

EXHIBIT A

**INTELSAT NORTH AMERICA LLC
SPECIAL TEMPORARY AUTHORITY REQUEST
EARTH STATION KA258
IOT SERVICES FOR INTELSAT 16 SATELLITE**

JANUARY 15, 2010

Analysis of Non-Ionizing Radiation for a 14.2-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 14.2-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326, Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	14.2	m
Antenna Surface Area	A _{surface}	$\pi D^2 / 4$	158.37	m ²
Subreflector Diameter	D _{sr}	Input	175.0	cm
Area of Subreflector	A _{sr}	$\pi D_{sr}^2 / 4$	24052.82	cm ²
Frequency	F	Input	14000	MHz
Wavelength	λ	300 / F	0.021429	m
Transmit Power	P	Input	270.0	W
Antenna Gain (dBi)	G _{es}	Input	64.7	dBi
Antenna Gain (factor)	G	10 ^{Ges/10}	2951209.2	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2 / (\pi^2 D^2)$	0.68	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

$$\begin{aligned} \text{Distance to the Far Field Region} \quad R_{ff} &= 0.60 D^2 / \lambda \\ &= 5645.9 \text{ m} \end{aligned} \quad (1)$$

The maximum main beam power density in the far field can be determined from the following equation:

$$\begin{aligned} \text{On-Axis Power Density in the Far Field} \quad S_{ff} &= G P / (4 \pi R_{ff}^2) \\ &= 1.989 \text{ W/m}^2 \\ &= 0.199 \text{ mW/cm}^2 \end{aligned} \quad (2)$$

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

$$\begin{aligned} \text{Extent of the Near Field} \quad R_{nf} &= D^2 / (4 \lambda) \\ &= 2352.5 \text{ m} \end{aligned} \quad (3)$$

The maximum power density in the Near Field can be determined from the following equation:

$$\begin{aligned} \text{Near Field Power Density} \quad S_{nf} &= 16.0 \eta P / (\pi D^2) \\ &= 4.644 \text{ W/m}^2 \\ &= 0.464 \text{ mW/cm}^2 \end{aligned} \quad (4)$$

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

$$\begin{aligned} \text{Transition Region Power Density} \quad S_t &= S_{nf} R_{nf} / R_t \\ &= 0.464 \text{ mW/cm}^2 \end{aligned} \quad (5)$$

4. Region between the Main Reflector and the Subreflector

Transmissions from the feed assembly are directed toward the subreflector surface, and are reflected back toward the main reflector. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the subreflector and the reflector surfaces can be calculated by determining the power density at the subreflector surface. This can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Subreflector} \quad S_{sr} &= 4000 P / A_{sr} & (6) \\ &= 44.901 \text{ mW/cm}^2 \end{aligned}$$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the subreflector. The area is now the area of the main reflector aperture and can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Main Reflector Surface} \quad S_{\text{surface}} &= 4 P / A_{\text{surface}} & (7) \\ &= 6.820 \text{ W/m}^2 \\ &= 0.682 \text{ mW/cm}^2 \end{aligned}$$

6. Region between the Main Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

$$\begin{aligned} \text{Power Density between Reflector and Ground} \quad S_g &= P / A_{\text{surface}} & (8) \\ &= 1.705 \text{ W/m}^2 \\ &= 0.170 \text{ mW/cm}^2 \end{aligned}$$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm ²)		Hazard Assessment
1. Far Field ($R_{ff} = 5645.9$ m)	S_{ff}	0.199	Satisfies FCC MPE
2. Near Field ($R_{nf} = 2352.5$ m)	S_{nf}	0.464	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	0.464	Satisfies FCC MPE
4. Between Main Reflector and Subreflector	S_{sr}	44.901	Potential Hazard
5. Main Reflector	$S_{surface}$	0.682	Satisfies FCC MPE
6. Between Main Reflector and Ground	S_g	0.170	Satisfies FCC MPE

