STA REQUEST

By this application and pursuant to Section 25.120 of the Commission's Rules, 47 C.F.R. § 25.120, SES Americom, Inc. ("SES Americom") seeks special temporary authority ("STA") for thirty days beginning on April 4, 2011 to operate three Very Small Aperture Terminal ("VSAT") antennas in order to perform a demonstration for U.S. government customers. The antennas will operate with the AMC-21 spacecraft at 124.9° W.L. in the standard Ku-band and a hub station licensed to SES Americom under call sign E000102, located in Bristow, VA. Grant of the STA will serve the public interest by permitting SES Americom to respond to customer demand and to accommodate the schedules of the U.S. government personnel who will be attending the demonstration.

SES Americom seeks authority to operate the following antenna models during the period of the STA:

- One 1.2 meter antenna (trade name "Hawkeye")
- One .96 meter antenna (trade name "Cheetah")
- One .6 meter antenna (trade name "Panther")

As discussed below, the 1.2 meter and .96 meter antennas have previously been licensed by the Commission, and full technical data regarding them is already on file. The .6 meter antenna is a newer model, and technical information regarding that antenna is attached.

1.2 Meter Antenna: The 1.2 meter antenna complies with the gain patterns specified in Section 25.209 of the Commission's rules and has previously been licensed for ALSAT operation.[1] SES Americom hereby incorporates by reference the technical information

[1] *See* Radio Station Authorization, AVL Technologies, Call Sign E030130, File No. SES-MOD-20080605-00708, granted July 28, 2008 ("E030130 License"), model number AVLTF1200.

regarding the 1.2 meter antenna that is on file with the Commission.[2] As demonstrated in the technical materials attached hereto, in its operation of the 1.2 meter antenna, SES Americom will not exceed the power levels previously authorized.

.96 Meter Antenna: The .96 meter antenna also complies with the gain patterns specified in Section 25.209 of the Commission's rules and has previously been licensed by the Commission for communications with designated spacecraft.[3] SES Americom hereby incorporates by reference the technical information regarding the .96 meter antenna that is on file with the Commission.[4] As demonstrated in the technical materials attached hereto, in its operation of the .96 meter antenna, SES Americom will not exceed the power levels previously authorized.

To SES Americom's knowledge, the .96 meter antenna has not been specifically licensed for operations with AMC-21, a space station that is licensed by Gibraltar to a wholly-owned subsidiary of SES Americom and is on the Commission's Permitted Space Station List.[5] However, in support of its application for the E030130 License, AVL Technologies has already submitted documentation that it has successfully coordinated the operations of this antenna model using capacity on the satellites positioned on either side of AMC-21 at 123° W.L. and 127° W.L.[6] As a result, operators of all the spacecraft within six degrees of AMC-21 at 124.9° W.L. have previously evaluated the antenna's operational characteristics and consented to its use.

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[2] In addition, a specification sheet for the antenna can be accessed at: http://www.globalcoms.com/Hawkeye_III_Lite_1.2M.asp (last checked on March 31, 2011).
[3] *See* E030130 License, model number AVL TF 9066.
[4] In addition, a specification sheet for the antenna can be accessed at: http://www.globalcoms.com/products_vsat_Cheetah.asp (last checked on March 31, 2011).
[5] *See* http://www.fcc.gov/ib/sd/se/permitted.html (last checked on March 31, 2011).
[6] *See* Certifications 1 and 2 submitted with File No. SES-MOD-20080605-00708.

.6 Meter Antenna: To SES Americom's knowledge the .6 meter antenna has not previously been authorized for regular operation by the Commission. Attached hereto in support of the STA request for this antenna are materials demonstrating that the antenna complies with the off-axis EIRP envelope in Section 25.218 of the Commission's rules, as well as a radiation hazard report.[7]

Grant of the requested authority will serve the public interest by enabling SES Americom to perform the demonstration requested by U.S. government customers. Furthermore, grant of SES Americom's STA request will not adversely affect other operators. As noted above, the 1.2 meter and .96 meter antennas have already been licensed by the Commission, and the technical information provided here demonstrates that temporary operation of the .6 meter antenna is consistent with Commission technical requirements.

