Achievements on exposure assessment of EMF-NET MT WORKEN „EMF exposure related risk in the working environment”

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EMF-NET

MT2 - EMF exposure related risk in the working environment

MT2 - WORKEN

The main aims of the MT2-WORKEN

- to provide policy makers with **science-based foundations for EMF regulations or standards concerning occupational safety and health (OSH)** on the national and European levels
- **to integrate European research centres** involved in studies on EMF occupational exposure in order **to exchange experience and good practice**

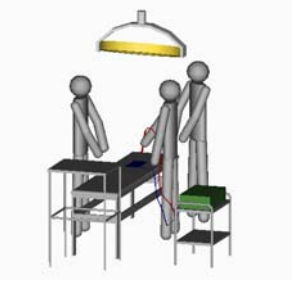
EMF in the workplace

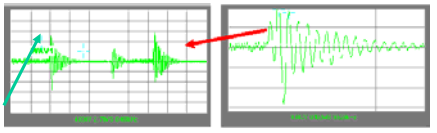
very often:

relatively high intensity
pulsed modulated EMF
hand operated EMF sources

variable:

locations of the EMF source
locations of worker's body
geometry of the source
frequency and level of EMF
repetition time of pulses
duration of pulses
shape of pulses





Health & Safety at Work

Directive 2004/40/EC
of the European Parliament and of the Council of 29 April 2004
on the minimum H & S requirements regarding the exposure of workers to the risks arising from physical agents
(electromagnetic fields)
Published in OJ L 184 of 24 May 2004 (corrected version)

EC directive ⇒ mandatory EMF risk assessment ⇒ sanctions when requirements not fulfilled ⇒ protocols for assessment of particular work places

The need for different approaches than for assessment of EMF emitted by products, which is usually performed under well defined and controlled laboratory conditions

Directive 2004/40/EC

requirements concerning:

- action values / reference values (ICNIRP)
- exposure limit values (basic restrictions)

mandatory risk assessment – assessment, measurements or calculations

- exposure level (E and H)
- dosimetric quantities (J and SAR)

for occupational exposures, where the source is very close to the worker and directly coupled to the body

- local SAR
- induced and contact currents

MT2 Workpackages

- WP10 - Technical co-ordination of whole MT2 activities
- WP11 -Measurement methods for the assessment of workers/humans exposure to EMF
- WP12 - Principles of computer dosimetry for the assessment of risk caused by occupational EMF exposure
- WP2.7 - Monitoring the results of bio-medical studies concerning health implications of EMF exposure with special regard to the technical aspects of the exposure

The MT2-WORKEN focus on:

- monitoring of emerging results of bio-medical studies concerning health implications of EMF exposure
- analysis its implications for the principles and scope of EMF exposure assessment
- the analysis of the results of on-going and completed studies conducted in the area of measurement methods and computer simulations used **for specific EMF exposure assessment for occupational risk evaluation**
- the possibilities of active and passive EMF mitigation
- EMF - medical implants interactions
- carrying out comparative studies supporting the evaluation of particular methods applicability and their comparability

The use of results

The results shall give helpful tools supporting OSH practice, standardisation and legislation.

They are intended for:

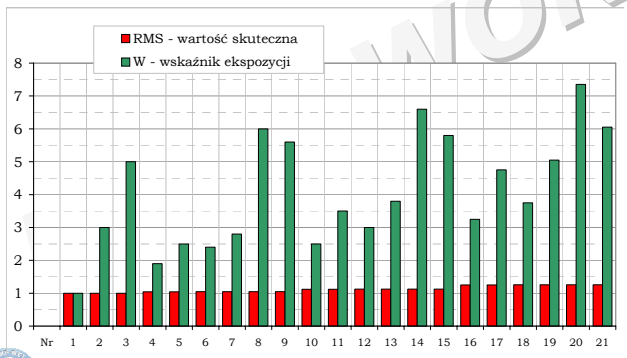
- national and European policy makers
- social partners
- standardisation bodies
- researchers
- other specific target groups involved in EMF exposure prevention (for example EMF sources manufacturer and occupational medicine specialist).

(EMF-NET Consortium partners and any others)

measurements techniques,
coordinated by K. Hansson Mild

- The measurement procedures, for the assessment of risk from occupational exposure to EMF are considered within various frequency ranges – namely low frequency, intermediate frequency and radio-frequency range.
- Comparative studies supporting the evaluation of particular methods applicability and their comparability are in progress.

