



FCC RF Hazard Compliance Analysis
 Prepared for
Ship Equip AS
 1.25 Meter Ku-band VSAT Operation

The following analysis shows an assessment of compliance with applicable FCC limits for maximum permissible exposure (MPE) for 1.25 Meter Ku-band very small aperture terminal (VSAT) operated by **Ship Equip AS**.

Operating parameters

Parameter	Value	Unit
Antenna diameter	1.25	Meter
Aperture Efficiency	65	%
Maximum possible antenna input power	8	Watt
Operating Frequency	14~14.5	GHz

Operating condition

The potential exposure in area in the front of antenna is only limited by the trained technical operator. As a standard safety practice, 1) all operators are trained to turn off the TX power before accessing to antenna for maintenance, 2) TX mute zone is configured as a part of installation procedure where the transmit is muted when the antenna points to a direction where potential directly RF radiation exposure can occur.

FCC MPE Limit

Since immediate access to this VSAT is restricted to **Ship Equip AS** trained personnel, MPE limit of 5.0 mW/cm² applies.

Analysis

Note this analysis is based on Bulletin OET 65.

Parameter	Value	FCC MPE compliance
Power density in the antenna surface $S = 4 * P/A$	2.6 mW/cm ²	52% of the MPE
Near-field, on-axis power density in front of the antenna $S = 16\eta P / (\pi D^2)$	1.7 mW/cm ²	34% of the MPE
Potential Exposure Level to the side of the antenna one diameter from main beam	0.017 mW/cm ²	0.34% of the MPE

Table 1 Mathematic calculation of various power densities per Bulletin OET 65



Potential Exposure Level directly in front of the antenna

According to Bulletin OET 65, the applicable formula for power density at antenna surface is $S = 4 * P/A$ where S is power density, P is antenna input power, and A is the surface area of the antenna. With **8W** of maximum input power, the power density at the antenna surface is **2.6 mW/cm²** as shown in Table 1. This power density is equivalent to **52** percent of the FCC occupation MPE limit.

The formula for near-field, on-axis power density in front of the antenna is $S = 16 * \eta * P / (\pi * D^2)$ where “ η ” is the antenna efficiency and D is the antenna diameter. With **8 W** of maximum input power, the near-filed on-axis power density in front of the antenna is **1.7 mW/cm²** as shown in Table 1, which is equivalent to **34** percent of the FCC occupation MPE limit.

Potential Exposure Level to the side of the antenna

The near field power density of the aperture antenna drops rapidly outside the imaginary cylinder of its main beam extending from antenna surface.

According to Bulletin OET 65, the power density at a distance of one antenna diameter (125cm) to the side of the antenna drops at a factor of 100(20dB) lower than the value calculated for the equivalent distance in the main beam. It would be less than **0.017mW/cm²**, which is equivalent to **0.34** percent of the occupational limit.



Conclusion

Based on the result of power density calculation and in addition, consideration of access restriction and standard safety procedures, it is our conclusion that the operation of **Ship Equip's** Ku-band **1.25M** VSAT satisfies the compliance requirement in the FCC regulation.

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