Human Exposure to Electromagnetic Fields

This document demonstrates that the Ocean Signal SafeSea S100 Search and Rescue Transponder is in compliance with both US and EU requirements for protection of the general public from exposure to electromagnetic fields.

In the US regulation 47CFR chapter 1.1310[1] specifies that in the band 1500 – 100,000MHz the exposure limit is 1mW/cm^2.

In the EU, Directive 1999/519/EC[2] Annex III; Table 2[3] gives a limit of 10W/m^2 in the frequency range 2-300GHz.

(Note: converting centimetres to metres gives 1mW/cm^2 = 10W/m^2)

From Test Report no. 10/591[4] the Measured EIRP is stated as 460mW

$$\therefore \text{EIRP} = 460\text{mW}$$

$$S = 1\text{mW/cm}^2$$

Distance at which the power density meets the 1mW/cm^2 limit is given by

$$r = \sqrt{(P/(4 \times \pi \times S))}$$

$$r = 6.1\text{cms} \; (= 2.4\text{inches})$$

Therefore the SafeSea S100 meets the requirements for exposure to radiated electromagnetic fields at a worst case distance of 11.5cms from the transmitting antenna in both the USA and Europe.

Note: This calculation is based on the continuous saturated peak output power. In practice the SART will only be illuminated for a small percentage of the time, so the safe distance will be significantly reduced.

David Sheekey — 5th October 2009

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[1] 1.1310 Radiofrequency radiation exposure limits

[2] Council Recommendation on the limitation of exposure of the general public to electromagnetic fields(0Hz to 300GHz)

[3] Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz,unperturbed rms values)

[4] Tested by Public Enterprise Testing Center "Omega"