

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:
Request for Special Temporary Authority to Operate a 9m Ku-band Antenna at Napa, CA Teleport

1. Applicant

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



File # SES-STA 20161003-00826

Call Sign Grant Date 10-6-16
(or other identifier)

Term Dates
From: 10-7-16 To: 11-7-16


Approved: Susan H. Crandall

Applicant: Intelsat License LLC.
File No.: SES-STA-20161003-00826
Call Sign: None

Intelsat License LLC. (Intelsat) is granted special temporary authority for 30 days, beginning October 7, 2016, to operate its fixed earth station in Napa, California to provide communications services to/from the Yamal-300K satellite at the 183.0° E.L. orbital location in the 14.0–14.5 GHz (Earth-to-space) and 10.95–11.7 GHz (space-to-Earth) frequency bands on the following conditions:

1. In the event of any harmful interference as a result of operations under this grant of STA, Intelsat shall cease operations immediately upon notification of such interference and shall immediately inform the Commission, in writing, of such an event.
2. All operations shall be on an unprotected, non-interference basis to both government and non-government operations.
3. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at Intelsat's own risk.
4. Grant of this authorization is without prejudice to any determination that the Commission may make regarding any pending or future Intelsat applications.
5. All emissions are limited to the power levels coordinated.
6. Transmissions between Intelsat's fixed earth station in Napa, California and the Yamal 300K space station are limited to the provision of gateway services in the 10.95-11.7 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) frequency bands.

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.

 GRANTED International Bureau	File # <u>SES-STA-20161003-00826</u>
	Call Sign _____ Grant Date <u>10/6/2016</u> (or other identifier)
	Term Dates From <u>10/7/2016</u> To: <u>11/7/2016</u>
	Approved: <u>Paul E. Hladik</u>

2. Contact			
Name:	Cynthia J. Grady	Phone Number:	703559-6949
Company:	Intelsat Corporation	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?			
<input checked="" type="radio"/> If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).			
<input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee			
<input type="radio"/> Other (please explain):			
4b. Fee Classification CGX - Fixed Satellite Transmit/Receive Earth Station			
5. Type Request			
<input type="radio"/> Use Prior to Grant <input type="radio"/> Change Station Location <input checked="" type="radio"/> Other			
6. Requested Use Prior Date			
8. Latitude			
(dd mm ss.s h) 0 0 0.0			
7. City/Napa			

9. State CA	10. Longitude (dd mm ss.s h) 0 0 0.0
11. Please supply any need attachments. Attachment 1: STA Request	Attachment 2: Exhibit A Attachment 3: Exhibit B
<p>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.)</p> <div style="border: 1px solid black; padding: 5px;"> <p>Intelsat License LLC herein requests a grant of Special Temporary Authority for 30 days, beginning October 7, 2016, to allow Intelsat to utilize a 9 meter Ku-band antenna located at its Napa, California teleport to provide communications services to/from the Yamal 300K satellite at 183.0 E.L. Intelsat expects shortly to file a permanent license application</p> </div>	
<p>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.</p> <p style="text-align: right;">Yes <input checked="" type="radio"/> No <input type="radio"/></p>	
14. Name of Person Signing Cynthia J. Grady	15. Title of Person Signing Regulatory Counsel, Intelsat Corporation
<p style="text-align: center;">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).</p>	

FCC NOTICE REQUIRED BY THE PAPERWORK REDUCTION ACT

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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.

12. Description

Intelsat License LLC herein requests a grant of Special Temporary Authority for 30 days, beginning October 7, 2016, to allow Intelsat to utilize a 9 meter Ku-band antenna located at its Napa, California teleport to provide communications services to/from the Yamal 300K satellite at 183.0 E.L. Intelsat expects shortly to file a permanent license application for this antenna.

October 3, 2016

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 9 meter Ku-band Antenna at
Intelsat's Napa, California Teleport
Expedited Treatment Requested

Dear Ms. Dortch:

Intelsat License LLC ("Intelsat") herein requests an expedited grant of Special Temporary Authority ("STA")¹ for 30 days, beginning October 7, 2016, to allow Intelsat to utilize a 9 meter Ku-band antenna located at its Napa, California teleport to provide communications services to/from the Yamal-300K satellite at 183.0° E.L. Intelsat expects shortly to file a permanent license application for this antenna.

