FCC OET-65 RF Exposure Study - Satellite Uplink Facility

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

Antenna Vendor:	AVL 2400K
Antenna Size:	2.4 m.
Amplifier Make/Model:	ETM-400
Amplifier Max Power:	400 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	**240.0**	cm	
Antenna surface area	calculated	**45239**	cm^2	
Feed flange diameter	measured	**6.350**	cm	WR-75
Feed flange area	calculated	**32**	cm^2	
Frequency	(entry)	**14000**	MHz	
Wavelength (speed of light = 299,792,458 m/s)	calculated	**2.141**	cm	
Transmit power at flange	datasheet	**350000**	milliwatts	
Antenna gain	datasheet	**49**	dBi	
Antenna gain factor	calculated	**79433**		
Height of base of antenna above ground	measured	**4.145**	m	
Height of center of antenna above ground	measured	**5.345**	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	**30.94679449**	mW/cm^2	Potential Hazard	Potential Hazard
Power density at feed flange	Eq. 11 Pg 27	**44206.96541**	mW/cm^2	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	**6725**	cm		
Maximum new-field power density	Eq. 13 Pg 28	**19.8279939**	mW/cm^2	Potential Hazard	Potential Hazard
Aperture efficiency	Eq. 14 Pg 28	**0.640712365**			
Distance to beginning of far-field	Eq. 16 Pg 29	**16139.16518**	cm		
Power density at end of the transition regiion	Eq. 17 Pg 29	**8.261664124**	mW/cm^2	Potential Hazard	Potential Hazard
Maximum far-field power density	Eq. 18 Pg 29	**8.494**	mW/cm^2	Potential Hazard	Potential Hazard

Main Beam Far-field region safe exposure distances			
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	**470.3586012**	meters
Height at minimum antenna elevation angle	calculated	**46.33945325**	meters
Horizontal distance	calculated	**468.5687447**	meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	**210.3507612**	meters
Height at minimum antenna elevation angle	calculated	**23.67827683**	meters
Horizontal distance	calculated	**209.5503131**	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	**0.1983**	mW/cm^2	Below FCC MPE	Below FCC MPE
Public/uncontrolled exposure off-axis distance	Diam/or Eq 17	**2.4**	meters		
Occupatonal/controlled exposure off-axis distance	Diam/or Eq 17	**2.4**	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 **	**161.3916518**	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.