24th July 2003

Mr. Robert Paxman

Intel Corporation
San Diego CA

Reference FCC ID: E2K24CLNS

Dear Mr. Paxman,

Enclosed are the responses to the questions set by Mr. Timothy Johnson ATCB. I have only answered the questions, which address the areas of the project executed by APREL Laboratories.

Question 2.
Please provide a description of the holder or similar fixtures used to position the test device in the specified test configurations.

The material used for the positioner is low density Styrofoam, which is cut to the specific shape of the device, so that no other loading mechanisms are used other than the phantom filled with tissue simulation fluid during the assessment of the device.

Question 3.
The FCC asks that the composition, ingredients, and amounts for tissue liquid be listed in the report.

As stated in the test report the recipes are the same as those presented in FCC Supplement C page 36, and the composition is the following.

Water = 73%
Salt = 0.04%
Glycol (DGBE) = 26.7%

Question 4.
It appears that the 1 G SAR validation was performed in muscle tissue, while the dipole calibration appears to have been done in head tissue. However the 1 Gram SAR target appears the same given different tissues.

There is no globally approved and accepted methodology for the assessment of body SAR applications, only guidelines. These guidelines are formed using those which are described in IEEE 1528, which in its present form does not have any references to body. Because of this, it has been generally accepted that target values provided for dipole validations, and calibrations can follow those presented in IEEE 1528. The purpose for the dipole validation is to prove functionality of the system by being within +/-10% of the target values. APREL

Laboratories have been developing internal standards for the definition and specification for dipoles, which can be used exclusively for body SAR assessments.

This information will be released for peer review at a latter date, which we hope will form the main technical methods used in the next version of IEEE 1528, and IEC standards. Initial experiments, which have been conducted by APREL Laboratories, using both experimental and numerical techniques have shown that the tuning mechanism and return loss for the dipole (based on the guide lines for a dipole used in head assessments) when placed in proximity to a phantom loaded with body tissue have shown that the return loss is greater than -21dB as specified in IEEE 1528.

Additional measurement exercises have shown that when comparing a validation executed using both head and body tissues the target delta does not exceed the allotted +/-10%. Probes at APREL along with dipoles are calibrated using the accepted target values as documented in IEEE 1528, and any uncertainties are accounted for and included in the uncertainty budget presented within the SAR report.

Question 4.

From information given in the test reports, the following could not be determined:
a) if the distance between the measurement point (tip to boundary distance + offset) at the probe sensor location (geometric center behind the probe tip) and the phantom surface is < 8.0 mm and maintained at a constant distance of +/- 1.0 mm during an area scan to determine peak SAR locations. Please comment.

This information is contained within the report in both the calibration report for the probe, and the SAR measurement report for the specific conservative value assessed. The APREL probe has a diameter of 7mm where the internal diameter for the sensors is less that 4.5mm. The ALIDX-500 SAR system employs a method of maintaining the distance from the centre of the sensor to the phantom surface at 5mm overall (Sd+POsd = 5mm). This is maintained at a constant to within 0.05mm throughout the measurement process, for each measurement point.

b) If probe boundary effect compensation is not used the probe tip should be positioned at least half a probe tip diameter from the phantom surface during area and zoom scans. Please comment.

This definition has been developed so as to eliminate scattering attributable to the boundary effect. During the calibration routine of the probe the boundary effect is taken into account and this is documented within the probe calibration report. Please note that the physical diameter of the sensor orientation is less than 4.5mm, and so the position in which measurements are made and maintained in respect to distance from the boundary are sufficient in eliminating any boundary errors. All uncertainties for boundary effect have been included in the uncertainty budget reported in probe calibration certificate and the SAR report.

c) The first 2 measurements points in a zoom scan closest to the phantom surface, should be within 1cm of the surface. Please comment.

The cube scan/volume method is explained within the SAR report, where the integration derivatives are described. To further clarify this issue, the averaging routing consists of 5x5x7 points. The stating height for this exercise is 5mm from the centre of the sensor, to the phantom surface. The physical volume used for the averaging consist of a 35^3mm cube where the integrals between points in X&Y are 8mm and the Z axis integrals are 5mm.

I trust that the above information should be enough for ATCB to proceed with the grant notice. If you have any further questions please let me know.

Regards,

Stuart Nicol

Director Product Development,
Dosimetric R&D.