RF RADIATION HAZARD ANALYSIS

Antenna Diameter (D)	=1.2 Meters 3.937 Feet
Antenna Surface Area (SA)	=1.131 sq meters
Subreflector Diameter (DS)	=N/A (prime focus offset)
Subreflector Surface Area (AS)	=N/A
KU Wavelength at 14.250 GHz (LAMBDA)	=.0211 meters
Power at output of VPC flange	=20.969 dB
Path Loss to OMT (IL)	=.6 dB
Power at OMT Flange (P)	=108.87 watts
Antenna Gain at 14.250 GHz (G)	=43.5 dBi (4 port antenna gain)
Antenna Gain given in Power Ratio (GES)	=2.239E+04
Antenna Aperture Efficiency (N)	=.7233

Region	**Radiation Level**	**Hazard Assessment**
Far Field (Rf) 40.948 m 134.35 ft	11.567 mW/cm sq	Potential Hazard
Near Field (Wf) 17.062m 55.979 ft	27.851 mW/cm sq	Potential Hazard
Transition Region (Rt) equal to or less than Ru<Rt<Rf	27.851 mW/cm sq	Potential Hazard
Between Main Reflector and Subreflector (Ws)	N/A (no subreflector)	
Main Reflector Region (Wm)	19.253 mW/cm sq	Potential Hazard
Power Density Between Reflector and Ground	9.626 mW/cm sq	Potential Hazard
Far Field Off Axis (WF) .	116 mW/cm sq	Meets ANSI Requirements
Near Field Off Axis (WN) .	279 mW/cm sq	Meets ANSI Requirements

Conclusion: Based on the above analysis, harmful areas of Radiation do exist in areas around the antenna and in the path of the antenna toward the satellite that it is pointed at. The Area occupied by the general public will not exceed the ANSI limit of 1 mW cm sq. because the antenna is mounted on top of the truck, which is at least 10 feet above the ground, and safety increases with look angles used by the Satellites in the United States on Domestic Satellite arch.

The areas on the ground and behind the antenna are 100 times less power (20 dB) when at a mininimum of the diaameter of the reflector, this is reflected in the Off Axis figures as seen above (WF) & (WN).

The SNG will be marked with the standard radiation hazard warnings, and on the antenna itself. The warning signs will warn personnel to avoid the area around and in front of the reflector when the transmitter is operating. To ensure compliance with safety limits, the earth station transmitter will be turned off and marked to remain off whenever maintenance and repair personnel are required to work in the areas of potential hazard as defined in the above study. Additionally the earth station personnel will be trained to insure that the antenna path is clear at all times while the transmitter is in operation. The only access to the roof of the truck is a stored ladder, which will only be used when the transmitter is off and is not accessible by the general public.

Note: See Exhibit #Ba for how the above calculations were made.

Exhibit Ba Analysis of Non-Ionizing Radiation

Antenna Diameter, (D)=..... := 1.2 D meters D 3.281. = 3.937 Feet

:= $\frac{DD}{4}$

Antenna Surface Area, (Sa)= ..... Sa π Sa = 1.131 sq meters

:= 0

Subreflector Diameter, (Ds)=..... := $\frac{DsDs}{4}$ Ds cm Ds .3937. = 0 Inch's

:= 14.250

Area of Subreflector, (As)=..... Lambda := As π As = 0 sq cm

P1 := 125 watts

Center Frequency, (Cf)=..... Loss := .6 dB CF GHz

Wavelenght at (Cf), (Lambda)=..... .0211 meters

:= P2 – Loss C-Band=.049 Ku-Band=.0211

Transmit Power at HPA or VPC Flange, (P1)=.. := $10^{\frac{P3}{10}}$ P2 := log()P1 10. P2 = 20.969 dB

Path Loss from HPA or VPC to OMT, (Loss)=..

Gain := 43.5

Pwr in dB P3 P3 = 20.369 OMT

Power at OMT, (P)=..... := $10^{\frac{Gain}{10}}$

:= .7233 P P = 108.87 OMT

Pwr in watts

Antenna Gain at (Cf), (Gain)=..... dBi

Antenna Gain Converted to Power Ratio, (Ges). Ges Ges = $2.239\ 10^{4}$ Ratio

Antenna Aperture Efficiency, (n)=..... n

Far Field (Rf)= := ~~Rf.60 (. D~~ D.) Rf = 40.948 meters Rf 3.281.= 134.35

Feet Lambda

Far Field Pwr Density (Wf)= Wf := $\frac{Ges\ P.}{\sim\sim 4.\pi.(Rf\ Rf.)\sim\sim}$ ..1 Wf = 11.567 mw sq cm

Near Field (Rn)= Rn := $\frac{\sim\sim D\ D.\sim\sim}{4.Lambda}$ Rn = 17.062 meters Rn 3.281. = 55.979 Feet

:= $\frac{}{16.n\ P.}$

Near Field Pwr Density (Wn)= Wn $\pi.(D\ D.)$ ..1 Wn = 27.851 mw sq cm

Transition Region (Rt)= Rt := Wn 1. Rt = 27.851 mw sq cm (Equal to or less then)

Pwr Density at Sub Reflector (Ws)= (N/A No Sub Reflector)

Main Reflector Region Pwr Density (Wm)= $Wm := \frac{2.P}{Sa}$ ..1 Wm = 19.253 mw sq cm

Pwr Density between main reflector and ground (Wg)= $Wg := \frac{P}{Sa}$ ..1 Wg = 9.626 mw sq cm

Far Field Off Axis (WF)= WF := Wf .01. WF = 0.116 mw sq cm

Near Field Off Axis (WN)= WNWn := 01. WN = 0.279 mw sq cm