FCC OET-65 RF Exposure Study - Satellite Uplink Facility
NBC Burbank 3.7 meter Digital Ku-band uplink

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	**370.0**	cm
Antenna surface area	calculated	**107521**	cm^2
Sub-reflector diameter	measured	**48.260**	cm
Sub-reflector area	calculated	**1829**	cm^2
Feed flange diameter	measured	**17.145**	cm^2
Feed flange area	calculated	**231**	
Frequency	(entry)	**14500**	MHz
Wavelength (speed of light = 299,792,458 m/s)	calculated	**2.068**	cm
Transmit power at flange	Application	**200000**	milliwatts
Antenna gain	datasheet	**52.9**	dBi
Antenna gain factor	calculated	**194984**	
Height of base of antenna above ground	measured	**2.3**	m
Height of center of antenna above ground	measured	**4.3**	m
Minimum Elevation Angle	(entry)	**32**	degrees
Minimum Elevation Angle	calculated	**0.55851**	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	**7.44**	mW/cm^2	**Potential Hazard**	**Potential Hazard**
Power density at subreflector	Eq. 11 Pg 27	**437.35**	mW/cm^2	**Potential Hazard**	**Potential Hazard**
Power density at feed flange	Eq. 11 Pg 27	**3465.17**	mW/cm^2	**Potential Hazard**	**Potential Hazard**
Extent of near-field	Eq. 12 Pg 27	**16554**	cm		
Maximum near-field power density	Eq. 13 Pg 28	**4.59**	mW/cm^2	**Potential Hazard**	**Below FCC MPE**
Aperture efficiency	Eq. 14 Pg 28	**0.62**			
Distance to beginning of far-field	Eq. 16 Pg 29	**39728.48**	cm		
Power density at end of the transition regiion	Eq. 17 Pg 29	**1.91**	mW/cm^2	**Potential Hazard**	**Below FCC MPE**
Maximum far-field power density	Eq. 18 Pg 29	**1.966**	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	**557.07**	meters
Height at minimum antenna elevation angle	calculated	**299.5**	meters
Horizontal distance	calculated	**472.42**	meters
Minimum distance for occupational/controlled exposure	Eq. 18 Pg 29	**249.13**	meters
Height at minimum antenna elevation angle	calculated	**136.32**	meters
Horizontal distance	calculated	**211.27**	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	**0.0459**	mW/cm^2	**Below FCC MPE**	**Below FCC MPE**
Public/uncontrolled exposure off-axis distance	Diam/or Eq 17	**3.7**	meters		
Occupatonal/controlled exposure off-axis distance	Diam/or Eq 17	**3.7**	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)	1	degree(s)
Off-axis antenna gain factor	OET-65 Pg 30*	**1585**	
Minimum distance for public/uncontrolled exposure	Eq. 18 Pg 29 **	**397.28**	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.

Prepared by Doug Lung, NBC Universal, July 27, 2007