Exhibit A

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Intelsat License LLC
HAGERSTOWN, MD
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
December 20, 2016

TABLE OF CONTENTS

1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 11/16/2016.

Company
3G Wireless, LLC
ACC License, LLC
AERIAL VIDEO SYSTEMS
Alascom Inc
American Broadcasting Companies, Inc.
Antietam Cable Television
Ascent Media Network Services, LLC
Bellsouth Telecommunications, Inc.
Borgeson, Tom R.
Broadcast Sports Inc.
C-SPAN
CBS TELEVISION LICENSES LLC
CNN America, Inc.
CTVN HARRISBURG, LLC
Carolina Telephone and Telegraph Co
Casper, John
CenturyTel of the Southwest, Inc.
Chicago Comnet Corp
Cincinnati Bell Wireless LLC
Citywide News Network, Inc.
Cohen, Elena
Cowboys Stadium LP
DCI II, INC.
Direct Broadcast Services, Inc.
F Corporation
GEORGE MASON UNIVERSITY INSTR FNDTION
Global Telecom & Technology Americas, In
Goodyear Tire & Rubber Company
HF Enterprises, Inc
HOWARD UNIVERSITY TELEVISION - (WHUT-TV)
Hallco Unlimited, Inc.
Hawaiian Telcom, Inc.
Heiden, William
Illinois Bell Telephone Company
Indiana Bell Telephone Company
Information & Display Systems, Inc.
Information Super Station, LLC
International Communications Group, Inc.
Kentucky RSA #3 Cellular General Partner
Kentucky RSA #4 Cellular General Partner

MERCURY COMMUNICATIONS
Maryland Public Broadcasting Commission
Media General Communications Holdings, L
Michigan Bell Telephone Company
Moreen, Steven K
Multimedia Holdings Corporation
NBC Telemundo License LLC
NEW ENGLAND DIGITAL DISTRIBUTION, INC.
NEW ENGLAND SATELLITE SYSTEMS INC
NSM Surveillance
National Cable Satellite Corporation
Navajo Communications Company
NorthWest Suburbs Community Access Corp
OHIO BELL TELEPHONE COMPANY
Onboard Images
Pacific Bell Tel Com dba AT&T California
Pacific and Southern Company, Inc.
Penn Service Microwave Co., Inc.
Pennsylvania Educational Comm Systems
Plateau Telecommunications, Inc.
Plum TV, LLC
Production & Satellite Services, Inc.
QUICK LINK CONNECTIONS INC
Qwest Corporation
RCC Minnesota Inc. - MN NE ND SD
REMOTE FACILITIES CONSULTING SERVICES
RF Central, LLC
RF Film, Inc
Radiofone, Inc.
Randy Hermes Production
Remote Broadcasts, Inc.
SBE Coordinator
Southwestern Bell Telephone L.P.
Speedshotz, Inc
TTWN Networks, LLC
Unisat, Inc.
United Telephone - Southeast
VERIZON SOUTH INC.
Verizon California Inc.
Verizon Maryland, Inc.
Verizon New England Inc.
Verizon New Jersey, Inc.
Verizon New York, Inc.
Verizon North Inc.
Verizon Northwest Inc.
Verizon Pennsylvania, Inc.
Verizon Virginia, Inc.
Verizon Washington DC, Inc.
Village Video Productions Inc
Vyvx, LLC
WBAL HEARST-ARGYLE TV, INC. (CA CORP.)
WDCW, LLC
WGAL Hearst Television, Inc
WHP Licensee, LLC
WITF Inc.
WJAC Licensee, LLC

WUSA-TV, Inc
West Virginia Media Holdings, LLC
Westar Satellite Services LP
Western Technical Services
Wexler Video, Inc.
Winged Vision Inc
Wisconsin Bell Telephone Company
Wolfe Air Aviation