SES Americom is an experienced space station and earth station operator and will conduct the proposed demonstration consistent with established industry practices. The demonstration will be performed using AMC-21 transponder 18K, which has a center frequency of 14.360 GHz (the range is 14.342-14.378 GHz). Operation of the terminals during the period of the proposed STA will be on a non-harmful interference basis. Thus, in the unlikely event of a complaint of harmful interference, SES Americom will immediately terminate the demonstration.

For the foregoing reasons, SES Americom respectfully requests an STA to permit operation of the three antennas described herein with the AMC-21 spacecraft at 124.9° W.L. and using the hub station E000102.

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[7] In addition, a specification sheet for the antenna can be accessed at: http://www.globalcoms.com/Panther_Ku.asp (last checked on March 31, 2011).

Technical Materials: Power Calculations

Ku-Band	.6m	3M42G7W	
Carrier Bandwidth	3.42	Mhz	ENTER
Max Input EIRP Density	-23.51	dBW/4 kHz	ENTER RF Transmit Power Ku-Band (max = -14)
Antenna Transmit Gain	36.85	dBi	ENTER
Max EIRP Density	13.34	dBW/4 kHz	Enter in IV.E of sheet
Max EIRP/carrier	42.66	dBW	
Power at Flange	4.42	W - from radhaz line 4	ENTER
Total EIRP for all carriers	43.30	dBW	Must be greater than Max EIRP/carrier

Enter in Max EIRP/carrier on RFI Form for Comsearch

Smallest angle of elevation	5.00	degrees	ENTER
Max EIRP density toward horizon	-8.98	dBW/4 kHz	

Ku-Band	.96m	3M42G7W	
Carrier Bandwidth	3.42	Mhz	ENTER
Max Input EIRP Density	-17.6	dBW/4 kHz	ENTER RF Transmit Power Ku-Band (max = -14)
Antenna Transmit Gain	41.20	dBi	ENTER
Max EIRP Density	23.60	dBW/4 kHz	Enter in IV.E of sheet
Max EIRP/carrier	52.92	dBW	
Power at Flange	14.90	W - from radhaz line 4	ENTER
Total EIRP for all carriers	52.93	dBW	Must be greater than Max EIRP/carrier

Enter in Max EIRP/carrier on RFI Form for Comsearch

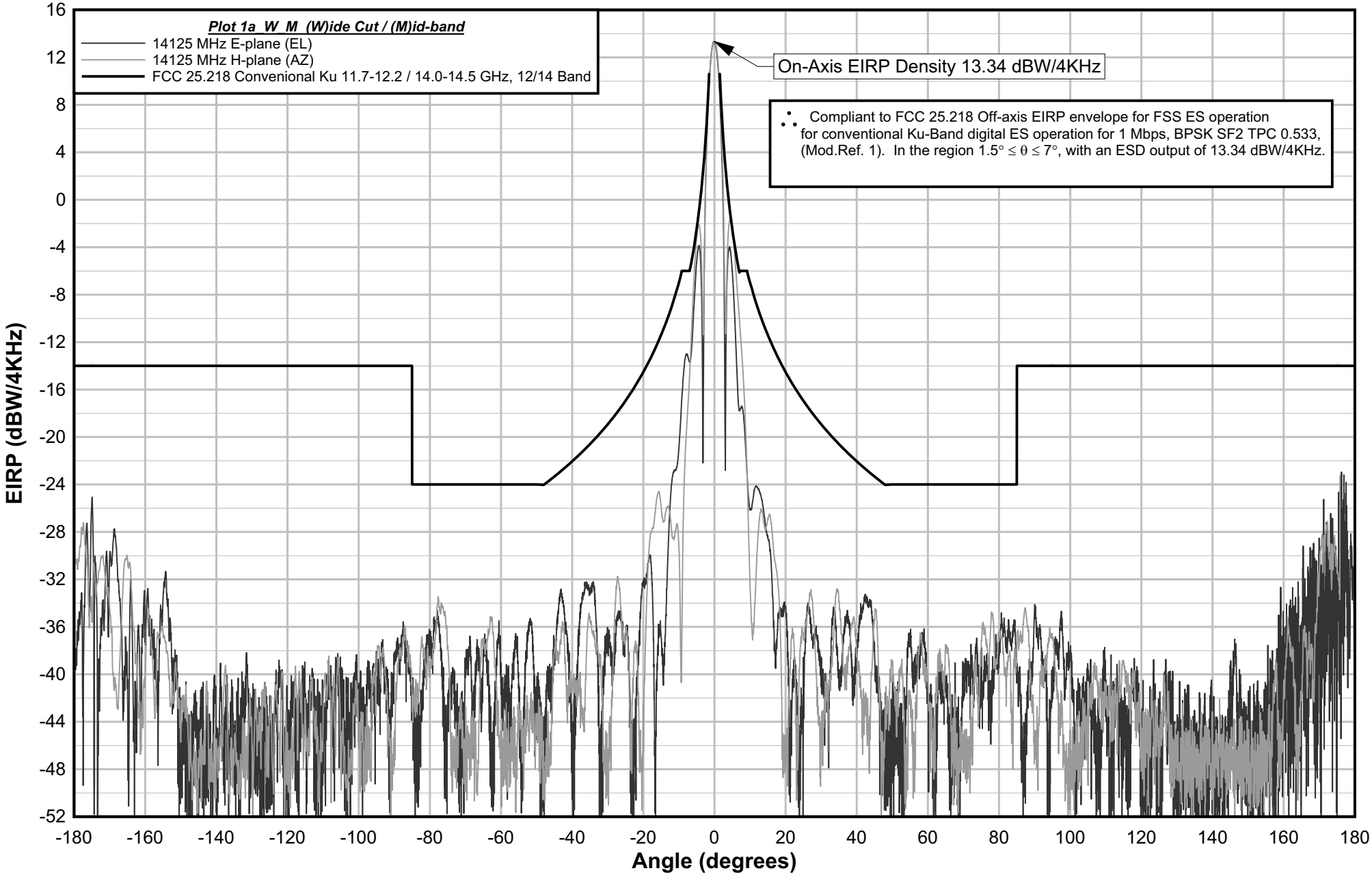
Smallest angle of elevation	15.00	degrees	ENTER
Max EIRP density toward horizon	-15.00	dBW/4 kHz	