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm ²)		Hazard Assessment
1. Far Field ($R_{ff} = 5645.9$ m)	S_{ff}	0.199	Satisfies FCC MPE
2. Near Field ($R_{nf} = 2352.5$ m)	S_{nf}	0.464	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	0.464	Satisfies FCC MPE
4. Between Main Reflector and Subreflector	S_{sr}	44.901	Potential Hazard
5. Main Reflector	$S_{surface}$	0.682	Satisfies FCC MPE
6. Between Main Reflector and Ground	S_g	0.170	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based on the above analysis it is concluded that harmful levels of radiation will not exist in regions normally occupied by the public or the earth station's operating personnel. The transmitter will be turned off during antenna maintenance so that the FCC MPE of 5.0 mW/cm² will be complied with for those regions with close proximity to the reflector that exceed acceptable levels.

EXHIBIT B

**INTELSAT NORTH AMERICA LLC
SPECIAL TEMPORARY AUTHORITY REQUEST
EARTH STATION KA258
IOT SERVICES FOR INTELSAT 16 SATELLITE**

JANUARY 15, 2010

Exhibit B

Compliance with FCC Report & Order (96-377) in respect to the operations in the 13.75 - 14.0 GHz Band

1. Background

This exhibit is presented to demonstrate the extent to which the Intelsat North America LLC satellite earth station in Clarksburg, MD is in compliance with FCC Report & Order 96-377. The potential interference from the earth station to U.S. Navy shipboard radiolocation operations (RADAR) and the NASA space research activities in the 13.75 - 14.0 GHz Band is addressed in this exhibit. The parameters for the earth station are provided in Table 1 below.

Table 1. Earth Station Characteristics

- Coordinates (NAD83): 39° 13' 06.6" N, 77° 16' 15.3" W
- Satellite Location for Earth Station: Intelsat IS-16 at 48.0° W
- Frequency Band: 13.75-14.5 GHz for uplink
- Polarizations: Circular / Linear Switchable
- Emissions: 850KN0N
- Modulation: No Modulation
- Maximum Aggregate Uplink EIRP: 88.0 dBW for all Carriers
- Transmit Antenna Characteristics
 - Antenna Size: 14.2 meter in Diameter
 - Antenna Type/Model: TIW
 - Gain: 64.7 dBi
- RF power into Antenna Flange: 23.3 dBW
or 0.0 dBW/4 kHz (Maximum)
- Minimum Elevation Angle:
Clarksburg, Md. 35.4° @ 138.4° Az (Intelsat IS-16)
- Side Lobe Antenna Gain: 32 - 25*log(θ)

Because the above uplink spectrum is shared with the Federal Government, coordination in this band requires resolution data pertaining to potential interference between the earth stations and both Navy Department and NASA systems. Potential interference from the earth station could

impact the Navy and/or NASA systems in two areas. These areas are noted in FCC Order 96-377 and consist of (1) Radiolocation and radio navigation, (2) Data Relay Satellites.

Summary of Coordination Issues:

- 1) Potential Impact to Government Radiolocation (Shipboard Radar)
- 2) Potential Impact to NASA Data Relay Satellite Systems (TDRSS)

2. Potential Impact to Government Radiolocation (Shipboard Radar)

Radiolocation operations (RADAR) may occur anywhere in the 13.4 - 14 GHz frequency band aboard ocean going United States Navy ships. The FCC's Order 96-377 allocates the top 250 MHz of this 600 MHz band to the Fixed Satellite Service (FSS) on a co-primary basis with the radiolocation operations and provides for an interference protection level of $-167 \text{ dBW/m}^2/4 \text{ kHz}$.

