

FCC OET-65 RF Exposure Study - Satellite Uplink Facility
NBC Universal Englewood Cliffs C-Band Uplinks

FCC Maximum Permissible Exposure Levels	Source	Units
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	900.0 cm
Antenna surface area	calculated	636173 cm ²
Sub-reflector diameter	measured	122.000 cm
Sub-reflector area	calculated	11690 cm ²
Feed flange diameter	measured	40.284 cm
Feed flange area	calculated	1275 cm ²
Frequency	(entry)	6175 MHz
Wavelength (speed of light = 299,792,458 m/s)	calculated	4.855 cm
Transmit power at flange	Application	1000000 milliwatts
Antenna gain	datasheet	53.7 dBi
Antenna gain factor	calculated	234423
Height of base of antenna above ground	measured	0.1 m
Height of center of antenna above ground	measured	4.15 m
Minimum Elevation Angle	(entry)	15 degrees
Minimum Elevation Angle	calculated	0.26180 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	6.29 mW/cm ²	Potential Hazard	Potential Hazard
Power density at subreflector	Eq. 11 Pg 27	342.18 mW/cm ²	Potential Hazard	Potential Hazard
Power density at feed flange	Eq. 11 Pg 27	3138.38 mW/cm ²	Potential Hazard	Potential Hazard
Extent of near-field	Eq. 12 Pg 27	41710 cm		
Maximum near-field power density	Eq. 13 Pg 28	4.35 mW/cm ²	Potential Hazard	Below FCC MPE
Aperture efficiency	Eq. 14 Pg 28	0.69		
Distance to beginning of far-field	Eq. 16 Pg 29	100104.25 cm		
Power density at end of the transition region	Eq. 17 Pg 29	1.81 mW/cm ²	Potential Hazard	Below FCC MPE
Maximum far-field power density	Eq. 18 Pg 29	1.862 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	1365.83 meters
Height at minimum antenna elevation angle	calculated	357.65 meters
Horizontal distance	calculated	1319.29 meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	610.82 meters
Height at minimum antenna elevation angle	calculated	162.24 meters
Horizontal distance	calculated	590 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.)				
Maximum off-axis near field power density	OET-65 Pg 30	0.0435 mW/cm ²	Below FCC MPE	Below FCC MPE
Public/uncontrolled exposure off-axis distance	Eq. 13 Pg 28	9 meters		
Occupational/controlled exposure off-axis distance	Diam/or Eq 17	9 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 **	1001.04 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.