Ku-Band	1.2m	3M42G7W	
Carrier Bandwidth	3.42	Mhz	ENTER
Max Input EIRP Density	-16.82	dBW/4 kHz	ENTER RF Transmit Power Ku-Band (max = -14)
Antenna Transmit Gain	43.50	dBi	ENTER
Max EIRP Density	26.68	dBW/4 kHz	Enter in IV.E of sheet
Max EIRP/carrier	56.00	dBW	
Power at Flange	17.80	W - from radhaz line 4	ENTER
Total EIRP for all carriers	56.00	dBW	Must be greater than Max EIRP/carrier

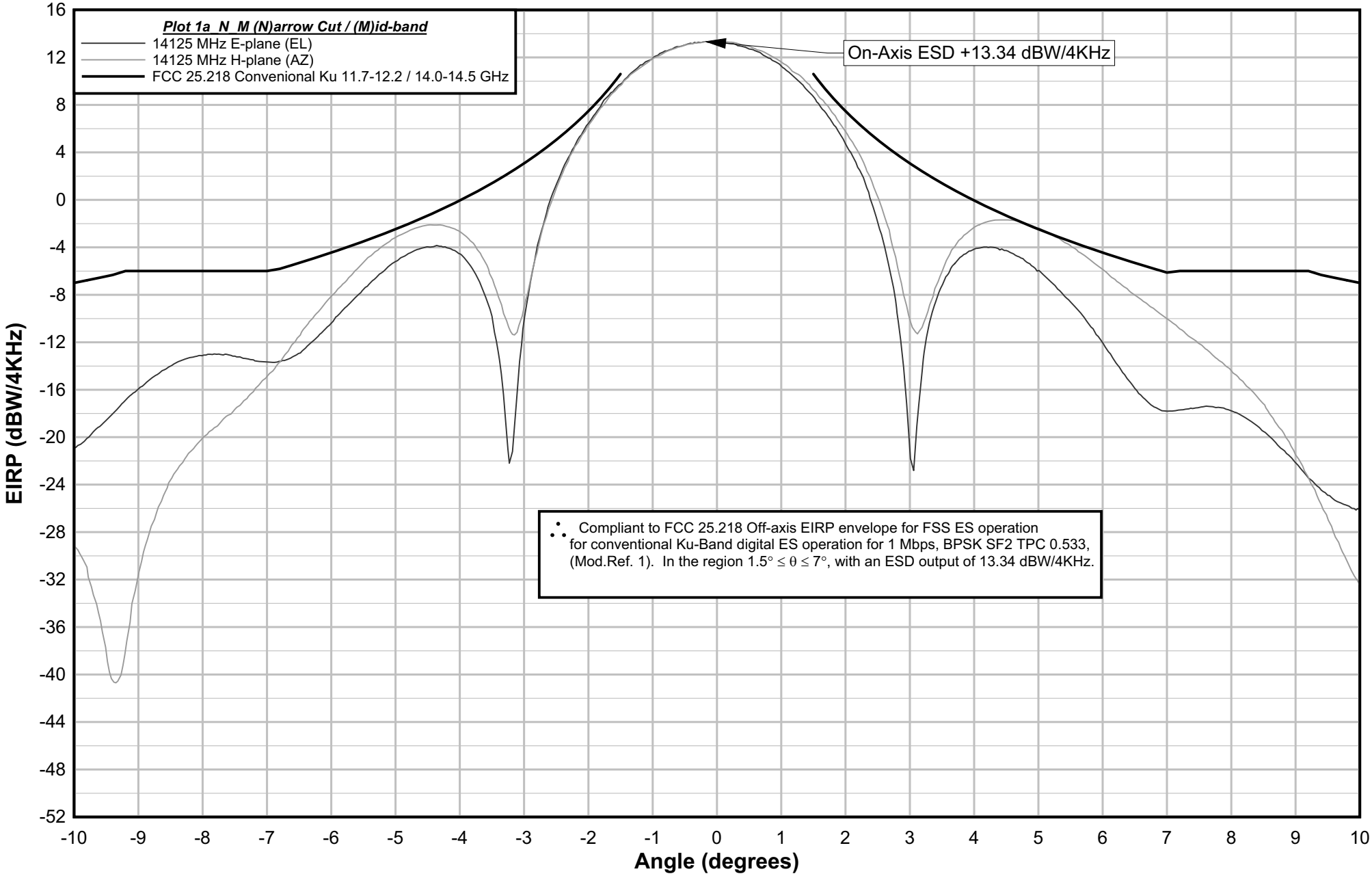
Enter in Max EIRP/carrier on RFI Form for Comsearch

Smallest angle of elevation	10.00	degrees	ENTER
Max EIRP density toward horizon	-9.82	dBW/4 kHz	

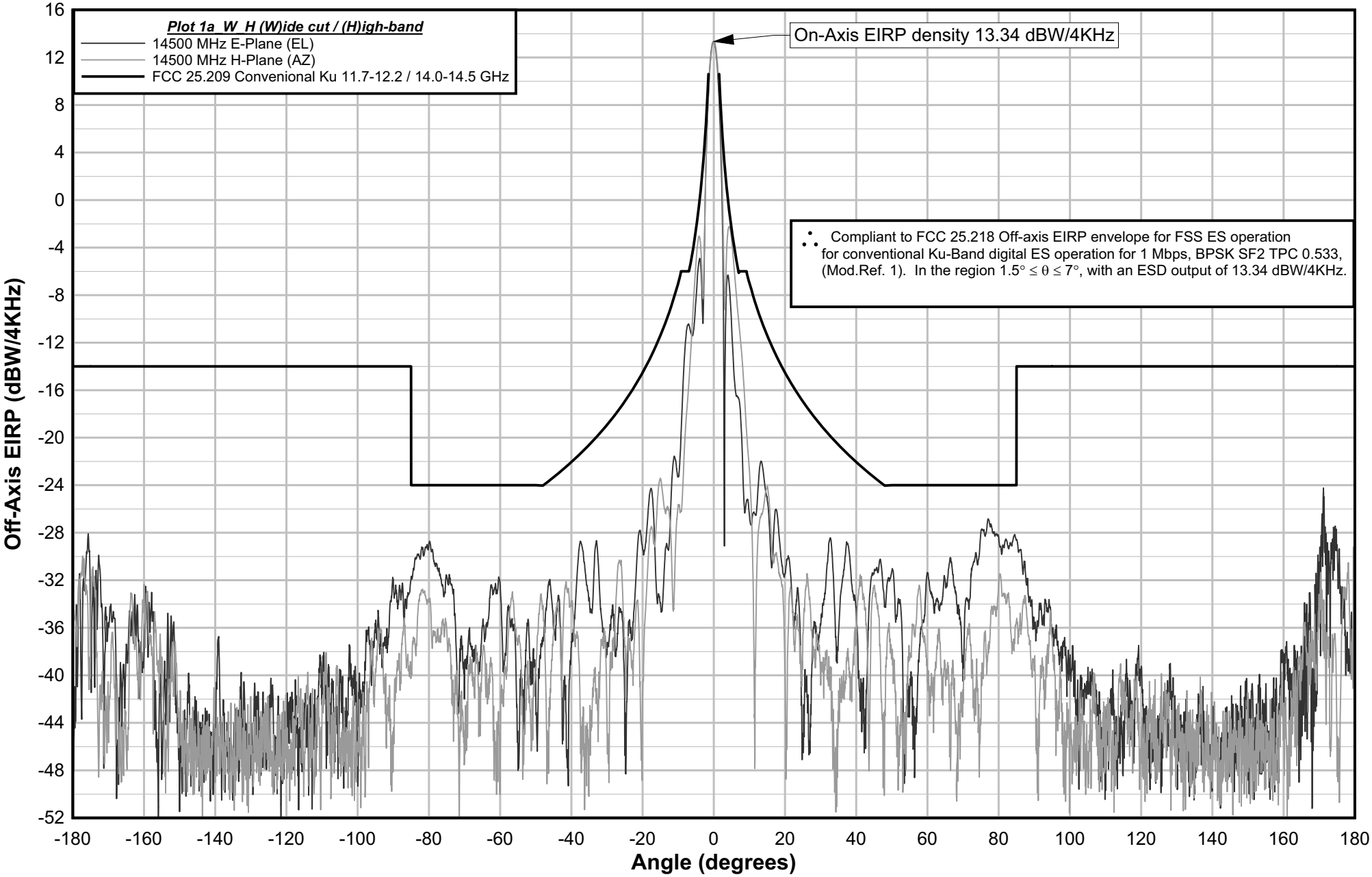
FCC 47 CFR 25.218 Off-Axis ESD Compliance
CONUS
X-Pol. Conf. f = 14.125 GHz



