Exhibit D

Analysis of Non-Ionizing Radiation for a Viasat 2.4 m Ka-band Earth Station Antenna System

This report analyzes the non-ionizing radiation levels for a 2.4 m earth station antenna system. The analysis method uses principally the formulae in FCC Office of Engineering Technology Bulletin No. 65 but replaces formula (13) of OET-65 with the updated near field power density formula from Table D.5 of the IEEE C95.3-2021 Standard as requested by FCC/OET staff.

The FCC's Office of Engineering Technology's Bulletin No. 65 specifies that there are two separate tiers of exposure limits that are dependent upon the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The two tiers are General Population / Uncontrolled environment, and an Occupational / Controlled environment.

The applicable exposure limit for the General Population / Uncontrolled environment, *i.e.*, areas that people may enter freely, at this frequency of operation is 1 mW/cm^2 average power density over a 30-minute period.

The applicable exposure limit for the Occupational / Controlled environment, *i.e.*, areas that only authorized / trained personnel have access to, at this frequency of operation is 5 mW/cm^2 average power density over a 6-minute period.

Summary of expected radiation levels for a 2.4 m Ka-band antenna in an Uncontrolled Environment when operating at 30 GHz with a 100 W PA

Region	Maximum Power Density	Hazard Assessment
Far field (R_{ff}) = 405.9 m	0.81 mW/cm^2	Satisfies FCC MPE
Near field (R_{nf}) = 169.1 m	21.71 mW/cm^2	Potential Hazard
Transition region (R_t) (R_t) = $R_{nf} < R_t < R_{ff}$	21.71 mW/cm^2	Potential Hazard
Main Reflector Surface ($S_{surface}$)	6.95 mW/cm^2	Potential Hazard

Although the power density level is greater than 1 mW/cm^2 at the reflector surface, near field, and transition region of the projected RF cylinder, these areas are not accessible by the General Population. The earth station enclosure limits access by the General Population in the area immediately around the antenna and the RF cylinder is well above head height outside the earth station enclosure where the General Population / Uncontrolled Environment is present.

Summary of expected radiation levels for a 2.4 m Ka-band Antenna in a Controlled Environment when operating at 30 GHz with a 100 W PA

Region	Maximum Power Density	Hazard Assessment
Far field (R_{ff}) = 405.9 m	0.81 mW/cm^2	Satisfies FCC MPE
Near field (R_{nf}) = 169.1 m	21.71 mW/cm^2	Potential Hazard
Transition region (R_t) (R_t) = $R_{nf} < R_t < R_{ff}$	21.71 mW/cm^2	Potential Hazard
Main Reflector Surface ($S_{surface}$)	6.95 mW/cm^2	Potential Hazard

Although the power density level is greater than 5 mW/cm^2 at the near field and transition region of the projected RF cylinder, access to the earth station enclosure will be limited to trained personnel and only when the transmitted is not turned on. Additionally, the transition region begins outside the earth station enclosure and is well above head height for Controlled Environments.

The power density level in the area between the feed and the reflector surface is greater than the reflector surface and is assumed to be a potential hazard.

Conclusions

The proposed earth station system will be located in an enclosure that provides for an environment with controlled access and will be serviced by trained personnel. The enclosure has RF Exposure caution signage posted at the entry gate and each side. Only trained personnel will operate the transmitting system during normal operation or testing. No access to the reflector/feed or near field areas will be permitted when the transmitter is turned on and the transition region begins well above head height even when the transmitter is turned on. Based on the above analysis it is concluded that no hazard exists for Occupational staff or the General Population when the system is being operated.

Analysis of 2.4 m antenna for operation at 30 GHz

The analysis and calculations that follow in this report are performed in compliance with the methods described in the OET Bulletin No. 65 except where noted and as directed by FCC staff.

Definition of terms

The terms are used in the formulas here are defined as follows:

$S_{surface}$ = maximum power density at the antenna surface
S_{nf} = maximum near-field power density
S_t = power density in the transition region
S_{ff} = power density (on axis)
R_{nf} = extent of near-field
R_{ff} = distance to the beginning of the far-field
R = distance to point of interest

P_a = 100 W	maximum power amplifier output
L_{fs} = 0.7 dB	loss between power amplifier and antenna feed
OBO = 0 dB	operating PA output back off
P = 85.1 W	power fed to the antenna in Watts
A = 4.9 m^2	physical area of the aperture antenna
G = 165403.3	power gain relative to an isotropic radiator
D_{maj}, D_{min} = 2.6 m x 2.4 m	major, minor axis diameter of reflector
D_{eff} = 2.5	effective diameter of elliptical antenna in meters
F = 30000	frequency in MHz
= 0.01 m	wavelength in meters (~300/F_{MHz})
= 0.27	aperture efficiency

Antenna Surface. The maximum power density directly in front of an antenna (e.g., at the antenna surface) can be approximated by the following equation:

$$S_{surface} = (4 * P) / A \qquad (1.1)$$

$$= (4 * 85.1\ W) / 4.9\ m^2$$

$$= 6.95\ mW/cm^2$$

Near Field Region. In the near-field or Fresnel region, of the main beam, the power density can reach a maximum before it begins to decrease with distance. The extent of the near field can be described by the following equation **(D** and in same units):

$$R_{nf} = D_{eff}^2 / (4 * \lambda) \qquad (1.2)$$
$$= (2.5\ m)^2 / (4 * 0.01\ m)$$
$$= 169.1\ m$$

The magnitude of the on-axis (main beam) power density varies according to location in the near field. The following equation is used at the request of FCC/OET staff in lieu of OET-65 equation 13[1]:

$$S_{nf} = (16 * P) / (\square * \square * D_{eff}^2) \qquad (1.3)$$

$$= (16 * 85.1 \text{ W}) / (\square * 0.27 * (2.5 \text{ m})^2)$$

$$= 21.71 \text{ mW/cm}^2$$

Transition Region. Power density in the transition region decreases inversely with distance from the antenna, while power density in the far field (Fraunhofer region) of the antenna decreases inversely with the ***square*** of the distance. The transition region will then be the region extending from R_{nf} to R_{ff}. If the location of interest falls within this transition region, the on-axis power density can be determined from the following equation:

$$S_t = (S_{nf} * R_{nf}) / R \qquad (1.4)$$

$$= (21.71 \text{ mW/cm}^2 * 169.1 \text{ m}) / R$$

$$= (3.67\text{x } 10^3 \text{ m} * \text{mW/cm}^2) / R$$ where R is the location of interest in meters

Far-Field Region. The power density in the far-field or Fraunhofer region of the antenna pattern decreases inversely as the square of the distance. The distance to the start of the far field can be calculated by the following equation:

$$R_{ff} = (0.6 * D_{eff}^2) / \square \qquad (1.5)$$

$$= (0.6 * (2.5 \text{ m})^2) / 0.01 \text{ m}$$

$$= 405.9 \text{ m}$$

The power density at the start of the far-field region of the radiation pattern can be estimated by the equation:

$$S_{ff} = (P * G) / (4 * \square * R_{ff}^2) \qquad (1.6)$$

$$= (32.4 \text{ W} * 165403.3) / (4 * \square * (405.9 \text{ m})^2)$$

$$= 0.81 \text{ mW/cm}^2$$

[1] Derived from Table D.5 of IEEE Std C95.3-2021