The closest distance to the shoreline from the Clarksburg, MD earth station is approximately 88 km Southeast towards the Atlantic Ocean. The calculation of the power spectral density at this distance is provided below:

- | | |
|-----------------------------|-----------------------|
| 1. Clear Sky EIRP: | 88.00 dBW |
| 2. Carrier Bandwidth: | 850 kHz |
| 3. PD at antenna input: | 0.0 dBW/4 kHz |
| 4. Transmit Antenna Gain: | 64.7 dBi |
| 5. Antenna Gain Horizon: | FCC Reference Pattern |
| 6. Antenna Elevation Angle: | 35.4° |

The proposed earth station will radiate interference toward the ocean according to its off-axis side-lobe performance. A conservative analysis, using FCC standard reference pattern, results in off-axis antenna gains of -6.6 dBi towards the Atlantic Ocean.

The signal density at the shoreline, through free space is:

$$\begin{aligned} \text{PFD} &= \text{Antenna Feed Power density (dBW/4 kHz)} + \text{Antenna Off-Axis Gain (dBi)} - \text{Spread Loss (dBw-m}^2\text{)} \\ &= 0.0 \text{ dBw/4 kHz} + (-6.6 \text{ dBi}) - 10 * \log[4\pi * (88000\text{m})^2] \\ &= -116.5 \text{ dBW/m}^2/4 \text{ kHz} + \text{Additional Path Losses (~68.0 dB)} \end{aligned}$$

Our calculations show additional path loss of approximately 68.0 dB including absorption loss and earth diffraction loss for the actual path profiles from the proposed earth station to the nearest shoreline.

The calculated PFD including additional path losses to the closest shoreline location is $-184.5 \text{ dBW/m}^2/4 \text{ kHz}$. This is 17.5 dB below the $-167 \text{ dBW/m}^2/4 \text{ kHz}$ interference criteria of FCC Order 96-377. Therefore, there should be no interference to the U.S. Navy RADAR from the

Clarksburg, MD earth station due to the distance and the terrain blocking between the site and the shore.

3. Potential Impact to NASA's Data Relay Satellite System (TDRSS)

The geographic location of the Intelsat North America LLC earth station in Clarksburg, MD is outside the 390 km radius coordination contour surrounding NASA's White Sands, NM ground station complex. Therefore, the TDRSS space-to-earth link will not be impacted by the earth station in Clarksburg, MD.

The TDRSS space-to-space link in the 13.772 to 13.778 GHz band is assumed to be protected if an earth station produces an EIRP less than 71 dBW/6 MHz in this band. The 14.2 meter earth station dish will have an EIRP greater than 71 dBW/6 MHz in this band. The total EIRP for all carriers is 88.0 dBW, and the equivalent EIRP per 6 MHz segment remains at 88.0 dBW/6 MHz. Therefore, there will be interference to the TDRSS space-to-space link.

In order to meet the 71 dBW/6 MHz interference criteria, the earth station would have to be limited to an RF power density 17.0 dB lower than the maximum of 0.0 dBW/4kHz or -17.0 dBW/4kHz for an EIRP of 71.0 dBW.

4. Coordination Issue Result Summary and Conclusions

The results of the analysis and calculations performed in this exhibit indicate that compatible operation between the Clarksburg, MD earth station and the U.S. Navy and NASA systems space-to-earth link are possible. These analyses have been based on the assumption of 850 kHz bandwidth carriers. Operations in NASA systems space-to-space link (13772.0 to 13778.0 MHz) will occur at a lower EIRP value of 71 dBW. In order to meet the 71 dBW/6 MHz interference criteria, the earth station will be limited to a maximum total EIRP of 71.0 dBW for this band. Hence, there will be no interference into TDRSS space-to-space links.

No interference to U.S. Navy RADAR operations from the Clarksburg, MD earth station will occur.

EXHIBIT C

INTELSAT NORTH AMERICA LLC

SPECIAL TEMPORARY AUTHORITY REQUEST

EARTH STATION KA258

IOT SERVICES FOR INTELSAT 16 SATELLITE

JANUARY 15, 2010

FCC 312

Schedule B

**FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS
Technical and Operational Description**

(Place an "X" in one of the blocks below)

License of New Station Registration of new Domestic Receive-Only Station Amendment to a Pending Application Modification of License/Registration Notification of Minor Modification.