4. EARTH STATION COORDINATION DATA

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 http://www.comsearch.com

Date:	12/20/2016
Job Number:	161116COMSGE01

Administrative Information

Status	ENGINEER PROPOSAL
Call Sign	HAGERSTO
Licensee Code	INTELS
Licensee Name	Intelsat License LLC

Site Information — HAGERSTOWN, MD

Venue Name	
Latitude (NAD 83)	39° 35' 53.8" N
Longitude (NAD 83)	77° 45' 20.8" W
Climate Zone	A
Rain Zone	2
Ground Elevation (AMSL)	168.69 m / 553.4 ft

Link Information

Satellite Type	Geostationary
Mode	TR - Transmit-Receive
Modulation	Digital
Satellite Arc	6° W to 149° West Longitude
Azimuth Range	101.9° to 257.8°
Corresponding Elevation Angles	5.3° / 5.7°
Antenna Centerline (AGL)	5.49 m / 18.0 ft

Antenna Information		**Receive - FCC32**		**Transmit - FCC32**
Manufacturer		GD Satcom Technologies		GD Satcom Technologies
Model		13.1 KPK		13.1 KPK
Gain / Diameter		62.3 dBi / 13.1 m		63.6 dBi / 13.1 m
3-dB / 15-dB Beamwidth		0.10° / 0.26°		0.12° / 0.24°
Max Available RF Power	(dBW/4 kHz)			(1) -5.3 (2) 11.4
	(dBW/MHz)			18.7 35.4
Maximum EIRP	(dBW/4 kHz)			58.3 75.0
	(dBW/MHz)			82.3 99.0
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%

Frequency Information	**Receive 11.0 GHz**	**Transmit 13.0 GHz**
Emission / Frequency Range (MHz)	1M50G7W - 112MG7W / 11459.2 - 11720.0 1M50G7W – 112MG7W / 11832.2 – 11943.5	(1) 1M50G7W - 112MG7W / 12750.0 - 12781.0 1M50G7W - 112MG7W / 12844.0 - 12881.0 1M50G7W - 112MG7W / 12944.0 - 12981.0 1M50G7W - 112MG7W / 13006.0 - 13081.0 1M50G7W - 112MG7W / 13144.0 - 13181.0 (2) 1M50G7W - 112MG7W / 13249.5 (center)
Max Great Circle Coordination Distance	702.1 km / 436.2 mi	407.3 km / 253.1 mi
Precipitation Scatter Contour Radius	602.2 km / 374.1 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

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Coordination Values	**HAGERSTOWN, MD**			
Licensee Name	Intelsat License LLC			
Latitude (NAD 83)	39° 35' 53.8" N			
Longitude (NAD 83)	77° 45' 20.8" W			
Ground Elevation (AMSL)	168.69 m / 553.4 ft			
Antenna Centerline (AGL)	5.49 m / 18.0 ft			
Antenna Model	GD Satcom 13.1 meter			
Antenna Mode	Receive 11.0 GHz		Transmit 14.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-5.3 (dBW/4 kHz)		

