FCC OET-65 RF Exposure Study - Satellite Uplink Facility

NBC Digital Ku-band transportable uplink - "WA-06"

Antenna Vendor/Model	AVL 2410K
Antenna Size:	2.4m
Amplifier Make/Model:	MCL MT3400
Power at antenna flange:	500w.

FCC Maximum Permissible Exposure Levels	Source		Units
Public/uncontrolled area exposure limit	47CFR §1.1310	**1**	mW/cm²
Occupational/controlled area exposure limit	47CFR §1.1310	**5**	mW/cm²

Input Data			
Antenna Diameter	datasheet	**240.0**	cm
Antenna surface area	calculated	**45239**	cm²
Feed flange diameter	estimated	**6.350**	cm²
Feed flange area	calculated	**32**	
Frequency	(entry)	**14125**	MHz
Wavelength (speed of light = 299,792,458 m/s)	calculated	**2.122**	cm
Transmit power at flange	Application	**500000**	milliwatts
Antenna gain	datasheet	**49.3**	dBi
Antenna gain factor	calculated	**85114**	
Height of base of antenna above ground	measured	**3.3**	m
Height of center of antenna above ground	measured	**4.5**	m
Minimum Elevation Angle	(entry)	**5**	degrees
Minimum Elevation Angle	calculated	**0.08727**	radians

				FCC Maximum Permissible Exposure (MPE)	
Results calculated using FCC Bulletin OET-65 (Edition 97-01 August 1997)				**Uncontrolled**	**Controlled**
Maximum power density at antenna surface	Eq. 11 Pg 27	**44.21**	mW/cm²	**Potential Hazard**	**Potential Hazard**
Power density at feed flange	Eq. 11 Pg 27	**63152.81**	mW/cm²	**Potential Hazard**	**Potential Hazard**
Extent of near-field	Eq. 12 Pg 27	**6785**	cm		
Maximum near-field power density	Eq. 13 Pg 28	**29.82**	mW/cm²	**Potential Hazard**	**Potential Hazard**
Aperture efficiency	Eq. 14 Pg 28	**0.67**			
Distance to beginning of far-field	Eq. 16 Pg 29	**16283.26**	cm		
Power density at end of the transition region	Eq. 17 Pg 29	**12.42**	mW/cm²	**Potential Hazard**	**Potential Hazard**
Maximum far-field power density	Eq. 18 Pg 29	**12.773**	mW/cm²	**Potential Hazard**	**Potential Hazard**

Main Beam Far-field region safe exposure distances			
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29	**581.94**	meters
Height at minimum antenna elevation angle	calculated	**55.22**	meters
Horizontal distance	calculated	**579.73**	meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	**260.25**	meters
Height at minimum antenna elevation angle	calculated	**27.18**	meters
Horizontal distance	calculated	**259.26**	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	**0.2982**	mW/cm²	**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 **	**162.83**	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 used.