

**Radiation Hazard Study
for
Transportable Satellite Uplink in the KU Band (14 – 14.5 GHz)
KBMT Beaumont, TX**

Study based on the guidelines in FCC OET Bulletin 65 (OET-65)) and data provided by the applicant and the equipment manufacturer.

Antenna Make / Model: Sat-Lite Technologies Peloris 1411

Antenna Type / Size = Circular 1.45 m diameter

Antenna Gain = 44.8 dBi

Maximum Off-Axis (5 Degrees) Gain = 14.53 dBi (per manufacturer specifications)

Aperture Efficiency (η) = 0.645

Power to the antenna 150 W

Limit for Maximum Permissible Exposure (MPE) for KU Band

Limit for Occupational / Controlled Exposure	5.0 mW/cm ²
Limit for General Population / Uncontrolled Exposure	1.0 mW/cm ²

Equipment installation: The applicant has stated the antenna will be mounted on a vehicle with the center of radiation located 4.38 m above ground level. When in operation the main beam of the antenna will be pointed at an angle well above the horizon.

Near Field Calculation

Rnf = 24.97 m - Near field distance

Snf = 23.44 mW/cm² - Potential Hazard (limits 5.0 / 1.0 mW/cm²)

OET 65 specifies that the worst case power density would be reduced by 20 dB at locations at least one antenna diameter (1.45 meters) off-axis from the “main beam” of the antenna. Therefore, the predicted near field off-axis power density is as follows.

Off Axis Snf = 0.234 mW/cm² - No Potential Hazard (limits 5.0 / 1.0 mW/cm²)

Far Field Calculation

Rff = 59.92 m - Start of far field distance

Sff = 10.04 mW/cm² - Potential Hazard (limits 5.0 / 1.0 mW/cm²)

Off Axis Sff = 0.0094 mW/cm² - No Potential Hazard (limits 5.0 / 1.0 mW/cm²)

Transition Region

The radiation in the transition region between the near field distance and the start of the far field is the ratio of the near field distance to the evaluation point times the near field radiation. Therefore, the radiation level will decrease with increasing distance. In this case, since the on-axis radiation is above the MPE limit for both the near field and the start of the far field it will also be above the limit in the transition region. Likewise, since the off-axis radiation is below the MPE limit for both the near field and the start of the far field it will also be below the limit in the transition region.

CONCLUSION: Based on the above analysis it is concluded that harmful levels of radiation will exist in regions in the main axis of the antenna but well below the MPE limit off-axis from the main beam.

At each deployment of this transportable earth station appropriate site control measures will be taken to ensure that the area where radiation is above the permitted limits is not accessible to either workers or the general public. The appropriate measures will always include the posting of warning signs along with other markings, a site assessment to insure the path of the main beam (area

where the radiation would be above the required MPE) will remain clear of both workers and the general public for the duration of the operation and temporary access control measures will be employed as needed to comply with MPE limits. In addition, to ensure compliance with the safety limits, the earth station transmitters will be turned off whenever maintenance and repair personnel are required to work in an area where the radiation level exceeds the level recommended by applicable guidelines.