Approved by OMB
3060–0678

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATIONEnter a description of this application to identify it on the main menu:
Request for Special Temporary Authority to Operate a 13.1m C–band Antenna at Hagerstown, Maryland Teleport

1. Applicant

Name:	Intelsat License LLC	**Phone Number:**	703–559–7848
DBA Name:		**Fax Number:**	703–559–8539
Street:	c/o Intelsat US LLC 7900 Tysons One Place	**E–Mail:**	susan.crandall@intelsat.com
City:	McLean	**State:**	VA
Country:	USA	**Zipcode:**	22102 –5972
Attention:	Susan H. Crandall		

30days "with conditions"

GRANTED
International Bureau

File #SES-STA-20190830-01134

Call Sign N/A Grant Date 09/17/2019
(or other identifier)

Term Dates
From: 09/23/2019 To: 10/23/2019

Approved:

2. Contact

Name:	Cynthia J. Grady	**Phone Number:**	703–559–6949
Company:	c/o Intelsat US LLC	**Fax Number:**	703–559–8539
Street:	7900 Tysons One Place	E–Mail:	cynthia.grady@intelsat.com
City:	McLean	**State:**	VA
Country:	USA	**Zipcode:**	22102 –5972
Attention:		**Relationship:**	Legal Counsel

(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)
3. Reference File Number or Submission ID

4a. Is a fee submitted with this application?
◉ If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R.Section 1.1114).
○ Governmental Entity ○ Noncommercial educational licensee
○ Other(please explain):

4b. Fee Classification CGX – Fixed Satellite Transmit/Receive Earth Station

5. Type Request

○ Use Prior to Grant ○ Change Station Location ◉ Other

6. Requested Use Prior Date	
7. CityHagerstown	8. Latitude (dd mm ss.s h) 39 35 54.81 N

9. State MD	10. Longitude (dd mm ss.s h) 77 45 18.59 W

11. Please supply any need attachments.

Attachment 1: STA Request Attachment 2: Exhibit A Attachment 3: Exhibit B

12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)

Intelsat License LLC ('Intelsat') herein requests a grant of Special Temporary Authority for 30 days, beginning September 23, 2019, to allow Intelsat to utilize a 13.1m C-band antenna located at its Hagerstown, Maryland teleport for antenna verification testing.

13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti–Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes.

(●) Yes ( ) No

14. Name of Person Signing Cynthia J. Grady	15. Title of Person Signing Senior Counsel, Intelsat US LLC

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).

FCC NOTICE REQUIRED BY THE PAPERWORK REDUCTION ACT

The public reporting for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the required data, and completing and reviewing the collection of information. If you have any comments on this burden estimate, or how we can improve the collection and reduce the burden it causes you, please write to the Federal Communications Commission, AMD–PERM, Paperwork Reduction Project (3060–0678), Washington, DC 20554. We will also accept your comments regarding the Paperwork Reduction Act aspects of this collection via the Internet if you send them to PRA@fcc.gov. PLEASE DO NOT SEND COMPLETED FORMS TO THIS ADDRESS.

Remember – You are not required to respond to a collection of information sponsored by the Federal government, and the government may not conduct or sponsor this collection, unless it displays a currently valid OMB control number or if we fail to provide you with this notice. This collection has been assigned an OMB control number of 3060–0678.

THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104–13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.

30 days

GRANTED
International Bureau

File # SES-STA-20190830-01134

Call Sign N/A Grant Date 09/17/2019
(or other identifier)

Term Dates
From: 09/23/2019 To: 10/23/2019

Approved:

Applicant: Intelsat License LLC
Call Sign: N/A
File No.: SES-STA-20190830-01134
Special Temporary Authority (STA)

Intelsat License LLC ("Intelsat") is granted special temporary authority, for 30 days, beginning September 23, 2019 to operate 13.1 meter C-band antenna located in Hagerstown, Maryland to conduct antenna verification testing with "Intelsat Satellites" in the 5850-6725 MHz (Earth-to-space) and 3400-4200 MHz (space-to-Earth) frequency bands under the following conditions.

1. All operations may not exceed off-axis eirp limits established in § 25.218.

2. Operate on frequency currently authorized for Intelsat satellites.

3. Earth station antennas must not transmit at elevation angles less than five degrees, measured from the horizontal plane to the direction of maximum radiation.

4. All operations shall be on an unprotected and non-harmful interference basis, Intelsat, shall not cause harmful interference to, and shall not claim protection from, interference caused to it by any other lawfully operating station and it shall cease transmission(s) immediately upon notice of such interference and must inform the Commission, in writing, immediately of such an event.

