	8.3
Minimum Required C/N (dB)	-3.4	-3.4	-3.4	-3.4	-3.4	-3.4
Excess Link Margin (dB)	.6	1.9	2.5	.3	3.9	5.0
Number of Carriers	1.0	1.0	1.0	1.0	1.0	1.0
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-51.7	-50.3	-48.8	-52.2	-56.7	-50.3
Downlink EIRP Density At Beam Peak (dBW/Hz)	-41.9	-36.5	-36.0	-34.8	-25.6	-20.4

Exhibit 7: Link Budget For Adjacent Satellite Located At 70.1° E.L.

UPLINK BEAM INFORMATION						
Uplink Beam Name	GLOBAL	HEMI	ZONE	CSPOT	KSPOT	ZONE
Uplink Frequency (GHz)	6.175	6.175	6.175	6.175	14.250	6.175
Uplink Beam Polarization	CIRCULAR	CIRCULAR	CIRCULAR	CIRCULAR	LINEAR	CIRCULAR
Uplink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Uplink Contour G/T (dB/K)	-11.5	-7.5	-8.0	-1.5	.5	-8.0
Uplink SFD (dBW/m2)	-86.4	-87.4	-85.9	-88.7	-81.8	-85.9
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
DOWNLINK BEAM INFORMATION						
Downlink Beam Name	GLOBAL	HEMI	HEMI	CSPOT	KSPOT	KSPOT
Downlink Frequency (GHz)	3.950	3.950	3.950	3.950	11.950	11.950
Downlink Beam Polarization	CIRCULAR	CIRCULAR	CIRCULAR	CIRCULAR	LINEAR	LINEAR
Downlink Relative Contour Level (dB)	-4.0	-4.0	-4.0	-4.0	-4.0	-4.0
Downlink Contour EIRP (dBW)	29.5	34.3	34.8	36.6	50.1	50.1
Rain Rate (mm/hr)	42.0	42.0	42.0	42.0	42.0	42.0
ADJACENT SATELLITE 1						
Satellite 1 Orbital Location	IS706	IS706	IS706	IS706	IS706	IS706
Satellite 1 Orbital Location	72.1E	72.1E	72.1E	72.1E	72.1E	72.1E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-45.0	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-34.7	-34.2	-34.2	-34.7	-25.6	-20.4
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
ADJACENT SATELLITE 2						
Satellite 1 Orbital Location	SAT-2	SAT-2	SAT-2	SAT-2	SAT-2	SAT-2
Satellite 1 Orbital Location	68.65E	68.65E	68.65E	68.65E	68.65E	68.65E
Uplink Power Density (dBW/Hz)	-38.7	-38.7	-38.7	-38.7	-45.0	-38.7
Uplink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
Downlink EIRP Density (dBW/Hz)	-34.1	-34.1	-34.1	-34.1	-18.3	-18.3
Downlink Polarization Advantage (dB)	0.0	0.0	0.0	0.0	0.0	0.0
CARRIER INFORMATION						
Carrier ID	41MG7W	36M0G7W	36M0G7W	41M0G7W	112MG7W	34M0G7W
Carrier Modulation	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Peak to Peak Bandwidth of EDS (MHz)	N/A	N/A	N/A	N/A	N/A	N/A
Information Rate(kbps)	27981	24575	24575	27981	76436	23204
Code Rate	1/2x188/204	1/2x188/204	1/2x188/204	1/2x188/204	1/2x188/204	1/2x188/204
Occupied Bandwidth(kHz)	34310	30133	30133	34310	93724	28452
Allocated Bandwidth(kHz)	41000	36000	36000	41000	112000	34000
Minimum C/N, Clear Sky (dB)	3.36	3.36	3.36	3.36	3.36	3.36
