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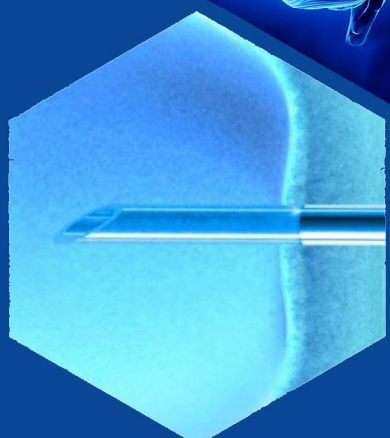
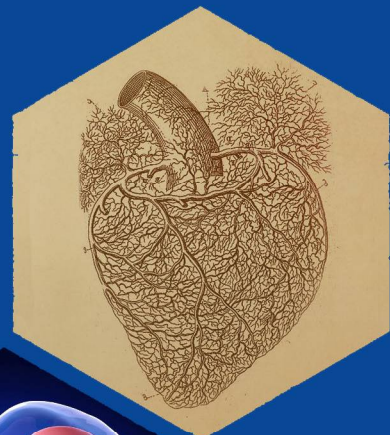
ISSN: 2181-0664

DOI: 10.26739/2181-0664

tadqiqot.uz/uzbek-medikal-journal

UZBEK MEDICAL JOURNAL

Volume 2, Issue 5



2021

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ЎЗБЕК ТИББИЁТ ЖУРНАЛИ УЗБЕКСКИЙ МЕДИЦИНСКИЙ ЖУРНАЛ UZBEK MEDICAL JOURNAL


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HYGIENIC ASSESSMENT OF ELECTROMAGNETIC RADIATION LEVELS OF BASE STATIONS, INSTALLED ON THE ROOFS OF BUILDINGS AND THE TERRITORY OF LAND PLOTS IN TASHKENT

 <http://dx.doi.org/10.26739/2181-0664-2021-5-1>

ABSTRACT

This article is about instrumental measurements of the FR EMR energy flux density. The measurement results were analyzed with the division of the data obtained by the purpose of buildings and the height of the antenna equipment placement, a hygienic assessment of the RF EMR levels created by the equipment of base stations of cellular communications, installed on the roofs of residential and public buildings and adjacent territories of Tashkent is given. A proposal is made on the rational placement of radio engineering facilities.

Keywords: electromagnetic field; electromagnetic safety; base station for mobile communications; protection of public health; sanitary supervision

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ГИГИЕНИЧЕСКАЯ ОЦЕНКА УРОВНЕЙ ЭЛЕКТРОМАГНИТНОГО ИЗЛУЧЕНИЯ БАЗОВЫХ СТАНЦИЙ, УСТАНОВЛЕННЫХ НА КРЫШАХ ЗДАНИЙ И НА ТЕРРИТОРИИ ЗЕМЕЛЬНЫХ УЧАСТКОВ г. ТАШКЕНТА

АННОТАЦИЯ

Авторами были проведены инструментальные измерения плотности потока энергии ЭМИ РЧ, результаты измерений проанализированы с разделением полученных данных по назначениям

зданий и высоте размещения антенного оборудования, дана гигиеническая оценка уровней ЭМИ РЧ, создаваемых оборудованием базовых станций сотовой связи, установленных на крышах жилых, общественных, производственных, административных зданий и территории земельных участков в некоторых районах г. Ташкента и внесено предложение по рациональному размещению радиотехнических объектов.

Ключевые слова: электромагнитное поле; электромагнитная безопасность; базовая станция мобильной связи; охрана здоровья населения; санитарный надзор.

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TOSHKENT SHAHRIDAGI BINOLARNING TOMLARIDA VA YER UCHASTKALARI HUDUDLARIDA O'RNATILGAN TAYANCH STANSIYALARNING ELEKTROMAGNIT NURLANISH DARAJASINI GIGIENIK BAHOLASH

ANNOTATSIYA

Mualliflar RC EMN energiya oqimi zichligini instrumental o'lchovlarini o'tkazdilar, o'lchov natijalari olingan ma'lumotlarning binolarning maqsadi va antenna uskunalari joylashtirish balandligiga bo'linishi bilan tahlil qilindi, turar joylar, jamoat, ishlab chiqarish va ma'muriy binolarning tomlariga va Toshkentga tutash hududlarga o'rnatilgan uyali aloqa tayanch stansiyalari uskunalar yordamida yaratilgan RC EMN darajalariga gigienik baho berildi va radiotexnika ob'ektlarini oqilona joylashtirish taklifi kiritildi.