5. The licensee shall, at all times, take all necessary measures to ensure that operation of this (these) authorized earth station(s) 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. Physical 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.

6. All operators of satellites will be provided with an emergency phone number where the licensee can be reached in the event that harmful interference occurs, Currently the 24x7 contact information Intelsat is Ph.: (703) 559-7701- East Coast Operations Center (primary)-(310)525-5591-West Coast Operations Center (back-up). Request to speak with Harry Burnham or Kevin Bell.

7. Grant of this authorization is without prejudice to any determination that the Commission may make on future Intelsat applications.

8. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at Intelsat's risk.

This action is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. §0.261, and is effective immediately.

INTELSAT.
Envision. Connect. Transform.

August 30, 2019

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Request for Special Temporary Authority to Operate a 13.1-meter C-band Antenna at Intelsat's Hagerstown, Maryland Teleport

Dear Ms. Dortch:

Intelsat License LLC ("Intelsat") herein requests a grant of Special Temporary Authority ("STA")[1] for 30 days, beginning September 23, 2019, to allow Intelsat to utilize a 13.1-meter C-band antenna located at its Hagerstown, Maryland teleport for antenna verification testing. Intelsat expects the testing to take approximately 60 days.

The proposed communication services will be performed in the 5850-6725 MHz (uplink) and 3400-4200 MHz (downlink) bands. Based on availability, Intelsat will be communicating with various Intelsat satellites for the testing.[2]

The 24x7 contact information for this testing is as follows:

Ph.: (703) 559-7701 – East Coast Operations Center (primary)
(310) 525-5591 – West Coast Operations Center (back-up)

Request to speak with Harry Burnham or Kevin Bell.

In further support of this request, Intelsat herewith attaches Exhibits A and B, which contain technical information that demonstrates that the operation of the earth station will be compatible with its electromagnetic environment and will not cause harmful interference into any lawfully operating terrestrial facility, as well as a radiation hazard analysis report. In the extremely unlikely event that

[1] Intelsat has filed its STA request, an FCC Form 159, a $210.00 filing fee, and this supporting letter electronically via the International Bureau's Filing System ("IBFS").

[2] All operations will be in accordance with the relevant coordination agreements.

harmful interference should occur due to transmissions to or from its earth station, Intelsat will take all reasonable steps to eliminate the interference.

Grant of this STA request will help ensure this antenna is operational prior to its use during a power upgrade at Intelsat's Hagerstown, Maryland teleport later this year, which in turn will ensure customer service during the upgrade. As such this request is in the public interest.

Please direct any questions regarding this request to the undersigned at (703) 559-6949.

Respectfully submitted,

/s/ Cynthia J. Grady

Cynthia J. Grady
Senior Counsel
Intelsat US LLC

cc: Paul Blais

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
July 02, 2019

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.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

Company

State of Maryland MIEMSS Communications
USCOC of Cumberland, Inc.
Washington Gas Light Company
WV DHSEM, SIRN System

No other carriers reported potential interference cases.

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 06/03/2019.

Company
Adams County Department of Emergency Svc
Affiniti PA, LLC
Anne Arundel, County of
Appalachia Engineering Services
AQ2AT LLC
Argos Engineering, LLC
AT&T Corp.
Atlantic Broadband (Penn), LLC
Atlantic City Electric Company
Atlantic Coast Pipeline, LLC
Baltimore County of Maryland
Baltimore Gas and Electric Company
Beaver Springs Faith Baptist Church, Inc
Bedford County of
Believe Wireless, LLC
Blair County 911
Calvert Cliffs Nuclear Power Plant
Calvert, County of
Cambria, County of
Capital Communications of America
Carroll, County of
Cellco Partnership - Bridgeville, PA/WV
Cellco Partnership-WDC/Baltimore
Cellco Prtnrshp - Phil. Tri-State Rgn
Charles, County of
Chester, County of
Columbia Gas Transmission, LLC
Commonwealth of Pennsylvania
Commonwealth of Pennsylvania-Radio Proj.
Comprehensive Wireless LLC
County of Centre
County of Culpeper
County of Fayette
County of Fayette
County of Frederick
County of Orange, VA
County of York
Cumberland, County of (PA)
Dauphin County Emergency Management
DC2A LLC