Minimum C/N, Rain (dB)	3.36	3.36	3.36	3.36	3.36	3.36
UPLINK EARTH STATION						
Earth Station Diameter (meters)	8.1	7.0	8.1	7.0	7.0	8.1
Earth Station Gain (dBi)	52.8	51.0	52.8	51.0	58.1	52.8
Earth Station Elevation Angle	20	20	20	20	20	20
DOWNLINK EARTH STATION						
Earth Station Diameter (meters)	6.1	3.5	3.5	3.5	1.8	1.2
Earth Station Gain (dBi)	46.5	41.1	41.1	41.1	44.8	41.3
Earth Station G/T (dB/K)	26.2	21.0	21.0	21.0	22.3	18.8
Earth Station Elevation Angle	20	20	20	20	20	20
LINK FADE TYPE						
	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky	Clear Sky
UPLINK PERFORMANCE						
Uplink Earth Station EIRP (dBW)	76.5	75.5	77.0	74.2	81.1	77.0
Uplink Path Loss, Clear Sky (dB)	-200.2	-200.2	-200.2	-200.2	-207.5	-200.2
Uplink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Satellite G/T(dB/K)	-11.5	-7.5	-8.0	-1.5	.5	-8.0
Boltzman Constant(dBW/K-Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.4	-74.8	-74.8	-75.4	-79.7	-74.5
Uplink C/N(dB)	18.0	21.6	22.6	25.7	23.0	22.8
DOWNLINK PERFORMANCE						
Downlink EIRP per Carrier (dBW)	29.5	34.3	34.8	36.6	50.1	50.1
Antenna Pointing Error (dB)	-5	-5	-5	-5	-5	-5
Downlink Path Loss, Clear Sky (dB)	-196.3	-196.3	-196.3	-196.3	-205.9	-205.9
Downlink Rain Attenuation	0.0	0.0	0.0	0.0	0.0	0.0
Earth Station G/T (dB/K)	26.2	21.0	21.0	21.0	22.3	18.8
Boltzman Constant(dBW / K - Hz)	228.6	228.6	228.6	228.6	228.6	228.6
Carrier Noise Bandwidth (dB-Hz)	-75.4	-74.8	-74.8	-75.4	-79.7	-74.5
Downlink C / N(dB)	12.1	12.3	12.8	14.0	14.8	16.5
COMPOSITE LINK PERFORMANCE						
C/N Uplink (dB)	18.0	21.6	22.6	25.7	23.0	22.8
C/N Downlink (dB)	12.1	12.3	12.8	14.0	14.8	16.5
C/I Intermodulation (dB)	N/A	N/A	N/A	N/A	N/A	N/A
C/I Uplink Co-Channel (dB)*	27.0	27.0	27.0	27.0	27.0	27.0
C/I Downlink Co-Channel (dB)*	27.0	27.0	27.0	27.0	27.0	27.0
C/I Uplink Adjacent Satellite 1 (dB)	17.8	17.4	18.9	15.5	24.4	19.2
C/I Downlink Adjacent Satellite 1 (dB)	12.9	10.0	10.5	12.3	18.2	13.8
C/I Uplink Adjacent Satellite 2 (dB)	14.1	13.7	15.2	11.8	20.7	15.5
C/I Downlink Adjacent Satellite 2 (dB)	10.7	10.1	10.6	11.9	9.6	11.5
C/(N+I) Composite (dB)	5.7	4.9	5.5	5.8	7.5	7.3
Required System Margin (dB)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Net C/(N+I) Composite (dB)	4.7	3.9	4.5	4.8	6.5	6.3
Minimum Required C/N (dB)	-3.4	-3.4	-3.4	-3.4	-3.4	-3.4
Excess Link Margin (dB)	1.3	.5	1.2	1.4	3.1	3.0
Number of Carriers	1.0	1.0	1.0	1.0	1.0	1.0
CARRIER DENSITY LEVELS						
Uplink Power Density (dBW/Hz)	-51.7	-50.3	-50.6	-52.2	-56.7	-50.3
Downlink EIRP Density At Beam Peak (dBW/Hz)	-41.9	-36.5	-36.0	-34.8	-25.6	-20.4

