5.1.4 System RF Power Density and Radiation Safety

5.1.4.1 KHDD-1000S/HF Compliance with RF Exposure Limitations

The following outlines the compliance of the KHDD-1000S/HF with OET Bulletin 65, Evaluatiing Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields and FCC OET Bulletin 56, Table 1-A and 1-B, Q&A regarding Biological Effects and Potential Hazards of Radiofrequency Electromagnetic Fields.

Peak Transmitted Power	1,000,000 W
Largest Pulse Width	4.5 µS
Highest Pulse Repetition Frequency *(Using Pulse width listed above)*	333 Hz
Average Power *(P)*	1498 W
Wavelength *(λ)*	8.52 cm
Antenna Reflector Diameter *(D)*	6 m
Antenna Reflector Surface Area *(A)*	10.8 m^2
Antenna Reflector Isotropic Gain	44.1 dBi

Table 5.1.4.1-1: KHDD-1000S/HF Operating Parameters

Given that the parameters in table 5.1.4.1-1 are fixed for this configuration *(worst case)*, the power density is a function of range from the antenna and location with regard to the axis of the main antenna beam. The power density is greatest along the main beam axis, so all calculations are made for this condition which would cover better case scenarios.

Three different methods are used to estimate power density, depending on whether the point of interest is in the near-field region, transition region or far-field region of the antenna beam. In this particular case, we utilize the far-field equation with an on-axis target, I.E. directly in the transmitted beam outside of the 1mW/cm^2 range but within the 5 mW/cm^2 range. This simulates a point of interest in the "*danger zone"* of the KHDD-1000S/HF radar set.

Table 5.1.4.1-2 predicts the on-axis RF power density at both the 5 mW/cm^2 level and 1mW/cm^2 level. Following the table are the equations utilized to predict the RF fields are shown.

Tx Average Power (dBm)	**61.7**	**dBm**	**Antenna Gain**	**44.1**	**dBi**	**RADAR #**	**KHDD-1000S/HF**	
Transmission Loss (dB)	**2**	**dB**	**Start Range**	**0**	**yards**	**EIRP**	**23.99**	**Gigawatts Pulse**
						ERP	**23.99**	**Mwatts Ave**
Power @ Antenna	**59.7**	**dBm**	**Plot Every**	**3**	**Yards**	**Rad Hazard Minimum Distance**		
OET 65, Supplement B (Edition 97-01)			**Controlled Access** – 6 minute average exposure			**5mW/cm^2**	**641.3**	**feet**
Pulsed Radar Calculations			**Uncontrolled Access** – 30 minute average exposure			**1mW/cm^2**	**1434.0**	**feet**

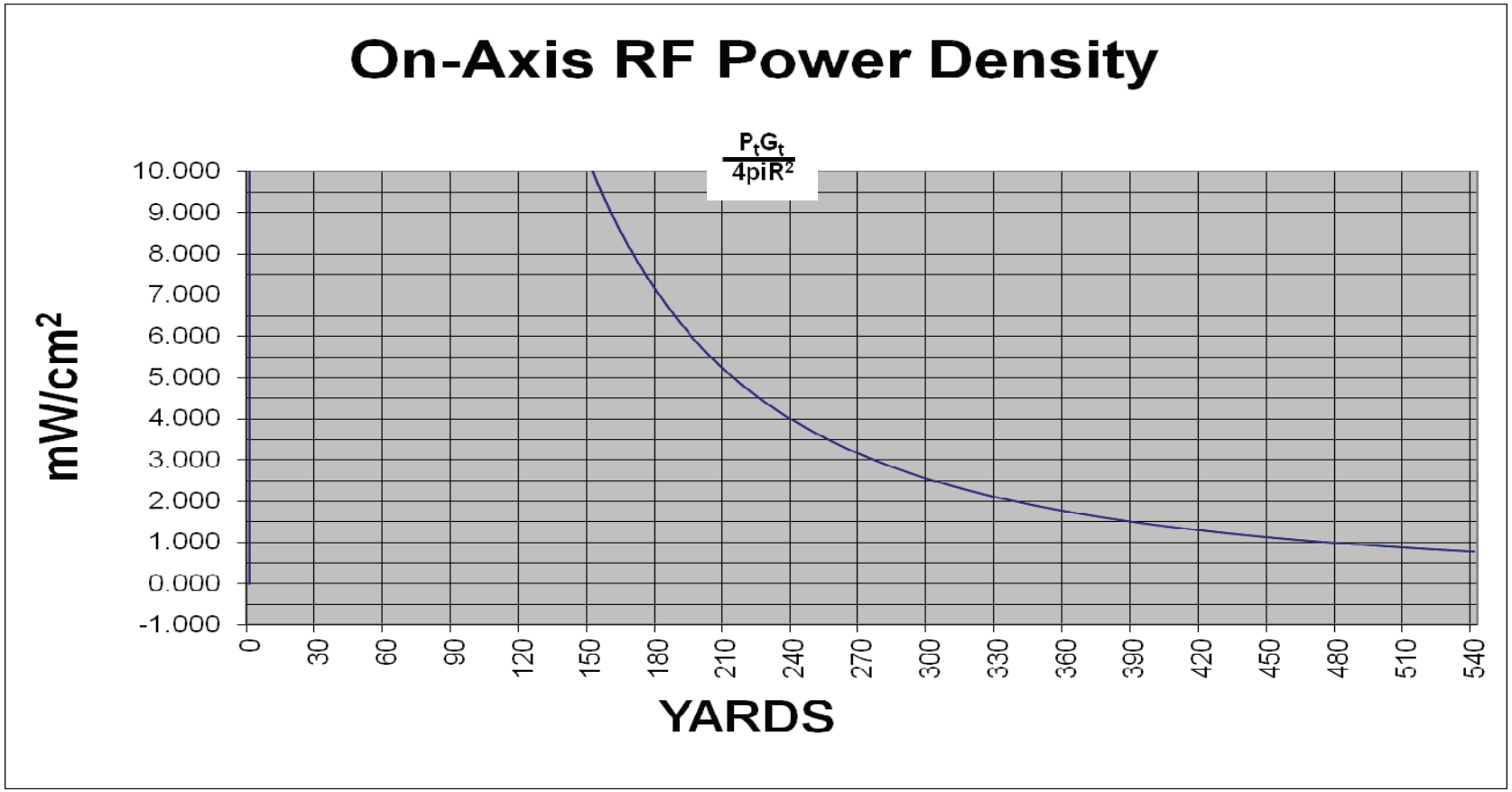

Table 5.1.4.1-2: On Axis RF Power Density chart for compliance with FCC OET Uncontrolled Exposure to Radiofrequency Electromagnetic Fields