Delaware Division of Communications
Delmarva Power and Light Company
Dominion Energy Transmission, Inc.
Eastern MLG LLC
Egan LLC
Enoch Pratt Free Library
Entercom License, LLC
Equitable Gas Company
Exelon Generation Company, LLC
FELHC, Inc.
Franklin County Dept. of Emergency Servi
Fulton County PA
Fundamental Broadcasting LLC
Garden State Transmissions
GEORGE WASHINGTON UNIVERSITY
Getwireless.Net
GTT America LLC
Hardy Cellular Telephone Company
Hardy County OEM/E911
Harrison County Emergency Services
Harrisonburg-Rockingham ECC
Hearst Properties Inc.
High Voltage Communications LLC (CFN)
Howard, County of
Huntingdon, County of
iSignal
Juniata County Emergency Services
Lancaster County-Wide Communications
Lebanon, County of
Loudoun, County of
Maryland Public Broadcasting Commission
Maryland State Dept of General Services
Maryland State Highway Administration
Maryland, State of - Dept.of Info & Tech
Maryland, State of - DNR
Maryland, State of - MDOT-MTA
MCI Communications Services Inc.
Mifflin County
Mifflin County
Montgomery, County of
Morgan, County of
Mountain State Communications, llc
New Cingular Wireless PCS - Maryland
New Cingular Wireless PCS LLC - DC
New Cingular Wireless PCS LLC - VA
New Cingular Wireless PCS LLC - WV,NC,SC
New Cingular Wireless PCS, LLC - PA
New Jersey, State of -NJ Transit
New Line Networks, LLC
Norfolk Southern Railway
Peco Energy Company
Pennsylvania Sports Entertainment Netwo.
Pennsylvania State Police
Pennsylvania Turnpike Commission
Perry, County of
Pittsburgh SMSA Limited Partnership

Potomac Electric Power Company
Preston County Office of Emergency Manag
Prince George's County
Prince William, County of
PSEG Services Corporation
Radio License Holding CBC, LLC
Radio One Inc
Rappahannock Electric Cooperative
RCYM Holdings LLC
Redi-Call Communications Company
Rural Broadband, LLC
Secom Net
Shenandoah Personal Communications, LLC
Shenandoah Valley Electric Cooperative
Snyder, County of
Somerset, County of
South Central Task Force (SCTFNET)
Southern Maryland Electric Cooperative I
Stafford, County of
State of Maryland MIEMSS Communications
Texas Eastern Communications, LLC
Thought Transmissions, LLC
T-Mobile License LLC
Transcontinental Gas Pipeline Corp.
Triangle Communications, Inc.
Uniti Fiber PEG, LLC
Ursa Navigation Solutions, Inc.
US Cellular Operating Company, LLC (WI)
USCOC of Cumberland, Inc.
USOC of Pennsylvania RSA No 10 B2 Inc.
Verizon Wireless (VAW) LLC - Maryland
Verizon Wireless (VAW) LLC - W/B/V Mkts
Verizon Wireless (VAW) LLC-Pennsylvania
Virginia Department of State Police
Virginia Electric & Power Company
Warrenton Fauquier Joint Communications
Washington Gas Light Company
Washington Suburban Sanitary Commission
Westmoreland, County of
Williamson Enterprise LLC
Wireless Internetwork LLC
World Class Wireless, LLC
WV DHSEM, SIRN System

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:	07/02/2019
Job Number:	190603COMSGE02

Administrative Information

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

Site Information — HAGERSTOWN, MD

Venue Name	
Latitude (NAD 83)	39° 35' 54.8" N
Longitude (NAD 83)	77° 45' 18.6" W
Climate Zone	A
Rain Zone	2
Ground Elevation (AMSL)	168.65 m / 553.3 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)	5.79 m / 19.0 ft

Antenna Information		Receive - FCC32		Transmit - FCC32	
Manufacturer		Gen Dynamics		Gen Dynamics	
Model		Satcom		Satcom	
Gain / Diameter		53.0 dBi / 13.1 m		56.6 dBi / 13.1 m	
3-dB / 15-dB Beamwidth		0.38° / 0.76°		0.26° / 0.52°	
Max Available RF Power	(dBW/4 kHz)			(1) -11.8	(2) -2.6
	(dBW/MHz)			12.2	
Maximum EIRP	(dBW/4 kHz)			44.8	54.0
	(dBW/MHz)			68.8	78.0
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%

Frequency Information	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	500KG7D - 72M0G7W / 3400.0 - 4200.0 500KG7D - 72M0F7W / 3400.0 - 4200.0	(1) 6M00F7W - 72M0G7W / 5850.0 - 6425.0 6425.0 – 6538.0, 6572.0 – 6583.0, 6622.0 – 6628.0 6701.0 – 6725.0 (1) 1M00F7D – 1M50F7D / 6172.0 – 6178.0 (2) 1M00F7D – 1M50F7D / 5924.0 – 5927.5, 6414.25 – 6425.25
Max Great Circle Coordination Distance	714.8 km / 444.1 mi	334.7 km / 208.0 mi
Precipitation Scatter Contour Radius	613.5 km / 381.1 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