			Receive 11.0 GHz		Transmit 13.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.27	101.82	-10.00	224.32	-10.00	160.61
5	0.23	96.84	-10.00	228.21	-10.00	166.46
10	0.21	91.86	-10.00	230.79	-10.00	169.29
15	0.20	86.88	-10.00	231.06	-10.00	169.58
20	0.22	81.90	-10.00	229.66	-10.00	168.05
25	0.20	76.92	-10.00	230.88	-10.00	169.38
30	0.00	71.95	-10.00	231.37	-10.00	169.91
35	0.00	66.97	-10.00	231.37	-10.00	169.91
40	0.23	61.99	-10.00	228.65	-10.00	166.94
45	0.00	57.03	-10.00	231.37	-10.00	169.91
50	0.00	52.06	-10.00	231.37	-10.00	169.91
55	0.00	47.10	-9.82	232.14	-9.82	170.58
60	0.00	42.14	-8.62	237.52	-8.62	175.16
65	0.00	37.19	-7.26	243.77	-7.26	180.32
70	0.00	32.26	-5.72	251.28	-5.72	186.19
75	0.00	27.35	-3.92	260.19	-3.92	193.00
80	0.00	22.47	-1.79	271.23	-1.79	200.23
85	0.00	17.66	0.83	285.47	0.83	210.42
90	0.00	12.98	4.17	301.96	4.17	224.12
95	0.00	8.67	8.55	332.90	8.55	242.56
100	0.00	5.62	13.26	702.05	13.26	407.30
105	0.00	6.15	12.27	472.11	12.27	331.37
110	0.00	9.60	7.45	324.46	7.45	238.34
115	0.00	13.27	3.93	300.47	3.93	223.11
120	0.00	16.89	1.31	288.17	1.31	212.35
125	0.00	20.41	-0.75	276.81	-0.75	204.23
130	0.00	23.83	-2.43	267.88	-2.43	198.69
135	0.00	27.11	-3.83	260.66	-3.83	193.36
140	0.00	30.23	-5.01	254.75	-5.01	188.87
145	0.00	33.14	-6.01	249.86	-6.01	185.08
150	0.00	35.82	-6.85	245.83	-6.85	181.87
155	0.00	38.20	-7.55	242.41	-7.55	179.21
160	0.00	40.26	-8.12	239.78	-8.12	177.05
165	0.00	41.93	-8.56	237.77	-8.56	175.37
170	0.00	43.16	-8.88	236.35	-8.88	174.18
175	0.00	43.92	-9.07	235.50	-9.07	173.46
180	0.00	44.18	-9.13	235.21	-9.13	173.22
185	0.00	43.92	-9.07	235.49	-9.07	173.46

COMSEARCH

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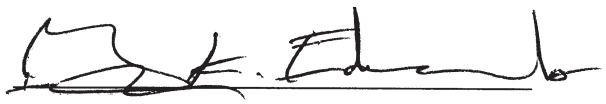
Coordination Values	**HAGERSTOWN, MD**			
Licensee Name	Intelsat License LLC			
Latitude (NAD 83)	39° 35' 53.8" N			
Longitude (NAD 83)	77° 45' 20.8" W			
Ground Elevation (AMSL)	168.69 m / 553.4 ft			
Antenna Centerline (AGL)	5.49 m / 18.0 ft			
Antenna Model	GD Satcom 13.1 meter			
Antenna Mode	Receive 11.0 GHz		Transmit 14.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power		-5.3 (dBW/4 kHz)		

			Receive 11.0 GHz		Transmit 13.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	43.16	-8.88	236.35	-8.88	174.18
195	0.00	41.93	-8.56	237.77	-8.56	175.37
200	0.00	40.26	-8.12	239.78	-8.12	177.05
205	0.00	38.20	-7.55	242.41	-7.55	179.21
210	0.00	35.81	-6.85	245.83	-6.85	181.88
215	0.24	32.95	-5.95	245.98	-5.95	181.13
220	0.29	30.01	-4.93	245.91	-4.93	180.08
225	0.45	26.78	-3.70	236.56	-3.70	169.38
230	0.36	23.57	-2.31	251.82	-2.31	183.43
235	0.23	20.25	-0.66	273.71	-0.66	201.39
240	0.20	16.75	1.40	288.53	1.40	212.58
245	0.22	13.13	4.04	299.27	4.04	222.01
250	0.35	9.36	7.72	308.05	7.72	225.57
255	0.29	6.07	12.41	483.06	12.41	338.96
260	0.33	5.80	12.92	672.93	12.92	407.30
265	0.39	8.94	8.21	306.51	8.21	223.86
270	0.35	13.31	3.89	286.81	3.89	208.80
275	0.35	18.00	0.62	268.09	0.62	196.08
280	0.36	22.81	-1.96	254.30	-1.96	185.51
285	0.26	27.71	-4.07	252.79	-4.07	186.06
290	0.00	32.66	-5.85	250.63	-5.85	185.68
295	0.00	37.59	-7.38	243.24	-7.38	179.88
300	0.00	42.53	-8.72	237.07	-8.72	174.79
305	0.22	47.46	-9.91	229.52	-9.91	167.82
310	0.31	52.41	-10.00	220.65	-10.00	156.50
315	0.00	57.40	-10.00	231.37	-10.00	169.91
320	0.00	62.36	-10.00	231.37	-10.00	169.91
325	0.00	67.33	-10.00	231.37	-10.00	169.91
330	0.00	72.31	-10.00	231.37	-10.00	169.91
335	0.36	77.27	-10.00	216.72	-10.00	152.14
340	0.28	82.25	-10.00	223.21	-10.00	159.36
345	0.27	87.23	-10.00	224.20	-10.00	160.48
350	0.21	92.20	-10.00	230.66	-10.00	169.15
355	0.35	97.18	-10.00	217.65	-10.00	153.17

