CONCERNING GUIDELINES FOR LIMITING EXPOSURE TO TIME-VARYING ELECTRIC, MAGNETIC, AND ELECTROMAGNETIC FIELDS (1 HZ–100 KHZ)

Dear Editors:

THERE ARE a number of errors in the publication of the International Commission on Non-ionising Radiation Protection's guidelines for limiting exposure to time-varying electric, magnetic and electro-magnetic fields (1 Hz–100 kHz) (ICNIRP 2010). These are:

1. In the introduction the notation "mHz" is used when "MHz" was intended;
2. The minimum threshold for the induction of magneto-phosphenes is given as 5 mT at 20 Hz without justification. In one of the few well-controlled quantitative studies of magneto-phosphenes (Lövsund et al. 1980), the limit is given as 10–12 mT for a sinusoidal exposure in the range 20–30 Hz. Recently, Glover et al. (2007) have reported a magneto-phosphene threshold of around 1.5 Ts^{-1} for a single pulse of duration 50 ms, consistent with the earlier values; and
3. In Table 3 containing the Reference Levels for occupational exposure, the magnetic flux density value in the range 1–8 Hz is given as 0.2/f, which is inconsistent with the value of magnetic field strength. By inference the correct value should be $0.2/f^2$.

Given the likely use of the ICNIRP publication by regulators and legislators, for example within the European Union Physical Agents Directive, it is important that corrigenda are published.

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Lövsund P, Oberg PA, Nilsson SE, Reuter T. Magnetophosphenes: a quantitative analysis of thresholds. Med Biol Eng Comput 18:326–334; 1980.

REPLY TO MCROBBIE

Dear Editors:

WE THANK McRobbie for correctly pointing out the misprints. Although those have now been corrected in the online publication, we agree that the publication of a corrigendum would be useful.

Concerning point two of McRobbie's comment, ICNIRP is aware that there is variability in both the published data concerning biological effects of exposure to low frequency electromagnetic fields and in the quality of the available studies. Therefore, an overall evaluation of the scientific evidence as presented through major international and national reviews (IARC 2002; ICNIRP 2003; WHO 2007) provided the basis (justification) of the ICNIRP recommendations.

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QUESTIONS ON ICNIRP GUIDELINES

Dear Editors:

WE HAVE two questions regarding the publication of the *Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz).*

1. In Table 3, the 25 Hz–3 kHz frequency range is divided into two parts: 25 Hz–300 Hz and 300 Hz–3 kHz. However, for the basic restrictions given in Table 2, this frequency range is divided differently: 25 Hz–400 Hz and 400 Hz–3 kHz. There is no explanation for this difference in the text. Is this another misprint or a scientifically-based difference?
2. In Table 2, the basic restrictions are frequency-dependent between 25 Hz and 400 Hz. However, the corresponding reference levels are not frequency-dependent over the same range. Is there an explanation for this?

Erratum–25.11.2010, published on-line after the recommendations, should refer to only one misprint and contains itself a misprint: the first line of the corrected Table 3 should be deleted.

STEPHANE BABO

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REPLY TO BABO

Dear Editors:

1. As explained in the publication, the guidelines are based on two distinct effects, retinal phosphenes, which are also considered a model for weak electric field effects on neuronal networks in the brain, and stimulation of myelinated peripheral and central nerves. Concerning occupational exposure, the basic restrictions for the two effects do intersect at 400 Hz. The reference levels provided in the guidelines combine both effects. Due to differences in dosimetric aspects that need to be considered for these effects, the frequency breakpoints for the reference levels are different from those for the basic restrictions; and
2. The reference levels are derived from the basic restrictions using the frequency-dependent dosimetric relationship between the two quantities. The physical consequence is a different frequency dependence of the reference levels compared to the basic restrictions.

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