Bahrain

Report on EMF Activities
13th International Advisory Committee Meeting
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General Research Activities

A field survey was conducted to measure the level of Radio Frequency (RF) radiation emitted from the mobile phone's base stations to which the public may be exposed in Kingdom of Bahrain. The measured RF radiation levels were compared with the limits set by the International Commission of Non-Ionizing Radiation Protection (ICNIRP), and also with the national limits proposed by the Pollution Control Section of the Public Commission for the Protection of Marine Resources, Environment and Wildlife (PCPMREW) in Bahrain.

The sampling size was about 25% of exiting RF mobile phone's base stations (total of 300). The results show that RF radiation from the mobile phone's base stations are several orders of magnitude below both the limits of ICNIRP and PCPMREW. The highest recorded RF radiation level was in Sanabis town (3400 $\mu W/m^2$), in the GSM900 band. This value represents only 0.074% of the ICNIRP limit and represents only 3.4% of the PCPMREW limit. The average power density for all base station under survey was 577.6 $\mu W/m^2$, which is 0.013% of the ICNIRP limit (7964 times less) and 0.58% of the PCPMREW limit (173 times less). Among the five Governorates in Bahrain, the measured RF radiation had the highest average in the Capital (884 $\mu W/m^2$) and the lowest was in the Central Governorate (384 $\mu W/m^2$).

Furthermore, the measured magnetic field strength (**H**)**,** in A/m, and the electric field strength (**E**), in V/m, from the mobile phone's base stations were compared with the limits set by ICNIRP and were found to be much lower and may be considered as safe. The highest **H** and **E** field value were recorded in Sanabis town, having magnitudes 3 mA/m and 1.133 V/m, respectively.

The Long-term RF radiation measurements (24 hour durations) showed some variations in RF radiation levels over this duration. In Addition, street mapping of the power density indicates that this radiation was shielded by urban structures and dissipated.

In conclusion, the measured RF radiation levels from the mobile phone base stations in the Kingdom of Bahrain are much lower than the limits set by ICNIRP and PCPMREW and not expected to cause health hazards, according to the current knowledge.

Policies and Legislations

In order to control radiation resulting from electromagnetic fields and verify the conformity of equipment and installation sites to the environmental standards to protect human health and environment, a draft resolution on the regulation and control of radiation caused by electromagnetic fields has been prepared.

This resolution contains a series of articles on the requirements and environmental standards for equipments and plants of transmission and reception of mobile phones, repeaters of mobile phones that are installed inside the buildings and devices that interrupt the transmission and reception of mobile phones. It also set exposure limits for radiation intensity doses of electric and magnetic fields.

Public Concern and National Responses

Dr. Paolo Vecchia, the Chairman of ICNIRP, had visited Kingdom of Bahrain in 2005, who had the following comments on Bahraini standard:

1. The standard guarantees safety against established effects, with large margins of safety.
2. It diverges in the approach and in the numerical values of limits from international guidelines
3. Some inconsistencies exist between exposure limits and safety distances.
4. Prohibition of indoor installations could prevent the development of microcells, WI-FI and other technical improvements.
5. Non-optimum coverage may substantially increase exposures due to the handsets.

Dr. Paolo Vecchia had also recommended:

1. To pursue harmonisation of standards within the Arab States and at international level.
2. To improve the internal consistency of the national regulations.
3. To balance possible health risks with other factors (social, environmental, economic, and technological.)
4. To clearly explain and justify the reasons for the choice of limit.
5. To establish an open and correct communication with the public.
6. To monitor the outcome of precautionary measures, communication strategies and further technological developments.

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