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Subject: MPE Compliance Statement for Spotcell™ 250Xe/250He CU

Maximum Permissible Exposure (MPE) Compliance Statement for the SpotCell™ 250Xe/250He for Uncontrolled Exposure.

The SpotCell™ 250Xe/250He CU is a Dual Band transceiver in the 800MHz Cellular Band and the 1900MHz PCS band for indoor signal enhancement. This repeater equipment has been tested and the performance characterized in accordance with the MPE requirement of CFR 47, Part 1.1310, Radiofrequency Exposure Limits for fixed installations, pursuant to CFR 47, Part 24.52 of the FCC rules and regulation for PCS equipment and CFR 47, Part 1.1310(b) and CFR 47 Part 22.

Section I – Human Exposure Compliance Statement for Spotcell™ 250Xe/250He CU

Pursuant to CFR 47, Part 1.1310, both the 800MHz cellular band transmitter and the 1900MHz PCS band transmitter of the SpotCell 250Xe/250He CU are subject to the radio frequency radiation requirement of Table 1, in section 1.1310. The power density prediction was done in accordance with the FCC Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields". The new adopted changes to the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields, as specified in document FCC 03-132, released on June 26, 2003 have also been implemented.

The Spotcell™ 250Xe/250He CU repeater operates in both the 1900MHz PCS band and the 800MHz Cellular band simultaneously and is a low power adaptive repeater, having a wide band integral antenna built into the CU module.

The Maximum Permissible Exposure (MPE) limit for the general public is $0.6mW/cm^2$ (f/1500, f = 894MHz) for the Cellular transmitter and a maximum of $1mW/cm^2$ for the PCS 1900MHz band over 30 minutes. For occupationally exposed persons, the MPE limit is $3mW/cm^2$ for the Cellular band and $5mW/cm^2$ for the PCS 1900MHz band, averaged over 6 minutes time, as specified by CFR 47, Part 1.1310, Table 1. Since the Cellular band contributes 50% of the radiated power and the remaining 50% is contributed by the PCS band, only 50% of the cellular power density exposure limit is used for the MPE calculation. Only 50% of the exposure limit for the PCS is used to calculate the MPE statement for PCS band.

The power density at 20cm from the SpotCell™ 250Xe/250He CU is in the Cell band is:

RF input at antenna port = 2dBm = 1.6mW.

Max Gain of Antenna in the Cell band = 0dBi.

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EIRP = 2dBm = 1.6mW.

R = 20cm.

Limit = 50% of 0.6mW/cm^2 = 0.3mW/cm^2

S = Power density = EIRP/($4\pi R^2$) = 1.6mW/(4π*20cm*20cm) = 0.0003183mW/cm^2

Max allowable Antenna Gain = 10log ((0.3mW/cm^2 * 4*π*20cm*20cm)/1.6mW)) = 29.74dBi

Safety Margin = 29.74dBi – 0dBi = 29.74dB.

The power density at 20cm from the SpotCell™ 250Xe/250He CU in the PCS band is:

RF input into the antenna port = 2dBm = 1.6mW

PCS band Max antenna gain = 0dBi

EIRP = 1.6mW = 2dBm

R = 20cm.

Limit at 20cm = 50% of 1mW/cm^2 = 0.5mW/cm^2

S = Power Density = EIRP/($4\pi R^2$) = 1.6mW/(4π*20cm*20cm) = 0.0003183mW/cm^2

Maximum allowable antenna gain = 10log ((0.5mW/cm^2 * 4*π*20cm*20cm)/1.6mW)) = 31.96dBi.

Safety Margin = 31.96dBi – 0dBi= 31.96dB.

Since the Spotcell™ 250Xe/250He CU is deployed where no one will be within a 20cm of approach, the general public is in no danger of being exposed to this limit.

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Label Requirements

The revised section of CFR 47, Part 1.1307 (b), subsection (iv) states that "Labels are not required on any fixed subscriber transceiver antenna if the transmitter is mounted such that persons can **never** be closer than 20cm from any part of the radiating structure and the device can be shown to comply with the MPE limits for the field strength and/or power density at a distance of 20 cm or more." Since the CU is deployed on fixed places where no one comes within the 20cm approach, no RF warning labels are required.

The customer manual has deployment instructions whereby installers are required to install the CU in places where on one will be within a 20cm approach of the radiating elements.

References:

1 – FCC OET Bulletin 65 – Evaluating Compliance with the FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, Edition 97 – 01, August 1997.

2 – FCC 03-132, Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields, Adopted: June 12, 2003, Released: June 26, 2003.

3 – 47 CFR, Part 1.1310, Radiofrequency Exposure Limits.

4 – 47 CFR, Part 1.1307, Actions that may have a significant environmental effect, for which Environmental Assessments (EA) must be prepared, part (b), (iv) – Labeling Requirement.

5 – 47 CFR, Part 24.52, RF hazards.

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Subject: Operational Description of Spotcell 250Xe/250He CU

The SpotCell™ 250Xe/250He CU is a dual band transceiver with no active components for in-building signal enhancement. It receives uplink RF signals in the 1900MHz PCS band and the 800MHz Cell band from wireless devices and conducts them to the DU via RG-6 coax cable. It also receives a leveled constant RF signals from the DU, and transmits them to wireless devices. The SpotCell 250Xe/250He CU consists of a wide band antenna with 0dBi gain and a bias-T circuitry to pass a 24vdc to the DU via RG-6 cable. The out-door unit, DU, is an already certified product, under FCC ID N° 3PYSPOTCELL0014 and does all the signal processing and signal amplification. The CU has a DC jack input for the DC power, which is used to power up the DU (Donor Unit) and RG-6 cable to conduct both DC and RF signals to the DU.

DL Transmit Frequency:

PCS Band:

1930MHz to 1990MHz

Cellular 800MHz Band:

869MHz to 894MHz

UL Receive Frequency

PCS Band:

1850MHz to 1910MHz

Cellular 800MHz Band:

824MHz to 849MHz

Maximum Rated DL Output RF Levels:

Maximum Rated DL output RF power in the 1900MHz PCS Band	Maximum Rated DL Output power in the Cellular 800MHz band
+2dBm	+2dBm

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