RMS value / exposure factor *W*
How far we can trust in wide-band RMS measurements?



$$W = \sum_f \frac{B_f}{B_L(f)} \le 1$$

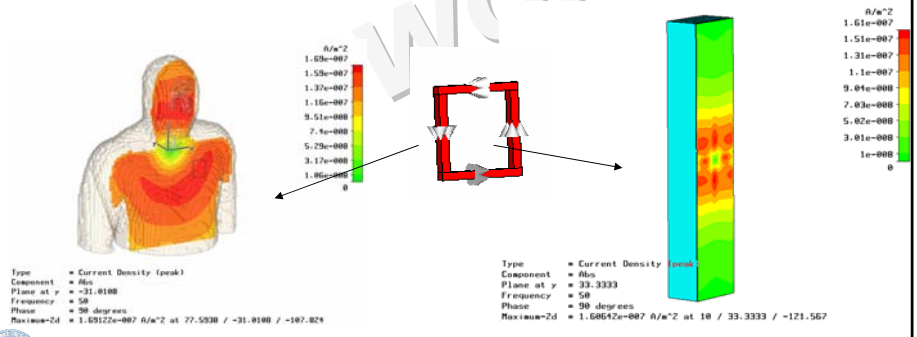
$$RMS = \sqrt{\frac{1}{T}\int_0^T B^2(t)\,\mathrm{d}t}$$

$$RMS = \sqrt{\sum_n \frac{(B_{0n})^2}{2}}$$

various content of 50 Hz, 150 Hz and 250 Hz components

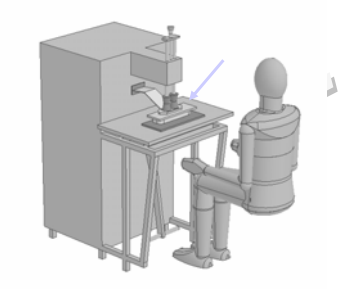
computational dosimetry,
coordinated by P. Rossi

- calculation methods
- and principles of computer dosimetry for the assessment of risk from occupational exposure to EMF



The need of reference and simplified models of EMF sources and realistic worker's body
for the exposure assessment of worker's:

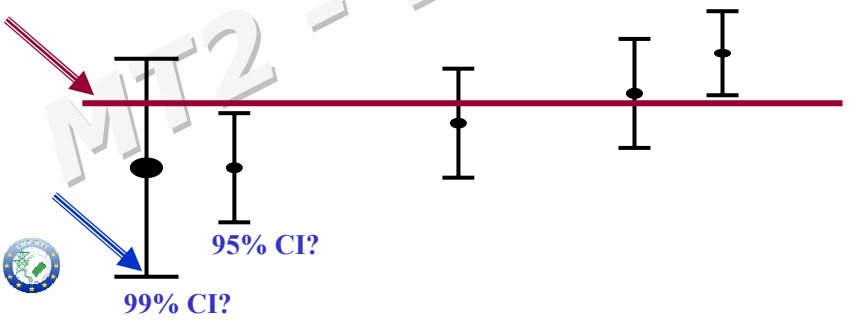
- head
- torso
- hands???



In the different frequency ranges highly exposed groups have been identified and discussed, in order to address standard procedures for measurements and calculations for occupational risk assessment.

"legislation's obligations" for EMF assessment

- exposure assessment protocol:
  - uncertainty of the particular assessment results
- the consequences for decision process
  - when worker's exposure could be take as compliant with the directive provisions or not
  - when employer could be treated as obliged for organizing the exposure reduction



Monitoring of emerging results of bio-medical studies concerning health implications of EMF exposure is coordinated by M. Hietanen.

Its implications for the principles and scope of EMF exposure assessment are continually analyzed.

EMF-NET MT-2 scientific events

- 3-rd EMF Workshop - Session B8: EMF-NET Round Table "Evaluation of occupational exposure to electromagnetic fields - present practices and future perspectives" - organised by MT-2 on 6-th October 2004, Kos, Greece;
- International Workshop on Electromagnetic Fields in Workplace - Session 5: "Problems and perspectives for computational dosimetry of workers exposed to EMF" - co-organised by MT-2 on 7-th September 2005, Warsaw, Poland;
- XXVIIIth General Assembly of International Union of Radio Science (URSI) - Session K06: "Occupational EMF safety and health" - session supported by MT-2, organised on 28-th November 2005, New Delhi, India
- International Welding Workshop, April 2006, Belgium
- ICOH'2006 - Mini Symposium on Occupational EMF - Session supported by MT-2, June 2006, Milan, Italy
- 4-rd EMF Workshop – MRI and Calculations EMF-NET Sessions - organised by MT-2 on October 2006, Crete, Greece;
- Milan workshop, February, 2007

Further plans

- Dissemination of the results
- Publication of the practical guidelines on measurements and calculations for occupational EMF exposure assessment