The proposed communication services will be performed in the 14.0–14.5 GHz (Earth-to-space) and 10.95–11.7 GHz (space-to-Earth) band. Although the Yamal 300K satellite is not on the Permitted Space Station list, U.S. earth station access to the satellite has already been approved.² Intelsat requests use of the antenna in order to accommodate a customer that requires additional capacity over the Pacific that cannot be provided on the customer's current Intelsat satellite.

In support of this request, Intelsat is attaching Exhibits A and B, which provide relevant technical parameters and a radiation hazard report.

Grant of this STA request serves the public interest by enabling Intelsat to meet customer demand for additional capacity.

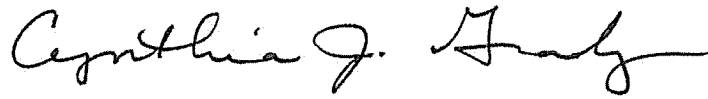
¹ Intelsat has filed its STA request, an FCC Form 159, a \$200.00 filing fee, and this supporting letter electronically via the International Bureau's Filing System ("IBFS").

² See, e.g. *Satellite Communications Services Information; Actions Taken*, Report No. SES-01864, File No. SES-MFS-20160404-00304 (June 29, 2016) (Public Notice).

Ms. Marlene H. Dortch
October 3, 2016
Page 2

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

Respectfully submitted,

A handwritten signature in black ink, reading "Cynthia J. Grady". The signature is written in a cursive style with a large, stylized initial "C".

Cynthia J. Grady
Regulatory Counsel
Intelsat Corporation

Cc: Paul Blais

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Intelsat License LLC
NAPA, CA
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
October 03, 2016

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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 09/01/2016.

Company

AMFM Broadcasting Licenses, LLC
AT&T Mobility Spectrum LLC - N CA
AT&T Mobility Wireless Operations Hldgs
Advanced Technology Distributors, Inc.
Alameda County of California
Alpha Media Licensee LLC
Antioch, City of
Ayeria Technologies Inc
BUTTE, COUNTY OF
CALAVERAS COUNTY SHERIFF'S DEPARTMENT
CBS Broadcasting Inc
CBS Communication Services Inc
CCT Telecomm, Inc.
CENTRAL VALLEY CABLE TV, LLC
CITY OF LODI
CONTRA COSTA COUNTY COMMUNICATIONS DEPT.
Cal.net, Inc.
California Internet Solutions, Inc.
California RSA No. 3 Limited Partnership
California Rural Service Area #1, Inc.
California Water Service Company
California, State of
Cellco Partnership - Southern California
Central Valley Broadband
Citizens Telecommunications of CA Inc.
City & County of San Francisco PUC
City of Oakland
City of Woodland
Clearwire Spectrum Holdings II, LLC
Clearwire Spectrum Holdings III, LLC
Clearwire Spectrum Holdings LLC
Coastside Net, Inc.
Commnet Four Corners, LLC
Commnet of Nevada, LLC
Conifer Communications
Conterra Ultra Broadband, LLC
Contra Costa Water District
County of Sacramento - ECS-Network
County of Sacramento - ECS-Network
County of San Mateo

DM-TECH INC
DigitalPath, Inc
East Bay Municipal Utility District
East Bay Regional Park
Encore Business Systems
Ether Web Network, Inc.
Etheric Networks, Inc.
Farmwald, Dr. Paul M
Field, David J
Fixed Wireless Holdings, LLC
GTE Mobilnet of California LTD Partnersh
Glenn County Office of Education
Hayward, City of
Interwest Management Services Inc.
Johannesen, Norman A
John K LaRue
KGO Television, Inc.
KTXL, LLC
Lake County
Lyon, Mike
M.U.T. Licensing, LLC
MENDOCINO COUNTY OF
MHO Networks
Marin County of California
Mediacom California LLC
Midpeninsula Regional Open Space Dist.
Mimosa Networks
Modesto Irrigation District
Monte Leon LLC
Muir Beach LAN, LLC
NBC Telemundo License Co. - KNTV
NORTHERN CALIFORNIA POWER AGENCY
Napa, City of
New Cingular Wireless PCS LLC - N CAL
New Cingular Wireless PCS LLC - N Texas
NextEra Energy Operating Services, LLC
Nextlink Wireless, LLC
Nextweb Inc
Nor Cal Reg Pub Safety Traing Coll - JPA
North Coast Internet
Olympic Wireless, LLC
Pacific Bell Tel Com dba AT&T California
Pacific Gas and Electric Company
Personal Network Computing, Inc.
Proxim Wireless Corporation
Radio License Holding VIII, LLC
Redding MSA Limited Partnership
Regents of the University of California
Ricketts, Curtis W
River Delta Wireless
Ruralnet
SAN FRANCISCO CITY & COUNTY CALIFORNIA
Sacramento County
Sacramento Television Stations, Inc
Sacramento Valley Limited Partnership
San Francisco, City and County of

