Exhibit D

New METs Human Exposure to EMF

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Introduction

In this document human exposure limits to electromagnetic fields from SkyWave new Mobile Earth Terminals are examined.

References

1. FCC, OET Bulletin 65, Edition 97-01, August 1997.
2. FCC, Supplement C to OET Bulletin 65, Edition 01-01, January 2001.
3. ICNIRP, Guidelines For Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (Up to 300 GHz), Health Physics, April 1998.
4. Health Canada, Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz – Safety Code 6 (2009)

Background

The new MET terminals operate using an L-band satellite network running over the Inmarsat fleet of geosynchronous satellites. For operation within the United States, the transmit band (terminal to satellite) is 1626.5-1660.5 MHz. Outside the United States (i.e. Europe), terminals may be capable of transmitting in the band 1668-1675 MHz as well.

Transmission is not continuous but may consist of a mixture of TDMA bursts of duration 62.5 ms, 250 ms, 500 ms and 1000 ms. Transmit duty cycle can be controlled up to a maximum of 80%, within a 5 second frame. The maximum of 80% duty cycle is imposed by the satellite air interface design and cannot be exceeded.

Terminals transmit an RHCP signal through either a quadrifilar helix or patch antenna. The maximum possible EIRP from terminals is 7.0 dBW, or 5W. The maximum possible ERP from terminals is therefore 7.0 – 3.0 + 2.15 = 6.15 dBW, or 4.1 W.

United States

Terminal FCC Classification and Evaluation Criteria

In OET Bulletin 65 and the FCC regulations, 47 CFR § 2.1091 and § 2.1093, a distinction is made between mobile and portable devices. In 47 CFR § 2.1091, a portable device is defined “as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user”, while in 47 CFR § 2.1093, a mobile device is defined “as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby

persons". From these definitions the new METs are mobile, not portable, devices, as they are not normally used within 20 centimeters of a person's body.

Mobile devices operating at 1.5 GHz or above and having ERP of 3W or more are "subject to routine environmental evaluation for RF exposure prior to equipment authorization or use". The new METs are therefore subject to environmental evaluation by the FCC.

FCC Exposure Limits

The FCC OET Bulletin 65 outlines different exposure limits for occupational/controlled exposure and general population/uncontrolled exposure. Both limits will be considered here.

The limits and averaging times are:

Environment	Power Density Limit, mW/cm^2	Averaging Time, minutes
Occupational/Controlled	5	6
General Population/Uncontrolled	1	30

Minimum Safe Distance

The minimum safe operating distance of new METs is computed using the equation

$$S = \frac{D \cdot EIRP}{4\pi R^2}$$ and therefore $$R = \sqrt{\frac{D \cdot EIRP}{4\pi S}}$$ and also $$D = \frac{4\pi R^2 S}{EIRP}$$

In these equations S is the power density, R is the distance and D represents the duty cycle of the transmitter, over the range 0 to 1. For ease of use with the exposure limits, EIRP should be expressed in mW and R in centimetres.

From these equations the following values of interest can be computed:

Item	Environment	Value
MSD, 80% Duty Cycle	Occupational/Controlled	8 cm
MSD, 80% Duty Cycle	General Public/Uncontrolled	18 cm
Max Duty Cycle for 20 cm MSD	Occupational/Controlled	503%
Max Duty Cycle for 20 cm MSD	General Public/Uncontrolled	101%