**RF RADIATION HAZARD ANALYSIS**
**Exhibit #B**

| | | | | |
|---|---|---|---|---|
| Antenna Diameter, (D) = | 1.35 | meters / | 4.42935 | Feet |
| Antenna Surface Area (Sa) = | 1.4314 | sq meters | | |
| Subreflector Diameter (Ds) = | 0.0000 | centimeters | | |
| Ku Wavelength at 14.250 GHz (LAMBDA) = | 0.0211 | meters | | |
| Power output of VPC Flange= | 20.969 | dB | | |
| Path Loss to OMT (IL) = | 0.6 | dB | | |
| Power at OMT, (P) = | 108.87 | Watts | | |
| Antenna Gain at 14.250GHz (G) = | 44.30 | dBi (2 port antenna gain) | | |
| Antenna Gain given in Power Ration, (Ges) = | 2.69E+04 | | | |
| Antenna Aperture Efficiency (N) = | 0.650 | | | |

| Region | | | | | Radition Level | | Hazard Assessment |
|---|---|---|---|---|---|---|---|
| Far Field, (Rf) = | 51.825 | meters / | 170.04 | Feet | 8.682 | mW/cm sq | Potential Hazard |
| Near Field, (Wf) = | 21.594 | meters / | 70.849 | Feet | 19.775 | mW/cm sq | Potential Hazard |
| Transition Region (Rt) Ru<Rt<Rf | | | | | equal to or less than 19.775 | mW/cm sq | Potential Hazard |
| Between Main Reflector and Subreflector (Ws) | | | | | N/A (no subreflector) | | |
| Main Reflector Region (Wm) | | | | | 15.212 | mW/cm sq | Potential Hazard |
| Power Density Between Reflector and Ground | | | | | 7.606 | mW/cm sq | Potential Hazard |
| Far Field Off Axis (WF) | | | | | 0.087 | mW/cm sq | Meets ANSI Requirements |
| Near Field Off Axis (WN) | | | | | 0.198 | mW/cm sq | Potential Hazard |

**Conclusion:** Based on the above analysis, harmful areas of Radiation do exist in the 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 1mW cm sq. because the antenna is mounted on top of the truck, which is at least 8 feet above the ground, and safety increases with look angles used by the Satellites in the United States on Dom. Sat. arch. The areas on the ground and behind the antenna are 100 times less power (20dB) when at a min. of the dia. 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 ensure 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 ladder that is not accessible by the general public.

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

## Exhibit Ba Analysis on Non-Ionizing Radiation

| | | | | | |
|---|---|---|---|---|---|
| Antenna Diameter, (D) = | D: = | 1.35 meters | D*3.281 = | 4.429 | Feet |
| Antenna Surface Area, (Sa) = | Sa: = | $\pi * \frac{D*D}{4}$ | Sa = | 1.431 | sq meters |
| Subreflector Diameter, (Ds) = | Ds: = | 0 cm | Ds*.3937 | 0.000 | Inches |
| Area of Subreflector, (As) = | As: = | $\pi * \frac{Ds*Ds}{4}$ | As= | 0.000 | sq meters |
| Center Frequency, (Cf) = | Cf: = | 14.250 GHz | | | |
| Wavelength at (Cf), (Lambda) = | Lambda = | 0.0211 meters | | | |
| | C-Band = .049 Ku-Band = .0211 | | | | |
| Tansmit Power at HPA or VPC Flange, (P1) = | P1= | 125.00 watts | | | |
| | P2:=log(p1)*10 | | P2= | 20.969 | dB |
| Path Loss from HPA or VPC to OMT, (IL) = | Loss: = | 0.6 | | | |
| | P3:= P2-Loss | | P3= | 20.369 | OMT Pwr in dB |
| | P:= | $10^{\frac{P3}{10}}$ | P= | 108.870 | OMT Pwr in watts |
| Antenna Gain at (Cf), (Gain) = | Gain: = | 44.30 dBi | | | |
| Antenna Gain Converted to Power Ratio (Ges)= | Ges: = | $10^{\frac{Gain}{10}}$ | Ges = | 2.69E+04 | Ratio |
| Antenna Aperture Efficiency, (n) = | n: = | 0.6500 | | | |

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|---|---|---|---|---|---|
| Far Field (Rf) = | Rf= | $\frac{.60 * (D*D)}{Lambda}$ | Rf = | 51.825 | meters |
| | | | Rf*3.281= | 170.037 | feet |
| Far Field Power Density (Wf) = | Wf= | $\frac{Ges*P}{4* \pi * (Rf*Rf)}$ * .1 | Wf = | 8.682 | mw sq cm |
| Near Field (Rn) = | Rn= | $\frac{(D*D)}{4*Lambda}$ | Rn= | 21.594 | meters |
| | | | Rf*3.281= | 70.849 | feet |
| Near Field Power Density (Wn) = | Wn= | $\frac{16*n*P}{\pi * (D*D)}$ * .1 | Wn = | 19.775 | mw sq cm |
| Transition Region (Rt) = | Rt = | Wn*1 | Rt= | 19.775 | mw sq cm (Equal to or less than) |
| Pwr Density at Sub Reflector (Ws) = | Ws= | $\frac{2*P}{As}$ *1000 | Ws = | N/A | |
| Main Reflector Region Pwr Density (Wm) = | Wm= | $\frac{2*P}{Sa}$ *.1 | Wm = | 15.212 | mw sq cm |
| Pwr Density between main reflector and ground (Wg) = | Wg= | $\frac{P}{Sa}$ *.1 | Wg = | 7.606 | mw sq cm |
| Far Field Off Axis (WF) = | WF:= | Wf*.01 | WF = | 0.087 | mw sq cm |
| Near Field Off Axis (WN) = | WN:= | Wn*.01 | WN = | 0.198 | mw sq cm |