San Francisco, City and County of
San Joaquin County
San Jose, City of (ECOMM)
Santa Clara Valley Transportation Auth
Sierra Nevada Communications
Silicon Valley Regional Interop Authorit
SmarterBroadband Inc.
Softcom Internet Communications, Inc.
Solano County Communications Division
Sonoma, County of
South San Joaquin Irrigation District
Southern California Edison Company
Sprint Spectrum L.P.
Sprintcom, Inc
St Francis Yacht Club
Sutro Tower Inc.
T-Mobile License LLC
Tekify, LLC
Telepath Corporation
The Internet Store, Inc.
Towerstream Corp.
Union Pacific Railroad Company
Valley Electric Association, Inc
Valley Internet
Varnet, Inc.
Velociter Wireless, Inc.
Verizon California Inc.
Verizon Wireless (VAW) LLC-N CA/NV
Vista Broadband Networks, Inc.
Webpass Inc.
Webperception, LLC
WiLine Networks Inc.
Wiline Spectrum Holdings LLC
Winters Broadband
XILLIENT, LLC
Zeta Broadband, LLC
enXco, Inc.
unWired Broadband, Inc

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: 10/03/2016
Job Number: 160901COMSGE04

Administrative Information

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

Site Information NAPA, CA

Venue Name
Latitude (NAD 83) 38° 14' 41.0" N
Longitude (NAD 83) 122° 16' 44.0" W
Climate Zone A
Rain Zone 3
Ground Elevation (AMSL) 13.51 m / 44.3 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 50° W to 194° West Longitude
Azimuth Range 101.2° to 258.4°
Corresponding Elevation Angles 5.2° / 5.6°
Antenna Centerline (AGL) 5.49 m / 18.0 ft

Antenna Information

Manufacturer
Model
Gain / Diameter
3-dB / 15-dB Beamwidth

Receive - FCC32

Vertex
9.0 KPK
58.6 dBi / 9.0 m
0.20° / 0.38°

Transmit - FCC32

Vertex
9.0 KPK
60.1 dBi / 9.0 m
0.16° / 0.32°

Max Available RF Power (dBW/4 kHz)
(dBW/MHz)

-14.0
10.0

Maximum EIRP (dBW/4 kHz)
(dBW/MHz)

46.1
70.1

Interference Objectives: Long Term -156.0 dBW/MHz 20%
Short Term -146.0 dBW/MHz 0.01%

-151.0 dBW/4 kHz 20%
-128.0 dBW/4 kHz 0.0025%

Frequency Information

Emission / Frequency Range (MHz)