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

Coordination Values	**HAGERSTOWN, MD**			
Licensee Name	Intelsat License LLC			
Latitude (NAD 83)	39° 35' 54.8" N			
Longitude (NAD 83)	77° 45' 18.6" W			
Ground Elevation (AMSL)	168.65 m / 553.3 ft			
Antenna Centerline (AGL)	5.79 m / 19.0 ft			
Antenna Model	Gen Dynamics 13.1 meter			
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-11.8 (dBW/4 kHz)	

			Receive 4.0 GHz		Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.26	101.82	-10.00	278.03	-10.00	134.03
5	0.23	96.84	-10.00	282.07	-10.00	135.50
10	0.21	91.86	-10.00	283.43	-10.00	136.42
15	0.00	86.88	-10.00	285.28	-10.00	137.70
20	0.22	81.90	-10.00	283.11	-10.00	136.21
25	0.00	76.93	-10.00	285.28	-10.00	137.70
30	0.00	71.95	-10.00	285.28	-10.00	137.70
35	0.23	66.96	-10.00	281.82	-10.00	135.32
40	0.00	62.00	-10.00	285.28	-10.00	137.70
45	0.00	57.03	-10.00	285.28	-10.00	137.70
50	0.00	52.06	-10.00	285.28	-10.00	137.70
55	0.00	47.10	-9.82	286.40	-9.82	138.21
60	0.00	42.14	-8.62	294.22	-8.62	141.83
65	0.00	37.19	-7.26	303.29	-7.26	146.09
70	0.00	32.26	-5.72	314.61	-5.72	151.23
75	0.00	27.35	-3.92	327.40	-3.92	157.55
80	0.00	22.47	-1.79	343.07	-1.79	165.56
85	0.00	17.66	0.83	362.97	0.83	177.36
90	0.00	12.98	4.17	388.85	4.17	190.25
95	0.00	8.67	8.55	426.04	8.55	205.38
100	0.00	5.62	13.26	714.76	13.26	334.72
105	0.00	6.15	12.27	528.20	12.27	243.34
110	0.00	9.60	7.45	416.38	7.45	202.80
115	0.00	13.27	3.93	387.53	3.93	189.33
120	0.00	16.89	1.31	366.72	1.31	179.23
125	0.00	20.41	-0.75	350.91	-0.75	171.25
130	0.00	23.83	-2.43	338.33	-2.43	163.11
135	0.00	27.11	-3.83	328.09	-3.83	157.89
140	0.00	30.23	-5.01	319.61	-5.01	153.67
145	0.00	33.14	-6.01	311.94	-6.01	150.23
150	0.00	35.82	-6.85	306.10	-6.85	147.43
155	0.00	38.20	-7.55	301.33	-7.55	145.16
160	0.00	40.26	-8.12	297.51	-8.12	143.36
165	0.00	41.93	-8.56	294.59	-8.56	142.00
170	0.00	43.16	-8.88	292.52	-8.88	141.03
175	0.00	43.92	-9.07	291.29	-9.07	140.46
180	0.00	44.18	-9.13	290.88	-9.13	140.27
185	0.00	43.92	-9.07	291.28	-9.07	140.46

COMSEARCH

Earth Station Data Sheet

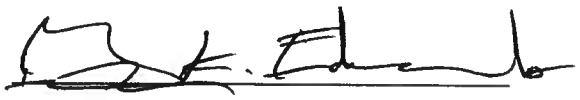
19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 http://www.comsearch.com

Coordination Values	**HAGERSTOWN, MD**			
Licensee Name	Intelsat License LLC			
Latitude (NAD 83)	39° 35' 54.8" N			
Longitude (NAD 83)	77° 45' 18.6" W			
Ground Elevation (AMSL)	168.65 m / 553.3 ft			
Antenna Centerline (AGL)	5.79 m / 19.0 ft			
Antenna Model	Gen Dynamics 13.1 meter			
Antenna Mode	Receive 4.0 GHz		Transmit 6.1 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-11.8 (dBW/4 kHz)	

