www.leenakorpinen.fi
The English version is a summary of the more extensive situation report bulletin in Finnish.

New Research on Exposure to Extremely Low-Frequency Magnetic Fields Conducted in Many European Countries

Situation Report Bulletin: 2/2016 – published 28 December 2016

Contents:

No. 01

Editorial

New radiation legislation is currently being prepared in Finland – a draft Goverment Bill and a related request for comments are now available for viewing online on the Ministry of Social Affairs and Health website. The deadline for comments is 16 January 2017. The material is well worth a look, as it will later be supplemented with regulations, such as those concerning extremely low-frequency electromagnetic fields.

In December, an “International Workshop on Non-Ionizing Radiation Protection” (2016 NICT/ICNIRP WS) was organized by ICNIRP in Tokyo, Japan. The main focus of this event was on radio-frequency electromagnetic fields. As regards extremely low-frequency fields, I am not aware of any international events of particular interest having taken place in the fall.

As to my knowledge, guidelines and standards are being produced, both nationally and internationally, in relation to the Directive 2013/35/EU on the “minimum health and safety

requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields)", and the same applies to the Finnish Government Decree on the protection of workers from risks related to electromagnetic fields.

I have once again found some interesting publications for this bulletin. The first papers discuss the exposure of children to magnetic fields, with results, for example, from France and Italy.

In Germany, an interesting approach was adopted to investigate how far a high-voltage power line should be located for it to be accepted and considered safe. The paper suggests that the way information is provided has an impact.

Towards the end of the bulletin, there is a paper on a topic that reaches beyond what we usually discuss here. It deals with the safety and interaction of patients with implantable cardiac defibrillators driving a hybrid vehicle.

The bulletin ends with a paper on occupational exposure, this time focusing on the effects of dietary green tea (polyphenol) supplementation on the health of workers exposed to high-voltage power lines.

Hope you enjoy reading this summary in English!

Leena Korpinen, Professor
Editor-in-chief, Situation Report Bulletin

Leena Korpinen is currently a specializing physician in the field of clinical physiology and nuclear medicine at North Karelia Central Hospital, and an adjunct professor at the University of Tampere.

No. 02

Meta-Analysis of Extremely Low Frequency Electromagnetic Fields and Cancer Risk: a Pooled Analysis of Epidemiologic Studies

Editor-in-chief's comment: The authors performed a meta-analysis of studies investigating the association of extremely low-frequency electromagnetic fields and susceptibility to cancer. The results suggested that there could be a link between exposure and cancer risk, mainly in the United States and where there is residential exposure. Additionally, the authors provided a discussion of the reasons for differences between the studies.

Source:
Zhang Y, Lai J, Ruan G, Chen C, Wang D W. Meta-analysis of extremely low frequency electromagnetic fields and cancer risk: a pooled analysis of epidemiologic studies. Environment International 88 (2016) 36–43.

No. 03

Exposure of Children to Extremely Low Frequency Magnetic Fields in France: Results of the EXPERS Study

Editor-in-chief's comment: The French Ministry of Health and Solidarity has initiated a study on the exposure of the French population to 50-Hz magnetic fields. This paper presented the results of 24-h exposure measurements in children. The proportion of children with a 24-h arithmetic mean of over 0.4 μT was 3.1% (0.8% when children using an alarm clock were excluded).

Source:
Magne I, Souques M, Bureau I, Duburcq A, Remy E, Lambrozo J. Exposure of children to extremely low frequency magnetic fields in France: Results of the EXPERS study. Journal of Exposure Science and Environmental Epidemiology, 9 November 2016, 1–8.

No. 04

Children's Personal Exposure Measurements to Extremely Low Frequency Magnetic Fields in Italy

Editor-in-chief's comment: The researchers measured the exposure of 86 children to extremely low-frequency magnetic fields in Milan, Italy. The median values of over 24-h personal and bedroom measurements were less than 3 μT. The researchers concluded that children's exposure depends not only on the place of residence but also on daily activities and habits.

