

FCC OET-65 RF Exposure Study - Satellite Uplink Facility
WTVJ Digital Ku-band transportable uplink - "SNG-6"

| 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 | 125.0 cm |
| Antenna surface area | calculated | 12272 cm ² |
| Sub-reflector diameter | measured | N/A cm |
| Sub-reflector area | calculated | N/A cm ² |
| Feed flange diameter | estimated | 5.874 cm ² |
| Feed flange area | calculated | 27 |
| Frequency | (entry) | 14125 MHz |
| Wavelength (speed of light = 299,792,458 m/s) | calculated | 2.122 cm |
| Transmit power at flange | Application | 109000 milliwatts |
| Antenna gain | datasheet | 43.4 dBi |
| Antenna gain factor | calculated | 21878 |
| Height of base of antenna above ground | measured | 3.2 m |
| Height of center of antenna above ground | measured | 4.11 m |
| Minimum Elevation Angle | (entry) | 15 degrees |
| Minimum Elevation Angle | calculated | 0.26180 radians |

| | | | FCC Maximum Permissible Exposure (MPE) | |
|---|--------------|-----------------------------|--|------------------|
| | | | Uncontrolled | Controlled |
| Results calculated using FCC Bulletin OET-65 (Edition 97-01 August 1997) | | | | |
| Maximum power density at antenna surface | Eq. 11 Pg 27 | 35.53 mW/cm ² | Potential Hazard | Potential Hazard |
| Power density at subreflector | Eq. 11 Pg 27 | 0 mW/cm ² | N/A | N/A |
| Power density at feed flange | Eq. 11 Pg 27 | 16090.36 mW/cm ² | Potential Hazard | Potential Hazard |
| Extent of near-field | Eq. 12 Pg 27 | 1840 cm | | |
| Maximum near-field power density | Eq. 13 Pg 28 | 22.7 mW/cm ² | Potential Hazard | Potential Hazard |
| Aperture efficiency | Eq. 14 Pg 28 | 0.64 | | |
| Distance to beginning of far-field | Eq. 16 Pg 29 | 4417.12 cm | | |
| Power density at end of the transition region | Eq. 17 Pg 29 | 9.46 mW/cm ² | Potential Hazard | Potential Hazard |
| Maximum far-field power density | Eq. 18 Pg 29 | 9.726 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 | 137.76 meters |
| Height at minimum antenna elevation angle | calculated | 39.77 meters |
| Horizontal distance | calculated | 133.06 meters |
| Minimum distance for occupational/controlled exposure | Eq. 18 Pg 29 | 61.61 meters |
| Height at minimum antenna elevation angle | calculated | 20.06 meters |
| Horizontal distance | calculated | 59.51 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 | 0.2270 mW/cm ² | Below FCC MPE | Below FCC MPE |
| Public/uncontrolled exposure off-axis distance | Diam/or Eq 17 | 1.25 meters | | |
| Occupational/controlled exposure off-axis distance | Diam/or Eq 17 | 1.25 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) | 15 degree(s) | | |
| Off-axis antenna gain factor | OET-65 Pg 30* | 2 | | |
| Minimum distance for public/uncontrolled exposure | Eq. 18 Pg 29 ** | 44.17 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.