

# VIETNAM INTERNATIONAL NETWORK ASSOCIATION LLC.

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## Radiation Hazard Evaluation

This report is for propose satellite antenna for Vietnam International Network Association LLC.  
This antenna is located at 2841 Rogers Dr, Falls Church, Virginia 22042.

### **1 Earth Station Technical Parameters - Input Data**

- 1 Antenna Diameter - Standard Parabola 1.8 meters
- 2  $G$  = Antenna Isotropic Gain 46.8 dBi
- 3  $h$  = Nominal Antenna Efficiency 65 Percent
- 4 Nominal Frequency 14.25 GHz
- 5 Maximum Transmit Power Amplifier Size 10 Watts
- 6 Number of Carriers 1 each
- 7 W/G Loss from Transmitter to Feed 0.5 dB
- 8 Multicarrier Fixed Backoff 3 dB
- 9 Desired Object Clearance Height 2 meters

### **2 Earth Station Technical Parameters - Calculated Data**

- 10  $A$  = Antenna Surface Area 2.54 sq meters
- 10  $A$  Standard Parabolic Reflector 2.544690049 sq meters
- 10B Elliptical Reflector 0.00 sq meters
- 11  $D$  = Effective Antenna Diameter 1.8 meters
- 12 Total Transmit Power 10 Watts
- 13  $P$  = Total Feed Input Power (watts) 4.47 Watts
- 14  $E$  = Maximum E/S EIRP - Calculated 53.30 dBW
- 15  $\lambda$  = Wavelength ( $= c/f$  in m/GHz) 0.0210 m/GHz
- 16  $p$  = Pi 3.14159
- 17  $R_{nf}$  = Near Field Limit ( $D^2/4\lambda$ ) 39 meters 128 feet
- 18  $R_{ff}$  = Far Field Limit ( $R_{ff}=0.6D^2/\lambda$ ) 92 meters 302 feet
- 19  $R_{nf}$  to  $R_{ff}$  = Transition Region 39 to 92 meters 128 to 302 feet

### **3 Power Density at the Antenna Surface**

:

Controlled Environment (less than 5 mW/cm<sup>2</sup> in 6 minutes): SAFE  
Uncontrolled environment (less than 1 mW/cm<sup>2</sup> in 30 minutes): SAFE

### **4 On-Axis Density in the Near Field Region**

Evaluation:

Controlled Environment (less than 5 mW/cm<sup>2</sup> in 6 minutes): SAFE

Uncontrolled environment (less than 1 mW/cm<sup>2</sup> in 30 minutes): SAFE

### **5 On-Axis Power Density in the Transition Region**

Evaluation:

Controlled Environment Safe Operating Distance, meters: **4 meters**

Uncontrolled environment Safe Operating Distance, meters : **18 meters**

### **6 On-Axis Power Density in the Far Field Region**

Evaluation:

Controlled Environment (less than 5 mW/cm<sup>2</sup> in 6 minutes): SAFE

Uncontrolled environment (less than 1 mW/cm<sup>2</sup> in 30 minutes): SAFE

### **7 Off-Axis Power Density Levels at the Far Field Limit and Beyond**

Evaluation:

Considering that satellite antenna beams are aimed skyward, power density in the far field will usually not be a problem except at low look angles. In these cases, off axis gain reduction techniques may be used to further reduce the power density levels.

### **8 Evaluation of Safe Occupancy Area in Front of the Antenna**

Safe distance for the following elevation angles (a):

a - Elevation Angle 40 degree is **2.92 meters**

b - Elevation Angle 50 degree is **2.43 meters**