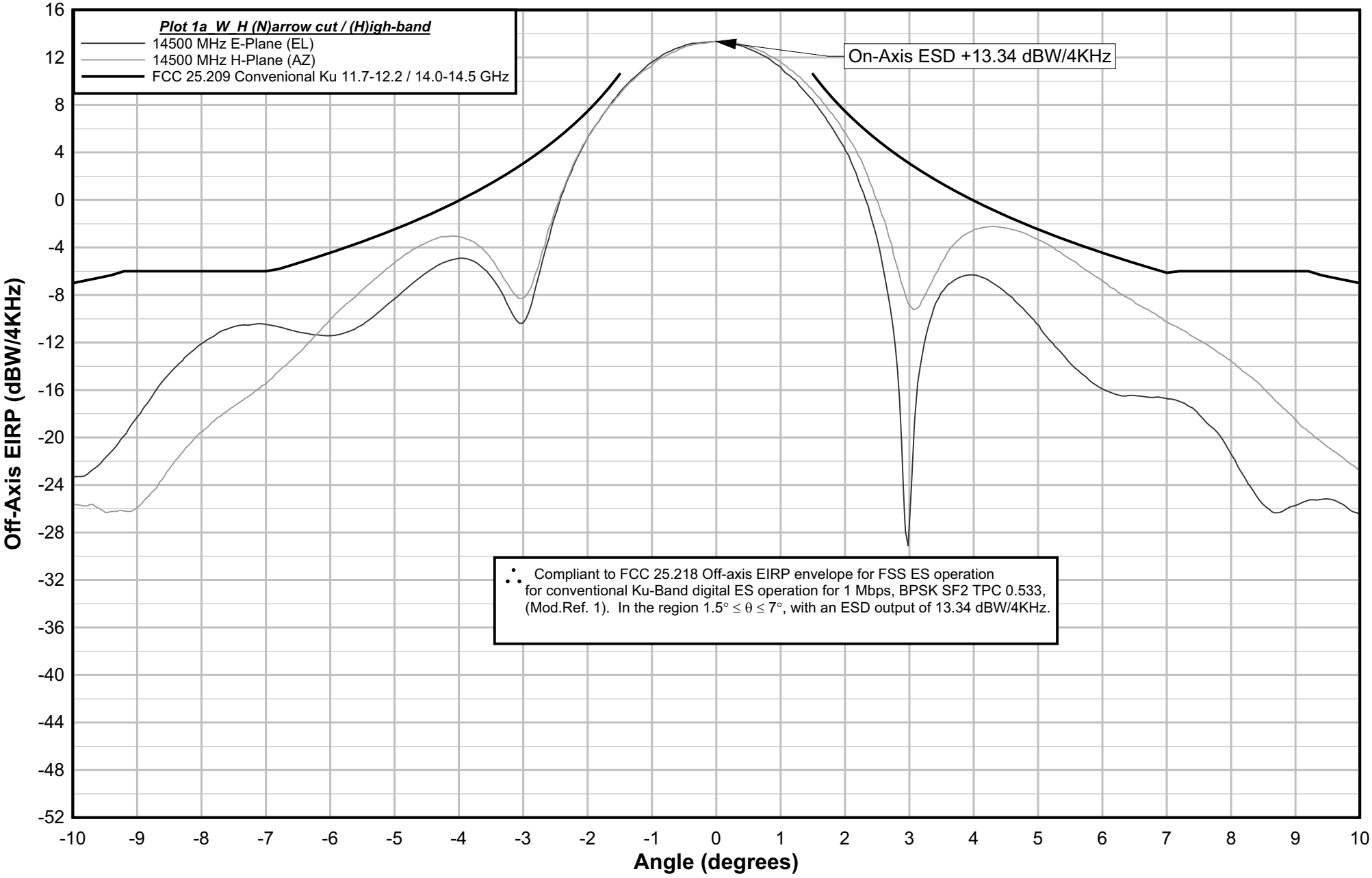
FCC 47 CFR 25.218 Off-Axis ESD Compliance
CONUS
X-Pol. Conf. f = 14.125 GHz