Receive 11.0 GHz

7M10G7W - 14M0G7W / 10950.0 - 11200.0
7M10G7W - 14M0G7W / 11450.0 - 11700.0

Transmit 14.0 GHz

7M10G7W - 14M0G7W / 14000.0 - 14500.0

Max Great Circle Coordination Distance
Precipitation Scatter Contour Radius

646.6 km / 401.7 mi
420.7 km / 261.4 mi

287.4 km / 178.5 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

NAPA, CA

Licensee Name	Intelsat License LLC		
Latitude (NAD 83)	38° 14' 41.0" N		
Longitude (NAD 83)	122° 16' 44.0" W		
Ground Elevation (AMSL)	13.51 m / 44.3 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Model	Vertex 9 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	-14.0 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 11.0 GHz		Transmit 14.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	101.15	-10.00	231.37	-10.00	115.80
5	0.00	96.17	-10.00	231.37	-10.00	115.80
10	0.84	91.19	-10.00	189.84	-10.00	100.00
15	0.50	86.20	-10.00	204.27	-10.00	100.00
20	0.48	81.22	-10.00	205.77	-10.00	100.00
25	0.51	76.24	-10.00	203.74	-10.00	100.00
30	1.57	71.23	-10.00	159.72	-10.00	100.00
35	2.00	66.23	-10.00	146.56	-10.00	100.00
40	2.00	61.24	-10.00	146.47	-10.00	100.00
45	2.95	56.22	-10.00	128.34	-10.00	100.00
50	2.94	51.23	-10.00	128.56	-10.00	100.00
55	3.68	46.21	-9.62	116.95	-9.62	100.00
60	3.82	41.21	-8.37	119.08	-8.37	100.00
65	4.61	36.20	-6.97	113.41	-6.97	100.00
70	4.67	31.19	-5.35	118.59	-5.35	100.00
75	4.32	26.20	-3.46	130.68	-3.46	100.00
80	4.23	21.21	-1.16	140.39	-1.16	100.00
85	4.05	16.23	1.74	158.27	1.74	100.00
90	3.91	11.26	5.71	186.20	5.71	100.00
95	3.05	6.54	11.61	232.07	11.61	100.00
100	3.46	2.08	24.04	646.56	24.04	287.38
105	3.25	4.15	16.56	350.31	16.56	140.56
110	4.02	7.44	10.22	204.91	10.22	100.00
115	4.84	10.61	6.35	173.20	6.35	100.00
120	5.65	13.70	3.58	143.62	3.58	100.00
125	6.35	16.74	1.41	127.64	1.41	100.00
130	6.77	19.82	-0.43	116.02	-0.43	100.00
135	6.55	23.21	-2.14	111.82	-2.14	100.00
140	5.94	26.73	-3.68	112.15	-3.68	100.00
145	6.26	29.31	-4.68	105.22	-4.68	100.00
150	6.02	32.07	-5.65	104.09	-5.65	100.00
155	6.79	33.65	-6.17	100.00	-6.17	100.00
160	5.50	36.70	-7.12	103.50	-7.12	100.00
165	5.78	37.95	-7.48	100.00	-7.48	100.00
170	5.20	39.60	-7.94	103.23	-7.94	100.00
175	4.54	40.92	-8.30	109.40	-8.30	100.00
180	4.46	41.23	-8.38	110.13	-8.38	100.00
185	4.55	40.91	-8.30	109.31	-8.30	100.00

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Coordination Values

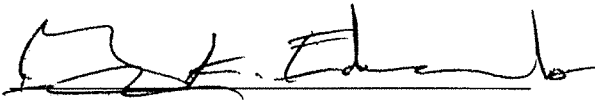
NAPA, CA

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Antenna Model	Vertex 9 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		-14.0 (dBW/4 kHz)	

Azimuth (°)	Receive 11.0 GHz		Transmit 14.0 GHz			
	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	4.87	39.92	-8.03	106.26	-8.03	100.00
195	5.07	38.62	-7.67	105.39	-7.67	100.00
200	4.47	37.63	-7.39	113.66	-7.39	100.00
205	4.88	35.32	-6.70	110.92	-6.70	100.00
210	4.20	33.59	-6.15	121.69	-6.15	100.00
215	4.28	30.89	-5.25	124.10	-5.25	100.00
220	3.57	28.54	-4.39	137.68	-4.39	100.00
225	2.77	26.01	-3.38	160.84	-3.38	100.00
230	2.02	23.22	-2.14	188.61	-2.14	100.00
235	1.30	20.24	-0.66	211.83	-0.66	100.00
240	0.62	17.11	1.17	249.51	1.17	115.88
245	0.00	13.82	3.48	297.76	3.48	152.74
250	0.00	10.05	6.94	320.76	6.94	167.04
255	0.00	6.57	11.56	430.66	11.56	202.74
260	0.26	5.56	13.37	621.32	13.37	276.80
265	0.42	8.35	8.95	308.30	8.95	150.72
270	0.45	12.64	4.46	279.85	4.46	133.11
275	0.46	17.32	1.04	259.75	1.04	124.09
280	0.44	22.14	-1.63	247.30	-1.63	118.21
285	0.42	27.02	-3.79	238.69	-3.79	114.44
290	0.81	31.88	-5.59	207.34	-5.59	100.00
295	0.96	36.81	-7.15	196.48	-7.15	100.00
300	0.84	41.78	-8.52	196.46	-8.52	100.00
305	1.08	46.73	-9.74	180.34	-9.74	100.00
310	0.67	51.73	-10.00	198.42	-10.00	100.00
315	0.90	56.69	-10.00	186.98	-10.00	100.00
320	0.88	61.66	-10.00	187.93	-10.00	100.00
325	0.99	66.64	-10.00	182.26	-10.00	100.00
330	0.74	71.63	-10.00	195.13	-10.00	100.00
335	0.00	76.62	-10.00	231.37	-10.00	115.80
340	0.00	81.60	-10.00	231.37	-10.00	115.80
345	0.00	86.57	-10.00	231.37	-10.00	115.80
350	0.00	91.55	-10.00	231.37	-10.00	115.80
355	0.00	96.53	-10.00	231.37	-10.00	115.80

