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FCC Equipment Authorization Branch
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Applicant:	OpenCell Corp
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Subject: Response to questions from Diane Poole of the FCC dated 1/15/04.

Question 1a

Please provide details of the MPE analysis included in the operators manual on page 12 of 140.

Answer 1a

I assume that you are referring to the table showing the safe working distances on page 2 of the ClearControl Operations and Maintenance Manual. This table needs to be updated as follows.

Worker Location	Below Antenna *	Beside Antenna
Four WSP	10.2”	32.3”
Eight WSP	14.3”	45.3”
	* “Below” is defined as a 100 degree cone, 50 degrees each side of the utility pole, with the tip of the cone at the base of the antenna.	

The analysis for the MPE limits is shown below.

Maximum Permissable Exposure (MPE) limits

Exposure Limit Type	PCS	Cell/SMR
Controlled	5 mw/cm^2	2.7 mw/cm^2
General	1 mw/cm^2	0.533 mw/cm^2

ClearControl Effective Radiated Power (EIRP)

The RAN/Antenna at 0 degrees elevation (even with antenna).

Band	RAN RF TX per Tenant	Cable Loss (dB)	Peak Antenna Gain	Max EIRP (dBm)
PCS	41.5	1.2	9.95	50.25 dBm (105.9 watts)
Cell/SMR	38.5	1.0	3.45	40.95dBm (12.45 watts)

Calculation of exposure levels

Exposure levels S = EIRP (in milliwatts) / (4 * pi * D ^2), D is distance measured in cm.

For safe approach. S calculated above must be less than the MPE for the band in question.

Combining the two bands together

Since the two bands, PCS and Cell/SMR, have different exposure limits they need to be combined as follows.

% MPE (PCS) + % MPE (Cell/SMR) = 100% allowable MPE where MPE is Maximum Permissable Exposure)

(EIRPpcs * # PCS Tenants) / (4*pi*D^2*MPEpcs) + (EIRPcellsmr*#CellSMR Tenants)/(4*pi*D^2*MPEcellsmr) = 1

Rearranging the above equation to solve for D

Safe approach distance

D = sqrt(((EIRPpcs*#PCS Tenants) / MPEpcs + (EIRPcellsmr * #Cellsmr Tenants) / MPEcellsmr) / (4*pi))

In performing this calculation it is determined that four PCS Tenants is the worst case. This is due to the higher output power and antenna gain at PCS.

Computed Distance and exposure levels

For the worst case of 4 PCS tenants measured at antenna height

Total EIRP = 105.9 watts * 4 Tenants = 423600 mW

D = sqrt(105900*4)/MPEpcs/(4*pi)

For occupational exposure D = 82.1 cm (32.3 inches)

4 PCS Tenants measured from below the antenna. The antenna has at least 10 dB less gain when approached from below. Therefore,

Total EIRP = 10.6 watts * 4 Tenants = 42360 mW

For occupational exposure D = 26 cm (10.2 inches)

To scale for 8 PCS Tenants, the distances are multiplied by the square root of 2 (1.4), therefore

At antenna height, D = 82.1 * 1.4 = 115 cm (45.3 inches)

Below antenna, D = 26 * 1.4 = 36.4 cm (14.3 inches)

Question 1b

Please include a confirmation that equations were applied in the far field of the antenna.

Answer 1b

The equations used were from page 19 of the OET Bulletin 65. Which predict power density in the far field of an antenna.

Question 1c

Please include details of the maximum power (including all transmitters) that can be transmitted from one antenna.

Answer 1c

The maximum power would be 6 PCS Tenants and two Cell/SMR Tenants. Therefore, the maximum output power is

*6 *105.9 Watts + 2 * 12.45 Watts = 660.3 watts EIRP*

Question 2

Please verify if this is part 25?

Answer 2

This is not Part 25, equipment class "PCB" (PCS Licensed Transmitter) would not be suitable for this equipment as it transmits on Cellular and SMR frequencies, as well as PCS frequencies. All references to Part 25 should be changed to part 24.

When Form 731 was submitted, Part 24E did not show up as one of the menu items under "Rule Part Number". The other Parts (i.e. Parts 22 and 90) needed did show up. As a substitute for Part 24, Part 25 was selected.

The gentlemen that submitted Form 731, corresponded via Email, with a Mr. Ray LaForge on two separate occasions, November 19, 2003 and November 24,2003. At that time he requested all Part 25 references be changed to Part 24.

Respectfully submitted,

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