FCC 47 CFR 25.218 Off-Axis ESD Compliance
CONUS
X-Pol. Conf. f = 14.5 GHz



FCC 47 CFR 25.218 Off-Axis ESD Compliance
CONUS
X-Pol. Conf. f = 14.5 GHz



Radiation Hazard Analysis

0.6 Meter Panther
Bristow, Virginia 20136

Introduction

A radiation hazard anaylsis is presented for a 0.6 meter Ku band aperture antenna to be installed in BristowVirginia at the SES WORLD SKIES Washington Mediaport. This Radiation Analysis calculates the non-ionizing radiation levels expected to be emitted from the earth station on a worse cases basis and is performed in accordance with the Federal Communications Commissions Office of Engineering and Technology (OET) Bulletin, No. 65.

Requirements

OET 65 outlines the maximum permissible exposure limits in two cases for operation in this frequency range.

1. The first case is the maximum level that a person may be exposed to in the general population. The exposure limit is defined as a non-ionizing power level equal to 1 milliwatt per centimeter squared averaged over a thirty minute period.
2. The second case is a controlled environment where the maximum permissible exposure limit must not exceed 5 milliwatts per centimeter squared averaged over any six minute period.

Summary

The results indicate that no significant hazard will be presented to the general population and will be fully mitigated in the controlled area by the use of procedures that require the removal of transmit power before accessing the area around the main reflector.

Analysis

This analysis was performed on seven zones with the results shown in Radiation Hazard Zones. The Table labeled Input Values provides the - input data required to perform the analysis. The table labeled OET 65 Calculated Values provides the intermediate calculation used to perform the assessment in accordance with OET 65. The Analysis is performed for each a the each of seven radiation zones as shown in figure 1 – Analysis Zones. These zones are:

1. Point between the feed and the sub-reflector
2. The power at the surface of the antenna
3. The power level between the main reflector and ground
4. The near-field or Fresnel region in which the maxima can be reached before the field starts to diminish with distance
5. The Transition region where power begins to decrease inversely with distance from the antenna
6. The Far Field or Fraunhofer region where power decreases inversely with the square of the distance. This is the point at which the antenna beam is fully collimated
7. The off axis level in the near field. This is defined as the area outside of the main beam removed and at least one antenna diameter removed from the main beam