			Receive 4.0 GHz		Transmit 6.1 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	292.52	-8.88	141.03
195	0.00	41.93	-8.56	294.59	-8.56	142.00
200	0.00	40.26	-8.12	297.51	-8.12	143.36
205	0.00	38.20	-7.55	301.32	-7.55	145.16
210	0.00	35.81	-6.85	306.10	-6.85	147.43
215	0.21	32.98	-5.96	311.25	-5.96	149.62
220	0.00	30.22	-5.01	319.62	-5.01	153.68
225	0.26	26.92	-3.75	320.23	-3.75	151.63
230	0.30	23.62	-2.33	325.81	-2.33	152.98
235	0.00	20.42	-0.75	350.90	-0.75	171.24
240	0.00	16.89	1.31	366.75	1.31	179.24
245	0.24	13.11	4.06	382.65	4.06	185.18
250	0.25	9.42	7.65	410.95	7.65	198.33
255	0.27	6.09	12.38	536.32	12.38	245.35
260	0.30	5.82	12.87	690.10	12.87	321.20
265	0.28	9.01	8.13	412.05	8.13	197.94
270	0.29	13.34	3.87	374.63	3.87	179.26
275	0.30	18.01	0.61	347.75	0.61	163.78
280	0.28	22.83	-1.96	330.80	-1.96	156.06
285	0.21	27.72	-4.07	325.29	-4.07	156.19
290	0.00	32.66	-5.85	313.67	-5.85	150.77
295	0.00	37.58	-7.38	302.52	-7.38	145.73
300	0.00	42.52	-8.72	293.58	-8.72	141.52
305	0.24	47.45	-9.91	280.72	-9.91	134.44
310	0.00	52.43	-10.00	285.28	-10.00	137.70
315	0.00	57.40	-10.00	285.28	-10.00	137.70
320	0.00	62.36	-10.00	285.28	-10.00	137.70
325	0.00	67.33	-10.00	285.28	-10.00	137.70
330	0.23	72.30	-10.00	281.61	-10.00	135.18
335	0.28	77.27	-10.00	275.05	-10.00	132.04
340	0.28	82.25	-10.00	274.82	-10.00	131.89
345	0.22	87.23	-10.00	282.80	-10.00	135.99
350	0.21	92.20	-10.00	283.72	-10.00	136.62
355	0.29	97.18	-10.00	274.21	-10.00	131.48

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: July 02, 2019

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	160.02	cm
Frequency	F	Input	6138	MHz
Transmit Power	P	Input	2800	W
Antenna Gain (dBi)	G_{es}	Input	56.6	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}	$\pi D_{sr}^2/4$	20111.22	cm^2
Wavelength	λ	300/F	0.048876	m
Antenna Gain (factor)	G	$10^{Ges/10}$	457088.19	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2D^2)$	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:

$$S_{surface} = 4P/A_{surface} \qquad (1)$$
$$= 83.097 \quad W/m^2$$
$$= 8.310 \quad mW/cm^2$$

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:

$$R_{nf} = D^2 / (4\lambda) \qquad (2)$$
$$= 877.79 \quad m$$

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

Near Field Density:

$$S_{nf} = 16.0\ \eta\ P / (\pi\ D^2) \qquad (3)$$
$$= 5.357 \quad mW/cm^2$$

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:

$$S_t = S_{nf}\ R_{nf} / R_t \qquad (4)$$
$$= 5.357 \quad mW/cm^2$$

4. Far Field Distance Calculation

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

Distance to Far Field Region:

$$R_{ff} = 0.6\, D^2 / \lambda \qquad (5)$$
$$= 2106.684 \quad m$$

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

On-axis Power Density in the Far Field:

$$S_{ff} = G\, P / (4\, \pi\, R_{ff}^2) \qquad (6)$$
$$= 2.295 \quad mW/cm^2$$

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:

$$S_g = P / A_{surface} \qquad (7)$$
$$= 2.077 \quad mW/cm^2$$

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:

$$S_{sr} = 4000\, P / A_{sr} \qquad (8)$$
$$= 556.903 \quad mW/cm^2$$

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	$S_{surface}$	8.310	Potential Hazard
2. Near Field (R_{nf} = 877.79 m)	S_{nf}	5.357	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	5.357	Potential Hazard
4. Far Field (R_{ff} = 2106.68 m)	S_{ff}	2.295	Potential Hazard
5. Between Main Reflector and Subreflector	S_{sr}	556.903	Potential Hazard
6. Between Main Reflector and Ground	S_g	2.077	Potential Hazard

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	$S_{surface}$	8.310	Potential Hazard
2. Near Field (R_{nf} = 877.79 m)	S_{nf}	5.357	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	5.357	Potential Hazard
4. Far Field (R_{ff} = 2106.68 m)	S_{ff}	2.295	Satisfies FCC MPE
5. Between Main Reflector and Subreflector	S_{sr}	556.903	Potential Hazard
6. Between Main Reflector and Ground	S_g	2.077	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, Virginia. 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