RF RADIATION HAZARD ANALYSIS

Exhibit #B

Antenna Diameter, (D) =	1.25	meters /	4.10125 Feet
Antenna Surface Area (Sa) =	1.2272	sq meters	
Subreflector Diameter (Ds) =	0.0000	centimeters	
Ku Wavelength at 14.250 GHz (LAMBDA) =	0.02103807	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) =	43.00	dBi (2 port antenna gain)	
Antenna Gain given in Power Ration, (Ges) =	2.00E+04		
Antenna Aperture Efficiency (N) =	0.650		

Region					Radition Level		Hazard Assessment
Far Field, (Rf) =	44.562	meters /	146.21	Feet	8.705	mW/cm sq	Potential Hazard
Near Field, (Wf) =	18.568	meters /	60.920	Feet	23.066	mW/cm sq	Potential Hazard
Transition Region (Rt) Ru<Rt<Rf					equal to or less than 23.066	mW/cm sq	Potential Hazard
Between Main Reflector and Subreflector (Ws)					N/A (no subreflector)		
Main Reflector Region (Wm)					17.743	mW/cm sq	Potential Hazard
Power Density Between Reflector and Ground					8.872	mW/cm sq	Potential Hazard
Far Field Off Axis (WF)					0.087	mW/cm sq	Meets ANSI Requirements
Near Field Off Axis (WN)					0.231	mW/cm sq	Meets ANSI Requirements

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: =	1.25 meters	D*3.281 =	4.101	Feet
Antenna Surface Area, (Sa) =	Sa: =	$\pi * \frac{D*D}{4}$	Sa =	1.227	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 =	0.0210380671 meters			
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: =	43.00 dBi			
Antenna Gain Converted to Power Ratio (Ges)=	Ges: =	$10^{\frac{Gain}{10}}$	Ges =	2.00E+04	Ratio
Antenna Aperture Efficiency, (n) =	n: =	0.6500			

Far Field (Rf) =	Rf=	$\frac{.60 * (D*D)}{Lambda}$	Rf =	44.562	meters
			Rf*3.281=	146.208	feet
Far Field Power Density (Wf) =	Wf=	$\frac{Ges*P}{4*\pi*(Rf*Rf)}$ * .1	Wf =	8.705	mw sq cm
Near Field (Rn) =	Rn=	$\frac{(D*D)}{4*Lambda}$	Rn=	18.568	meters
			Rf*3.281=	60.920	feet
Near Field Power Density (Wn) =	Wn=	$\frac{16*n*P}{\pi*(D*D)}$ * .1	Wn =	23.066	mw sq cm
Transition Region (Rt) =	Rt =	Wn*1	Rt=	23.066	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 =	17.743	mw sq cm
Pwr Density between main reflector and ground (Wg) =	Wg=	$\frac{P}{Sa}$ *.1	Wg =	8.872	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 =	0.231	mw sq cm