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: _ 

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: December 20, 2016

Exhibit B

Intelsat License LLC
Hagerstown, Maryland

GD Satcom/13.1KPK 13.1 Meter Earth Station

1. Background

This Exhibit is presented to demonstrate the extent to which the Intelsat License LLC ("Intelsat") satellite earth station in Hagerstown, Maryland is in compliance with the Federal Communications Commision ("FCC") Report and Order 96-377. The potential inteference from the earth station to U.S. Navy shipboard radiolocation operations ("RADAR") and the National Aeronautics and Space Administration ("NASA") space research activities in the 13.75-14.0 GHz band is addressed in this exhibit. The parameters for the earth station are:

Coordinates (NAD83):	39° 35' 53.8" N, 77° 45' 20.8" W
Satellite Location for Earth Station:	IS-32e at 149˚W to 6˚W
Frequency Band:	13.75-14.00 GHz
Polarizations:	Linear
Emissions:	36M0G7W
Modulation:	FM/PCM/PSK
Maximum Aggregate Uplink EIRP:	85dBW for all Carriers
Transmit Antenna Characteristics	
Antenna Size:	13.1 Meters in Diameter
Anenna Type/Model:	GD Satcom/13.1KPK
Gain:	63.6 dBi
RF Power into Antenna Flange:	21.4 dBW or -18.1 dBW/4kHz
Minimum Elevation Angle:	5.7˚ @ 257.8˚ Azimuth
	5.3˚ @ 101.9˚ Azimuth
Side Lobe Antenna Gain	FCC Reference Pattern

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 U.S. Navy Department and NASA systems. Potential intefference from the earth station could impact the U.S. Navy and/or NASA systems in two areas. These areas are noted in GCC Report and Order 96-377 dated September 1996, and consist of (1) Radiolocation and Radio Navigation, (2) Data Relay Satellites.

Summary of Coordination Issues:

a.) Potential Impact to Government Radiolocation (Shipboard Radar)
b.) Potential Impact to NASA Tracking and Data Relay Satellite Systems ("TDRSS")

2. Potential Impact to Government Radiolocation (Shipboard Radar)

Radiolocation operations ("RADAR") may occur anywhere in the 13.4-14.0 GHz frequency band aboard ocean-going U.S. Navy ships. FCC order 96-377 allocates the top 250MHz 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 dBW/m^2/4kHz.

The closest distance to the shoreline from Hagerstown, Maryland earth station is approximately 131 km. The calculation of the power spectral density at this distance is given by:

1. Clear Sky EIRP: 85 dBW
2. Carrier Bandwidth: 36000 kHz
3. PD at antenna input: -18.1 dBW/4kHz
4. Transmit Antenna Gain: 63.6 dBi
5. Antenna Gain to Horizon: 10.1 dBi
6. Antenna Elevation Angles: 5.7˚ @ 257.8˚ azimuth
   5.3˚ @ 101.9˚ azimuth

The 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 an off-axis antenna gain of 10.1 towards the nearest shoreline.