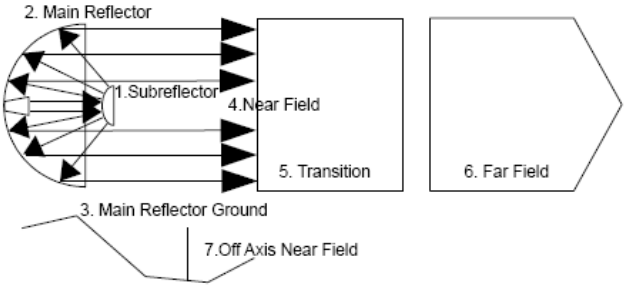


Figure 1 – Analysis Zones

Radiation Hazard Analysis

Operator:	***SES WORLD SKIES***		
Location Designation:	***Washington Mediaport***	*FCC Callsign:*	
County:	***Prince William***	*SES ID:*	*Panther*
Town:	***Bristow***	*STA:*	*Pending*
State/Zip:	***Virginia 20136***		

Input Values	*Value*	*Unit*
D = Aperture Diameter	*0.60*	*Meters*
d = Subreflector Diameter	*0.15*	*Meters*
G = Antenna Gain	*36.85*	*dBi*
FCC Designation	*Ku*	*Band*
F = Frequency	*14.125*	*GHz*
P = Transmitter Power Watts:	*7*	*Watts*
R_{ua} *= closest point to uncontrolled area*	*20*	*meters*
Elevation angle at closest point R_{ua}	*5*	*Degrees*
Height (AGL)	*1.74*	*meters*

Band	*Frequency*
L	*1000-2000*
S	*2000-4000*
C	*4000-8000*
X	*8000-12500*
Ku	*12500-18000*
K	*18000-25500*
Ka	*26500-40000*
O	*40000-50000*
V	*50000-75000*

OET 65 Calculated Values	*Formula*	*Value*	*Unit*
λ= Wavelength	$\frac{c}{F}$	*0.0212*	*meters*
G = Antenna Gain	$10^{(G/10)}$	*4841.723676*	*(W) linear*
η = Apperture Efficiency	$\frac{G\lambda^2/4\pi}{\pi D^2/4}$	*61%*	*percentage*
A = Area of reflector	πR^2	*0.283*	*meters* ^{2}
a = area of subreflector	πr^2	*176.715*	*cm* ^{2}
R_{nf} *= Near-Field Region*	$\frac{D^2}{4\lambda}$	*4.240*	*meters*
		0	*Meters AGL*
R_t *= Transition Region*	$>R_{nf}$	*4.240*	*>meters*
	$<R_{ff}$	*10.177*	*<meters*
R_{ff} *= Far Field Region*	$\frac{0.6D^2}{\lambda}$	*10.177*	*meters*
		1	*Meters AGL*

	Radiation Analysis Zone	*Formula*	*Level*	*Value*	*Exposure Limits*	
					General Public	*Occupational*
					<1mW/cm2	*<5mW/cm2*
1	*Power Subreflector*	$\frac{4P}{a}$	*158.448*	*mW/cm2*	*>FCC MPE See Note 1*	*>FCC MPE See Note 2*
2	*Antenna Surface*	$\frac{4P}{A}$	*9.903*	*mW/cm2*	*>FCC MPE See Note 1*	*>FCC MPE See Note 2*
3	*Main Reflector Ground*	$\frac{P}{A}$	*2.476*	*mW/cm2*	*>FCC MPE See Note 1*	*<FCC MPE*
4	S_{nf} *=Near-Field Power Density*	$\frac{4\eta P}{A}$	*6.079*	*mW/cm2*	*>FCC MPE See Note 1*	*>FCC MPE See Note 2*
5	S_t *= Max Transition Power Density*	$\leq S_{nf}$	*6.079*	*mW/cm2*	*>FCC MPE See Note 1*	*>FCC MPE See Note 2*
6	S_{ff} *= Max Far field Power Density*	$\frac{PG}{4\pi R_{ff}^2}$	*2.604*	*mW/cm2*	*>FCC MPE See Note 3*	*<FCC MPE*
7	*Off Access Level Near Field*	S_{nf} - 20 dB	*0.06079*	*mW/cm2*	*<FCC MPE*	*<FCC MPE*

Notes

1. *The antenna is installed in a controlled location access is restricted to authorized personnel only. The antenna is marked with RF Radiation Hazard signage.*
2. *Inside the controlled area, MPE levels exceed the MPE exposure for occupational levels. The levels will be reduced to safe MPE by removing power to the transmitters when work is performed on or around the antenna. This area can only be accessed by qualified personnel.*
3. *The field develops 1.74 meters above ground level at the minimum elevation angle which is not accessable to the general public.*