

# MOBILE RADIO COMMUNICATION BASE STATIONS AND SAFETY OF THE POPULATION: GENERAL SITUATION IN RUSSIA

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- Base stations for wireless communication have brought EMF sources to the permanent residences of people. A global increase in the level of electromagnetic background has taken place leading to its continuing presence in the environment.
- This situation is new for the mankind. Previously existing sources of radio frequency (RF) fields have not influenced the population in such a constant way.

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- Cellular mobile radio communications have developed rapidly in Russia and are one of the most actively growing sectors of the national economy.
- At present about 40,000 mobile radio communication base stations (BS) are located within the country.
- The highest density of BS occurs in large cities and territories adjoining to them. More BSs are needed in rural and distant territories, as well as for the national digital trunk radio communication network.

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- **Obligatory maximum permissible levels (MPL)** near BS in Russia are contained in the Sanitary-epidemiological norms and regulations SanPiN 2.1.8/2.2.4.1190–03 "Hygienic requirements for installation and operation of terrestrial mobile radio communication equipment". This norm was issued by the Ministry of health of Russia in 2003.
- For BS operating in UHF range (300–3000 MHz), the norm limits the MPL of equivalent plane wave power density to **10  $\mu\text{W}/\text{cm}^2$  under non-occupational exposure conditions.**
- This MPL for public exposure was introduced in 1984 for the first time.

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- Providing electromagnetic safety for the population around BSs is under state control and has a multi-stage character.
  1. Before any BS installation is permitted a calculation of the EMF intensity in the surrounding territory is made.
  2. On the basis of the calculation results the operator obtains the permission for BS installation
  3. After completion of the BS installation EMF intensity measurements are carried out. Measurement results are submitted to the territory authority of **the Federal service who issues permission to allow BS operation.**
  4. Periodic checks are carried out once every 1–3 years.

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- Scientific research on the electromagnetic environment in territories adjoining BSs have been conducted by the Centre for Electromagnetic Safety in 1997–2003. The results were reported at the conference in Moscow in September, 2004.
- Data on electromagnetic fields near 220 BSs have been collected. The average power density in uncontrolled areas was  $1.04 \mu\text{W}/\text{cm}^2$  and a maximum value of  $128.6 \mu\text{W}/\text{cm}^2$ .

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- **The mean power density value in this study satisfied the requirements of the Russian standard.** Though in some cases the fixed power density values exceed the MPL in Russia. The maximum power density value exceeded the MPL by 10 times.
- These results showed that electromagnetic environment near BSs fully complies with the requirements of the ICNIRP recommendations, EU and USA standards.

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- In our opinion, following these measurements on BS installations, special attention should be paid to preventing possible hazardous EMF exposure of the population on the roofs and inside buildings where BS are placed, as high power densities occur in the surroundings.
- It is necessary to introduce obligatory requirements to the power density measurement points taking into account the results of our research and obligatory requirements on the physical access to BS antennas.

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- The problem of electromagnetic safety is also a psychosocial one, and the lack of information provokes conflict situations. So-called situational stress (Yu. Grigoriev) is occurring in the population.
- In many cases BS installations produce a negative response in the population – RNCNIRP receives in average to 2 enquiries per week from different regions of Russia.

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- We consider the following unsettled problems connected with the installation and operation of BSs as the most important ones in Russia:
  - ✓ Cellular communication operators use dependent laboratories when making control measurements
  - ✓ Absence of free access by the population and scientific community to information on the electromagnetic field data for local scientific research
  - ✓ The absence of an information program for the population. Information has been provided by RNCNIRP, but it has received no funds for this.

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- Living and work conditions in a modern city allow **simultaneous EMF exposures from different sources** to most people.
- Our investigation of the electromagnetic environment confirms that people in urban areas are exposed to **multi-frequency sources with complex exposure patterns**.
- **In our opinion, this requires further research to determine the maximum permissible levels of electromagnetic field that taking account actual exposure conditions.**