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

PFD = Antenna Feed Power density (dBW/4kHz) + Antenna Off-Axis Gain (dBi) - Spread Loss (dBW/m^2)

= -18.1dBW/4kHz + 10.1dBi - (10*log[4*PI*[131km]^2))

= -121.4 dBW/m/4kHz - Additional Path Losses (69 dB)

Our calculation indicate additional path loss of approximately 69 dB including absorbtion loss and earth diffraction loss for the actual path profiles from the earth station to the nearest shoreline.

The calculated PFD, including additional path losses to the closest shoreline, is -190.4dbW/ m^2/4 kHz. This is 23.4dB below the -167.0 dBW/ m^2/4 kHz interference criteria of the R&O 96-377. Therefore, there should be no interference to the U.S. Navy RADAR from the Hagerstown, Maryland earth station due to the distance and the terrain blockage between the site and the shore.

3. Potential Impact to NASA's Tracking and Data Relay Satellite System

The geographic location of the Intelsat earth station in Hagerstown, Maryland is outside the 390 km radius coordination contour surrounding NASA's White Sands, New Mexico ground station complex. Therefore the TDRSS space-to-earth link will not be impacted by the Intelsat earth station in Hagerstown, Maryland.

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 and EIRP of less than 71 dBW/6MHz in this band. The 13.1 meter earth station antenna will not transmit in this band. Therefore, there will be no potential interference to the TDRSS space-to-space link.

4. Coordination Result Summary and Conclusions

The results of the analysis and calculation performed in this exhibit indicate that compatible operation between the earth station at the Hagerstown, Maryland facility and U.S. Navy and NASA TDRSS space-to-earth and space-to-space links are possible. No interference to U.S. Navy RADAR or NASA TDRSS operations from the Hagerstown, Maryland site earth station should occur.

Radiation Hazard Report

Analysis of Non-Ionizing Radiation for a 13.1 m Earth Station

This analysis provides the calculated non-ionizing radiation levels for a 13.1-meter earth station system.

The methods and calculations performed in this analysis are based on the FCC Office of Engineering and Technology Bulletin, No.65, October1985 as 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 (Summarized in Annex 1). There are separate exposure limits applicable to the General Population/Uncontrolled Environment and the Occupational/Controlled Environment. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment for the frequency band of this antenna, is 1 mW/cm2 for a 30 minute or lower time period as shown in Annex 1 (a). The MPE limit for persons in an Occupational/Controlled environment for the frequency band of this antenna is 5 mW/cm2 for a 6 minute time or lower period as shown in Annex 1 (b). The purpose of this analysis described is to determine the power flux density levels of the earth station at the main reflector surface, the near-field, transition region, far-field, between the sub-reflector or feed and, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

The parameters of the antenna that is the subject of this analysis are shown in Table 1. Intermediate calculated values and constants are provided in Table 2.

Table 1. Input Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	13.1	m
Sub-reflector Diameter	D_{sr}	Input	160	cm
Frequency	F	Input	13750	MHz
Transmit Power	P	Input	750	W
Antenna Gain (dBi)	G_{es}	Input	63.6	dBi

Table 2. Calculated Values and Constants

Parameter	Symbol	Formula	Value	Units
Antenna Surface Area	$A_{surface}$	$\pi D^2/4$	134.78	m^2
Area of Sub-reflector	A_{sr}	$\pi D_{sr}^{\ 2}/4$	20106.19	cm^2
Wavelength	λ	300/F	0.021818	m
Antenna Gain (factor)	G	$10^{Ges/10}$	2290867.65	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2 D^2)$	0.64	n/a

1. Antenna Main Reflector Surface

The power density in the main reflector is determined from the Power level and the area of the main reflector aperture. This is determined from the following equation:

Power Density at the Main Reflector Surface:

$$S_{surface} = 4P/A_{surface} \quad (1)$$
$$= 22.258 \text{ W/m}^2$$
$$= 2.226 \text{ mW/cm}^2$$

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 is determined from the following equation:

Extent of the Near Field:

$$R_{nf} = D^2 / (4\lambda) \quad (2)$$
$$= 1966.36 \text{ m}$$

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

Near Field Density:

$$S_{nf} = 16.0\ \eta\ P / (\pi\ D^2) \quad (3)$$
$$= 1.433 \text{ mW/cm}^2$$

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 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 is determined from the following equation:

Transition Region Power Density:

$$S_t = S_{nf} R_{nf} / R_t \quad (4)$$
$$= 1.433 \text{ mW/cm}^2$$

4. Far Field Distance Calculation

The distance to the Far Field Region is calculated using the following equation:

Distance to Far Field Region:

$$R_{ff} = 0.6\ D^2 / \lambda \qquad (5)$$
$$= \quad 4719.275 \quad m$$

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

On-axis Power Density in the Far Field:

$$S_{ff} = G\ P / (4\ \pi\ R_{ff}^2) \qquad (6)$$
$$= \quad 0.614 \quad mW/cm^2$$

5. Region between the Main Reflector and the Ground

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

Power Density between Reflector and Ground:

$$S_g = P / A_{surface} \qquad (7)$$
$$= \quad 0.556 \quad mW/cm^2$$

6. Power Density at the Sub-reflector

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

Power Density at the Subreflector:

$$S_{sr} = 4000\ P / A_{sr} \qquad (8)$$
$$= \quad 149.208 \quad mW/cm^2$$

7. Summary of Calculations

Table 3. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Symbol	Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
1. Main Reflector	$S_{surface}$	2.226	Potential Hazard
2. Near Field (R_{nf} = 1966.36 m)	S_{nf}	1.433	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	1.433	Potential Hazard
4. Far Field (R_{ff} = 4719.28 m)	S_{ff}	0.614	Satisfies FCC MPE
5. Between Main Reflector and Subreflector	S_{sr}	149.208	Potential Hazard
6. Between Main Reflector and Ground	S_g	0.556	Satisfies FCC MPE

Table 4. Summary of Expected Radiation levels for Controlled Environment

Region	Symbol	Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
1. Main Reflector	$S_{surface}$	2.226	Satisfies FCC MPE
2. Near Field (R_{nf} = 1966.36 m)	S_{nf}	1.433	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	1.433	Satisfies FCC MPE
4. Far Field (R_{ff} = 4719.28 m)	S_{ff}	0.614	Satisfies FCC MPE
5. Between Main Reflector and Subreflector	S_{sr}	149.208	Potential Hazard
6. Between Main Reflector and Ground	S_g	0.556	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are no exposed to harmful levels of radiation.

8. Conclusion

Based upon the above analysis, it is concluded that harmful levels of radiation may exist in those regions noted for the Uncontrolled (Table 3) Environment and the Controlled Environment (Table 4).

The antenna is located at an Intelsat License LLC's teleport facility in Hagerstown, MD.
The teleport is a gated and fenced facility with secured access in and around the proposed antenna. The earth station will be marked with the standard radiation hazard warnings, as well as the area in the vicinity of the earth station to inform those in the general population, who might be working or otherwise present in or near the direct path of the main beam.

The applicant will ensure that the main beam of the antenna will be pointed at least one diameter away from any building, or other obstacles in those area that exceed the MPE levels. Since one diameter removed from the center of the main beam the levels are down by at least 20 dB, or by a factor of 100, these potential hazards do not exist for either the public, or for earth station personnel.

Finally, the earth station's operating personnel will not have access to areas that exceed the MPE levels, while the earth station is in operation. The transmitter will be turned off during those periods of maintenance, so that the MPE standard of 5.0 mW/cm^2 will be complied with for those regions in close proximity to the main reflector, which could be occupied by operating personnel.

"The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for workers."

ANNEX 1

(MPE Levels)

a) Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	0.2
300-1500	Frequency(MHz)*(4.0/1200)
1500-100,000	1

b) Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	1
300-1500	Frequency(MHz)*(4.0/1200)
1500-100,000	5