B1. Location of Earth Station Site. If temporary-fixed, mobile, or VSAT remote facility, specify area of operation and point of contact. If VSAT hub station, give its location. For VSAT networks attach individual Schedule B, Page 1 sheets for each hub station and each remote station. Individually provide the Location, Points of Communications, and Destination Points for each hub and remote station.

B1a. Station Call Sign KA258	B1b. Site identifier (HUB, REMOTEI, etc.)	B1c. Telephone Number (240) 527 - 6295	B1j. Geographic Coordinates N/S, Deg. - Min. - Sec. - E/W Lat. 39° 13' 06.6" N Lon. 77° 16' 15.3" W	B1k. Lat./Lon. Coordinates are: <input type="checkbox"/> NAD-27 <input checked="" type="checkbox"/> NAD-83
B1d. Mailing Street Address of Station or Area of Operation 22021 COMSAT Drive		B1e. Name of Contact Person Robert Phillips	B1i. Site Elevation (AMSL) 145.4 meters	
B1f. City Clarksburg	B1g. County Montgomery	B1h. State MD	B1i. Zip Code 20871	

B2. Points of Communications: List the names and orbit locations of all satellites with which this earth station will communicate. The entry "ALSAAT" is sufficient to identify the names and locations of all satellite facilities licensed by the U.S. All non-U.S. licensed satellites must be listed individually.

Satellite Name and Orbit Location	Satellite Name and Orbit Location
Intelsat-16 (48.0° West Longitude)	

B3. Destination points for communications using non-U.S. licensed satellites. For each non-U.S. licensed satellite facility identified in section B2 above, specify the destination point(s) (countries) where the services will be provided by this earth station via each non-U.S. license satellite system. Use additional sheets as needed.

Satellite Name	List of Destination Points

FEDERAL COMMUNICATIONS COMMISSION
 APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS
 FCC Form 312 - Schedule B: (Technical and Operational Description)

B4. Earth Station Antenna Facilities: Use additional pages as needed.

(a) Site ID*	(b) Antenna ID**	(c) Quantity	(d) Manufacturer	(e) Model	(f) Antenna Size (meters)	(g) Antenna Gain Transmit and/or Receive (dBi at GHz)	
						64.7 dBi at 14.00 GHz	63.2 dBi at 11.45 GHz
Clarksburg	CKT-02T	1	TIW	14.2M	14.2		

B5. Antenna Heights and Maximum Power Limits: (The corresponding Antenna ID in tables B4 and B5 applies to the same antenna)

(a) Antenna ID**	(b) Antenna Structure Registration No.	Maximum Antenna Height		(e) Building Height Above Ground Level (meters)***	(f) Maximum Antenna Height Above Rooftop (meters)***	(g) Total Input Power at antenna flange (Watts)	(h) Total EIRP for all carriers (dBW)
		(c) Above Ground Level (meters)	(d) Above Mean Sea Level (meters)				
CKT-02T		15.0	160.4			270.0	89.0

Notes: * If this is an application for a VSAT network, identify the site (Item B1b, Schedule B, Page 1) where each antenna is located. Also include this Site-ID on Schedule B, Page 5.
 ** Identify each antenna in VSAT network or multi-antenna station with a unique identifier, such as HUB, REMOTE1, A1, A2, 10M, 12M, 7M, etc. Use this same antenna ID throughout tables B4, B5, B6, and B7 when referring to the same antenna.
 *** Attach sketch of site or exemption, See 47 CFR Part 17.

**FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS
FCC Form 312 - Schedule B: (Technical and Operational Description)**

If VSAT Network, provide the SITE-ID (Item B1b) of the station that B8-B13 are in response to (HUB, REMOTE1, etc.): _____

<p>B8. If the proposed antenna(s) operate in the Fixed Satellite Service (FSS) with geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurements? If NO, provide as an exhibit, a technical analysis showing compliance with two-degree spacing policy.</p>	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO												
<p>B9. If the proposed antenna(s) do not operate in the Fixed Satellite Service (FSS), or if they operate in the Fixed Satellite Service (FSS) with non-geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a2) and (b) as demonstrated by the manufacturer's qualification measurement?</p>	<input type="checkbox"/> YES	<input type="checkbox"/> NO <input type="checkbox"/> N/A												
<p>B10. Is the facility operated by remote control? If YES, provide the location and telephone number of the control point.</p>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO												
<p>Remote Control Point Location:</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:40%; padding: 2px;">B10a. Street Address</td> <td style="width:20%; padding: 2px;">B10c. County</td> <td style="width:20%; padding: 2px;">B10.d. State/Country</td> <td style="width:20%; padding: 2px;">B10e. Zip Code</td> </tr> <tr> <td style="padding: 2px;">B10b. City</td> <td colspan="3" style="padding: 2px;">B10g. Call Sign of Control Station (if appropriate)</td> </tr> <tr> <td colspan="4" style="padding: 2px;">B10f. Telephone Number</td> </tr> </table>			B10a. Street Address	B10c. County	B10.d. State/Country	B10e. Zip Code	B10b. City	B10g. Call Sign of Control Station (if appropriate)			B10f. Telephone Number			
B10a. Street Address	B10c. County	B10.d. State/Country	B10e. Zip Code											
B10b. City	B10g. Call Sign of Control Station (if appropriate)													
B10f. Telephone Number														
<p>B11. Is frequency coordination required? If YES, attach a frequency coordination report as an exhibit.</p>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO												
<p>B12. Is coordination with another country required? If YES, attach the name of the country(ies) and plot of coordination contours as an exhibit.</p>	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO												
<p>B13. FAA Notification - (See 47 CFT Part 17 and 47 CFT Part 25.113(c)) Where FAA notification is required, have you attached a copy of a completed FCC Form 854 and/or the FAA's study regarding the potential hazard of the structure to aviation? FAILURE TO COMPLY WITH 47 CFT PARTS 17 AND 25 WILL RESULT IN THE RETURN OF THIS APPLICATION</p>			<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO										

EXHIBIT D

**INTELSAT NORTH AMERICA LLC
SPECIAL TEMPORARY AUTHORITY REQUEST
EARTH STATION KA258
IOT SERVICES FOR INTELSAT 16 SATELLITE**

JANUARY 15, 2010

Exhibit D

FCC Form 312, Response to Question 36: Cancelled Authorizations

Intelsat North America LLC ("Intelsat") has never had an FCC license "revoked."

However, on June 26, 2000, the International Bureau "cancelled" two Ka-band satellite authorizations issued to PanAmSat Licensee Corp. ("PanAmSat"), a sister company of Intelsat, based on the Bureau's finding that PanAmSat had not satisfied applicable construction milestones. *See* PanAmSat Licensee Corp., Memorandum Opinion and Order, DA 00-1266, 15 FCC Rcd 18720 (IB 2000). In that same order, the Bureau denied related applications to modify the cancelled authorizations. PanAmSat filed an application for review of the Bureau's decision, which the Commission denied, and subsequently filed an appeal with the United States Court of Appeals for the District of Columbia Circuit, which was dismissed in January 2003 at PanAmSat's request. Notwithstanding the fact that the Bureau's action does not seem to be the kind of revocation action contemplated by question 36, Intelsat is herein making note of the decision in the interest of absolute candor and out of an abundance of caution. In any event, the Bureau's action with respect to PanAmSat does not reflect on either PanAmSat's or Intelsat's basic qualifications, which are well-established and a matter of public record.