INTERNATIONAL EMF PROJECT
25th International Advisory Committee

ONLINE
29 ~ 30 June, 2020

National Report (Republic of Korea)

1. EMF regulations and standards

The EMF exposure limits in Republic of Korea were established in 2001 (MIST Notification No. 2019-4) and enforced since April 2002. Ministry of Science and ICT (MSIT) is responsible for EMF regulations, except power lines which is regulated by MOTIE (Ministry of Trade, Industry and Energy). National Radio Research Agency (RRA) is in charge of the standards. The EMF exposure limits of SAR in Korea are based on 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 based on 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. 2019-3, 2018-18). The devices and installations regulated for SAR and electromagnetic field strength are described in the separate notification (RRA Notification No. 2019-1). The assessment results for the electromagnetic field level 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 (Clause 65 of Presidential Decree of Radio Wave Act) shall be reported. The regulations for high-power stations (over 500 W) were added on Dec. 12, 2017 (enforcement date: since Dec. 12, 2018), and the regulations for Household Appliances were mandated since Dec. 2016 (the enforcement date for electric blankets is July 2017and that for IH cooker, hobs and hotplates is Jan. 2019). The regulations for 5G mobile phone and base stations were mandated since Jan. 17, 2019.

The regulations for EMF rating and labelling were enforced from August 1, 2014 (MSIT Notification No. 2017-20). 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 head, 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. The 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, more than hundred 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.rra.go.kr/emf2/index.do, www.rra.go.kr/emf, 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, Q&A, videos for education and forum offered by RRA. Especially, from 2012 the information on the SAR values of each mobile-phone model, including the kid's phone and watch phone from April 2015, was opened to the public through this website. RRA also endeavors to provide the correct information on electromagnetic waves and to alleviate the concerns of the general public through interactive communications. Since 2015, RRA has been running the education programs on electromagnetic wave safety and forums to enhance the bilateral risk communication with the public. Currently, we are expanding the target audiences of the education programs and forums, and also developing new contents such as issue reports, videos for EMF experiment, etc.

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.

3. Researches on the biological effects of EMF

RF research project which is titled as “A study on public health and safety in a complex EMF environment” was started last year and will be finished in 2023. The main research activities in 2019 are as follows.

A joint study between Korea and Japan, that is, “International Validation Project of the NTP Study on Carcinogenesis of Mobile-Phone Radio-Frequency Radiation” has been carried out. At June 2020, the standard protocol for the 28-day toxicity study was completed and the studies were started simultaneously in both Korea and Japan with Harlan Sprague Dawley male rats exposed to whole-body RFR at a 900 MHz CDMA signal. For this study, the exactly same RF exposure systems were constructed and installed in each country.

The environmental exposures were measured to evaluate integrative and cumulative exposures based on spatiotemporal EMF characteristics for epidemiological study. In Seoul Metropolitan City, with the population more than 20% of the total population of Korea, large-scale measurements have been performing to collect Tx/Rx power data of mobile phones in voice call mode every two years from 2015. The SAR level of the human brain based on the measurement results is being calculated.

The 28 GHz *in vitro* integrated exposure system has been developed for a 3D culture cell experiment, which is more advantageous to identify a biological effect of direct skin MMW (millimeter-wave) exposures. The combined *in vitro* exposures of MMW and UV (ultraviolet) will also be considered.

Prof. JEONG-KI PACK, Dept. of Radio Science and Engineering, Chungnam National University, jkpack@cnu.ac.kr

Dr. Ki-Hwea Kim, Deputy Director, National Radio Research Agency, MSIT, kihweakim@korea.kr

Dr. HYUNG-DO CHOI, Project Leader, Radio & Satellite Research Division, ETRI, choihd@etri.re.kr

Prof. Jin-Kyu Byun, School of Electrical Engineering, Soongsil University, jkbyun@ssu.ac.kr