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: October 03, 2016

Radiation Hazard Report

Analysis of Non-Ionizing Radiation for a 9 m Earth Station

This analysis provides the calculated non-ionizing radiation levels for a 9-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, October 1985 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	9	m
Sub-reflector Diameter	D _{sr}	Input	116.84	cm
Frequency	F	Input	14197.1	MHz
Transmit Power	P	Input	125	W
Antenna Gain (dBi)	G _{es}	Input	60.1	dBi

Table 2. Calculated Values and Constants

Parameter	Symbol	Formula	Value	Units
Antenna Surface Area	A _{surface}	$\pi D^2/4$	63.62	m ²
Area of Sub-reflector	A _{sr}	$\pi D_{sr}^2/4$	10721.93	cm ²
Wavelength	λ	300/F	0.021131	m
Antenna Gain (factor)	G	10 ^{Ges/10}	1023292.99	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2 D^2)$	0.57	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:

$$\begin{aligned} S_{\text{surface}} &= 4P/A_{\text{surface}} && (1) \\ &= 7.860 \quad \text{W/m}^2 \\ &= 0.786 \quad \text{mW/cm}^2 \end{aligned}$$

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:

$$\begin{aligned} R_{\text{nf}} &= D^2 / (4\lambda) && (2) \\ &= 958.30 \quad \text{m} \end{aligned}$$

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

Near Field Density:

$$\begin{aligned} S_{\text{nf}} &= 16.0 \eta P / (\pi D^2) && (3) \\ &= 0.449 \quad \text{mW/cm}^2 \end{aligned}$$

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:

$$\begin{aligned} S_t &= S_{\text{nf}} R_{\text{nf}} / R_t && (4) \\ &= 0.449 \quad \text{mW/cm}^2 \end{aligned}$$

4. Far Field Distance Calculation

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

Distance to Far Field Region:

$$\begin{aligned} R_{ff} &= 0.6 D^2 / \lambda \\ &= 2299.930 \text{ m} \end{aligned} \quad (5)$$

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

On-axis Power Density in the Far Field:

$$\begin{aligned} S_{ff} &= G P / (4 \pi R_{ff}^2) \\ &= 0.192 \text{ mW/cm}^2 \end{aligned} \quad (6)$$

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:

$$\begin{aligned} S_g &= P / A_{\text{surface}} \\ &= 0.196 \text{ mW/cm}^2 \end{aligned} \quad (7)$$

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:

$$\begin{aligned} S_{sr} &= 4000 P / A_{sr} \\ &= 46.633 \text{ mW/cm}^2 \end{aligned} \quad (8)$$

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}	0.786	Satisfies FCC MPE
2. Near Field ($R_{\text{nf}} = 958.3 \text{ m}$)	S_{nf}	0.449	Satisfies FCC MPE
3. Transition Region ($R_{\text{nf}} < R_{\text{t}} < R_{\text{ff}}$)	S_{t}	0.449	Satisfies FCC MPE
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5. Between Main Reflector and Subreflector	S_{sr}	46.633	Potential Hazard
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Table 4. Summary of Expected Radiation levels for Controlled Environment

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It is the applicant's responsibility to ensure that the public and operational personnel are not 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 Napa, California.

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/cm²)
30-300	0.2
300-1500	Frequency(MHz)*(4.0/1200)
1500-100,000	1

b) Limits for Occupational/Controlled Exposure (MPE)

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Radiation Hazard Report

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