FCC OET-65 RF Exposure Study - Satellite Uplink Facility

NBC HD-1B (has no current FCC License)

Antenna Vendor: AVL MVS1200
Antenna Size: 1.2 m.
Amplifier Make/Model: Anacom KU-Band SSPA
Amplifier Max Power: 25 w.

FCC Maximum Permissible Exposure Levels	Source		Units	Notes
Public/uncontrolled area exposure limit	47CFR §1.1310	**1**	mW/cm^2	
Occupational/controlled area exposure limit	47CFR §1.1310	**5**	mW/cm^2	

Input Data				
Antenna Diameter	datasheet	**120.0**	cm	
Antenna surface area	calculated	**11310**	cm^2	
Feed flange diameter	measured	**6.350**	cm	WR-75
Feed flange area	calculated	**32**	cm^2	
Frequency	(entry)	**14125**	MHz	
Wavelength (speed of light = 299,792,458 m/s)	calculated	**2.122**	cm	
Transmit power at flange	datasheet	**25000**	milliwatts	
Antenna gain	datasheet	**43.5**	dBi	
Antenna gain factor	calculated	**22387**		
Height of base of antenna above ground	measured	**4.145**	m	
Height of center of antenna above ground	measured	**4.745**	m	
Minimum Elevation Angle	(entry)	**5**	degrees	
Minimum Elevation Angle	calculated	**0.08727**	radians	

Results calculated using FCC Bulletin OET-65 (Edition 97-01 August 1997)				FCC Maximum Permissible Exposure (MPE) Uncontrolled	Controlled
Maximum power density at antenna surface	Eq. 11 Pg 27	**8.841941283**	mW/cm^2	Potential Hazard	Potential Hazard
Power density at feed flange	Eq. 11 Pg 27	**3157.640386**	mW/cm^2	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	**1696**	cm		
Maximum new-field power density	Eq. 13 Pg 28	**6.274077543**	mW/cm^2	Potential Hazard	Potential Hazard
Aperture efficiency	Eq. 14 Pg 28	**0.709581453**			
Distance to beginning of far-field	Eq. 16 Pg 29	**4070.816218**	cm		
Power density at end of the transition regiion	Eq. 17 Pg 29	**2.614198976**	mW/cm^2	Potential Hazard	Below FCC MPE
Maximum far-field power density	Eq. 18 Pg 29	**2.688**	mW/cm^2	Potential Hazard	Below FCC MPE

Main Beam Far-field region safe exposure distances			
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	**66.73675294**	meters
Height at minimum antenna elevation angle	calculated	**10.56149127**	meters
Horizontal distance	calculated	**66.48279944**	meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	**29.84558323**	meters
Height at minimum antenna elevation angle	calculated	**7.346213974**	meters
Horizontal distance	calculated	**29.73201178**	meters

Off-Axis Near Field/Transition Region safe exposure distances from antenna					
(20 dB reduction in power density at distances greater than one antenna diameter from the main beam center.)	OET-65 Pg 30				
Maximum off-axis near field power density	Eq. 13 Pg 28	**0.0627**	mW/cm^2	Below FCC MPE	Below FCC MPE
Public/uncontrolled exposure off-axis distance	Diam/or Eq 17	**1.2**	meters		
Occupatonal/controlled exposure off-axis distance	Diam/or Eq 17	**1.2**	meters		

Off-Axis Far Field safe exposure distances from the antenna			
(Based on side lobe attenuation required by FCC 25.209(a)(2))			
Angle off main beam axis (1 to 48 degrees)	(entry)	5	degree(s)
Off-axis antenna gain factor	OET-65 Pg 30*	**28**	
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29 **	**40.70816218**	meters

* Gain converted from dBi to linear multiple

** If calculated distance is less than the start of the far field region, the distance to the start of the far field region is shown.