R.F Exposure/Safety for OrPT Panel and WGT Transmitters

The typical placement of the Wireless Gateway Terminal is either wall mounted or inside an Orpak Island Fuel Controller. The placement of the Orpak Payment Terminal is inside an Orpak Island Fuel Controller. The typical distance between the two transmitters when placed in an Orpak Island Fuel Controller and the user in the worst case application, is <20 cm .

Calculation of Maximum Permissible Exposure (MPE)

Based on Section 1.1307(b)(1) Requirements

(a) FCC limits at 2440 MHz is: $1\frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) For the 13.56 MHz transmitter (OrPT), the field strength at 3 meters is 51.6 dBµV/m, interpolated to 20 cm is 74.1 dBµV/m.

Converting to Power Density:

$$74.1 dB\mu V/m = 0.066\times10^{-6}\frac{w}{m^2} = 0.0066\times10^{-6}\frac{mW}{cm^2}$$

This is more than 5 orders of magnitude below the 2.4 GHz transmitter and therefore it is negligible.

(b) The power density produced by the 2.4 GHz transmitter is:

$$S = \frac{P_t G_t}{4\pi R^2}$$

P_t- Transmitted Power 5.07 mw (Peak)

G_T- Antenna Gain, 0 dBi = 1 (Numeric)

R- Distance from Transmitter using 20 cm worst case

(c) The peak power density (time averaging) is :

$$S_p = \frac{5.07\times1}{4\pi(20)^2} = 1.0\times10^{-3}\frac{mW}{cm^2}$$

(d) This is below the FCC limit.