

WHO, Geneva
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National Report (Republic of Korea)

1. EMF regulations and standards

The EMF exposure limits in Republic of Korea were established in 2001 (MISP Notification No. 2015-18) and enforced since April 2002. Ministry of Science, ICT & Future Planning (MSIP) is responsible for EMF regulations, except power lines which is regulated by MOTIE (Ministry of Trade, Industry and Energy). Radio Research Agency (RRA) is in charge of the standards. The EMF exposure limits of SAR in Korea are referred to the international standards developed by IEEE (FCC guideline). Until Dec. 2012, only the limit of local SAR for head had been mandated. The SAR limits for workers and for body, limbs and whole-body average were adopted and effective from January 2013. The limits of electromagnetic field level are referred to the international standards developed by ICNIRP in 1998. The new ELF EMF guideline adopted by ICNIRP in 2010 is not adopted yet in Korea.

There are two measurement standards for electromagnetic field strength and SAR (RRA Notifications No. 2014-2, 2014-17). The devices and installations regulated for SAR and electromagnetic field strength are described in the separate notification (MSIP Notification No. 2015-17). The assessment results for the electromagnetic field level shall be reported for the broadcasting stations (aggregated antenna power > 60 W) and the base stations (aggregated antenna power > 30 W or 60 W, depending on the type of the communication system) before putting into service or during the periodic inspection (5-year terms) (Clause 65 of Presidential Decree of Radio Wave Act)

The regulation for EMF rating and labelling was enforced from August 1, 2014 (MSIP Notification No. 2015-16). The operators of radio stations should affix the labels for EMF strength rating in an appropriate place. For portable devices used in direct contact with the user's ear, those who manufacture or import such devices should affix the labels for SAR rating, and/or display the highest SAR values appropriately.

2. Public Concerns and Risk Communications

The public concerns about EMF are still very high in Korea. 400-500 public appeals against the radiation of electro-magnetic energy from base stations have been submitted to government offices and operators in a year. Regarding power lines and substations, about 170 complaints have been filed to KEPCO (Korea Electric Power Corporation). Government offices, operators and KEPCO are actively taking care of such complaints.

EMF web sites for interactive and bilateral communication (www.emf.go.kr, www.emf.or.kr, www.emf60hz.com, home.kepco.co.kr) have been providing EMF related information, including the guidelines for the safe use of home appliances and mobile phones. KEPCO also operates the Public Information Dissemination Center since 2006. From 2004, two kinds of Newsletters, one for EMF measurement standards and the other one for biological effects, exposure limits and policies are published biannually. Every other year, a survey on "perception for EMF exposure and its hazard" for general public or experts is performed. From 2012, the information on the SAR values of each mobile-phone model was opened to the public through the RRA website (www.rra.go.kr).

3. Researches on the biological effects of EMF

Two new projects "A Study on the EMF exposure control in smart society" and "A Study on health effects and protection of EMF" launched in 2013 was merged at this year in the new project with total

2.155 billion KRW funded by MSIP. Under the superintendence of ETRI (Electronics and Telecommunications Research Institute), several universities as well as an academic society (KIEES, Korean Institute of Electromagnetic Engineering and Science) are joined for the project. The title of the project is “A Study on the EMF Exposure Control in Smart Society”. Main research topics of the new project are as follows:

- Evaluation of human exposure level from equipments used near human body such as wearable devices, Development of hold body model (adult male/female) for simulating exposure assessment, EMF measurement in occupational exposure environment, Development of ELF/RF personal dosimeter, Development and maintenance of RF exposure system for in-vivo study, performed by ETRI (Electronics and Telecommunications Research Institute)
- Exposure assessment for Mobi-Kids Study and GERoNiMO Project, performed by ETRI
- Prospective epidemiology research on the relation between mobile-phone use and cerebropathia (or brain nervous disease) of adults, performed by Korea University
- Cohort study on the relation between mobile-phone use and behavioral cognitive development of pregnant women and children, performed by Dankook University
- Assessment of the potential carcinogenic effects of childhood and adolescent exposure to RF from mobile telephones on the central nervous system for Mobi-Kids Study, performed by Dankook University
- *In vivo* study to investigate the effect of RF exposure on Alzheimer’s disease, performed by Ewha Woman’s University
- *In vitro* study to investigate the biological effects of combined RF-EMF exposure, performed by KIRAM (Korea Institute of Radiological & Medical Sciences)
- *In vivo* study to investigate the biological effects of RF(CDMA, RFID, etc.) exposure, performed by Ajou University

The project on ELF EMF, “Research of Pattern Analysis related to Environmental EMF” launched in 2013 with total 1.34 billion KRW funded by MOTIE (Ministry of Trade, Industry and Energy) is ongoing. Ulsan university, KERI(Korea Electro-technology Research Institute) and KIEE(The Korean Institute of Electrical Engineers) are joined for this project. The objective of this project is to perform the epidemiological study for the effect of ELF EMF exposure based on the pattern analysis of electromagnetic field in the vicinity of power lines. Main research topics are as follows:

- Development of estimation methodology for individual exposure to magnetic field generated by transmission lines
- Case-Control study to evaluate relationship between stomach and liver cancer and magnetic field generated by transmission lines
- Retrospective Cohort study to evaluate relationship between stomach and liver cancer and magnetic field generated by transmission lines

A new project in ELF frequency band will be launched at the end of this year. KEPCO (Korea Electric Power Corporation) will fund this project. One of the main research objectives is to investigate worker exposure to 60Hz magnetic field in the working environments and to establish ELF EMF management planning for workers. This project will be carried out for four years. KERI (Korea Electro-technology Research Institute), KESRI(Korea Electrical Engineering & Science Research Institute), Inje University, Hoseo University and Soon Chun Hyang University will be joined for this project.

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