Source:
Liorni I, Parazzini M, Struchen B, Fiocchi S, Röösli M, Ravazzani P. Children’s Personal Exposure Measurements to Extremely Low Frequency Magnetic Fields in Italy. International Journal of Environmental Research and Public Health 2016, 13, 549.

No. 05

Memory Loss Risk Assessment for Students Near High-Voltage Power Lines – a Case Study

Editor-in-chief's comment: The authors investigated the effects of exposure to electric substations on the memory of male students aged 10 to 12 years in Tehran, Iran. They concluded that exposure to extremely low-frequency magnetic fields may have a negative impact on the working memory of children, but further studies are necessary.

Source:
Ghadamgahi M, Monazzam M R, Hosseini M. Memory loss risk assessment for the students nearby high-voltage power lines – a case study. Environmental Monitoring Assessment (2016) 188: 355.

No. 06

How Far is How Far Enough? Safety Perception and Acceptance of Extra-High-Voltage Power Lines in Germany

Editor-in-chief's comment: The researchers conducted an online survey with 440 participants to investigate the response of laypeople to information on precautionary measures in the context of power lines. The aim was to find out whether this information or the lack of it would affect the distance in which people feel safe or in which they would accept a power line in the vicinity of their homes. The respondents were randomly provided with different introductory tests to the survey and then asked to indicate a "safety distance" and an "acceptance distance" in meters. Information on the share of power lines of the overall exposure at home did not seem to have a statistically significant effect on the safety and acceptance distances requested.

Source:
Wiedemann P M, Boerner F, Claus F. How far is how far enough? Safety perception and acceptance of extra-high-voltage power lines in Germany. Journal of Risk Research 2016.

No. 07

Maternal Exposure to Extremely Low Frequency Magnetic Fields: Association with Time to Pregnancy and Fetal Growth

Editor-in-chief's comment: The researchers tested the hypothesis that maternal exposure to extremely low-frequency magnetic fields is associated with increased time to pregnancy, reduced birthweight, and small for gestational age. The exposure of the mothers included in the study was only slightly higher than that in Finnish residences in general. The hypothesis was not supported.

Source:
Eskelinen T, Roivainen P, Mäkelä P, Keinänen J, Kauhanen O, Saarikoski S, Juutilainen J. Maternal exposure to extremely low frequency magnetic fields: Association with time to pregnancy and foetal growth. Environment International 94 (2016) 620–625

No. 08

Safety and Interaction of Patients with Implantable Cardiac Defibrillators Driving a Hybrid Vehicle

Editor-in-chief's comment: The researchers evaluated the effects of electromagnetic interference from hybrid electric vehicles on 30 patients with a stable implanted cardioverter defibrillator (ICD). The ICDs were not observed to respond to electromagnetic interference during the study. It is safe for patients with an ICD to interact with hybrid electric vehicles.

Source:
Tondato F, Bazzell J, Schwartz L, Mc Donald B W, Fisher R, Anderson S S, Galindo A, Dueck A C, Scott L R. Safety and interaction of patients with implantable cardiac defibrillators driving a hybrid vehicle. International Journal of Cardiology (2016).

No. 09

Effects of Dietary Green Tea Polyphenol Supplementation on the Health of Workers Exposed to High-Voltage Power Lines

Editor-in-chief's comment: The authors investigated the change in oxidative stress after exposure to extremely low-frequency electromagnetic fields and the potential protective effects of green tea polyphenol supplementation. They found that polyphenols may have protective effects against oxidative stress.

Source:
Zhang Y, Zhang D, Zhu B, Zhang H, Sun Y, Sun C. Effects of dietary green tea polyphenol supplementation on the health of workers exposed to high-voltage power lines. Environmental Toxicology and Pharmacology 46 (2016) 183–187.

Editorial staff:
Leena Korpinen, editor-in-chief;
Sonator Oy, editorial assistant; Zento Oy, graphic and technical realization
The Finnish situation report bulletin is funded by Fingrid Oyj.
The next situation report bulletin will be published in summer 2017.
The archive is available at www.leenakorpinen.fi.