Kalit so'zlar: elektromagnit maydon; elektromagnit xavfsizlik; uyali aloqa uchun tayanch stantsiya; aholi salomatligini muhofaza qilish; sanitariya nazorati

Relevance:

Numerous studies of electromagnetic radiations (EMR) of different frequency ranges have led to the conclusion that electromagnetic radiations of radiofrequency range (EMR FR) are one of the serious factors of environmental pollution [5, 6], contributing to the violation of health and quality of life of the population [4,7].

Basically, the increase in EMR FR is associated with the accelerating pace of mobile cellular communications and informatization development. The main elements of the system of cellular communication are base stations (BS) and mobile radiophones (MRT), which are sources of electromagnetic radiation in the UHF and microwave range (from 450 MHz to 2600 MHz)

Increasing problems with the provision of electromagnetic safety of the population during the operation of BS occur due to the constant, round-the-clock forced, chronic exposure of all population groups to a complexly organized, modulated electromagnetic field (EMF) [1, 7, 9].

Protection of population from an adverse effect of EMR in conditions of forced ecological risk, during operation of BS, regulation of EMR levels are the basis of organizational and technical measures, which are preferably given to administrative (normative-legal) regulation mechanisms [2, 3, 8]. In this direction, currently relevant is the issue of studying the actual levels of EMRR, radiated by BS and their hygienic assessment, in accordance with current sanitary standards of the Republic of Uzbekistan.

Therefore, the purpose of our research was to study the actual values of EMR levels generated by the antenna equipment of cellular base stations and assess their compliance with the current hygienic standards to ensure the electromagnetic safety of the population.

Materials and methods:

The study of actual levels of electromagnetic radiation coming from cellular base station antennas was conducted by instrumental measurements in places where they were placed on the roofs of buildings of different purposes and on the territory of land plots in some areas of Tashkent. The Mirabad district - 1, Mirzo-Ulugbek - 5, Yashnabad - 5, Yunus-Abad - 1, Shaykhantokhur - 1, Chilanzar - 5, Uch-Tepa - 3, Bektemir - 5, Sergeli - 4, Almazar - 8, Yakkasaray - 2.

The measurement points were selected at the maximums of the directional diagrams of the antennas of cellular communications BS, as well as on the roofs of buildings along the axis of the direction of the main radiation lobes.

Total 600 measurements of EMR levels were made, 40 mobile communication base stations located on the roofs of different purposes were examined: 21 BS - on the roofs of industrial and administrative buildings, 10 BS - on the roofs of social and public buildings, 3 BS - on the roofs of residential buildings and 6 BS - on the land areas of different purposes. Measurements were made at the heights of 1.7 m, 1.0 m and 0.5 m from the roof levels or ground.

The surveyed BS of mobile communications equipment operates in the approximate frequency ranges of 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2600 MHz. As radiating elements of base stations are used cross-polarized sector antennas, mainly by "Huawei" and "Kathrein", combining in one antenna unit at least two bands.

Measurements of energy-flux density (EFD) were carried out by an electromagnetic radiation level meter "PZ-41" (Russia) per the methodology "Electromagnetic fields of radio frequencies. Permissible levels in the workplace and the requirements for monitoring" (GOST 12.1.006-84). The regulation was carried out according to SanPiN 0370-19 "Sanitary norms and rules for location and operation of radio engineering facilities in human settlements" and SanPiN 0269-09 "Sanitary norms and rules for work with sources of electromagnetic fields of radio frequencies".

Results and discussion:

Cellular base stations are radio-electronic facilities that provide cellular cell phone service. One of the elements of BS equipment is antenna-mast structures (AMS), which can be placed both on separately standing poles, located on the land and the roofs of buildings of different purposes, as a rule, the highest ones in the area. Several antenna devices can be installed on one mast, each of which operates in a particular direction and provides a stable connection between subscribers of cellular phones located in the service area of the BS.

The data of studies of the actual levels of EFD IF of base stations, obtained in the course of measurements at their locations, are displayed in the form of tables. As can be seen from Table 1, the results of measuring the levels of EFD IF from the antennas of the BS, located on the roofs of industrial and administrative buildings showed that the highest value of EFD is $14.1 \mu\text{W}/\text{cm}^2$, the lowest - $0.8 \mu\text{W}/\text{cm}^2$. At the same time, values exceeding $10 \mu\text{W}/\text{cm}^2$ and approaching the maximum permissible level ($16.6 \mu\text{W}/\text{cm}^2$) were detected at sites №№ 5, 7, 12, 19, 20, however no exceedances of maximum permissible levels (MPL) were detected at any of the measurement sites.

Table 1.

Levels of EFD IF emitted by BSs installed on the roofs of industrial and administrative buildings.

Object No.	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	Object No.	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)
1	1,2	12	11,3
2	1,3	13	0,9
3	9,8	14	1,2
4	4,5	15	0,9
5	12,7	16	0,8
6	5,7	17	0,9
7	14,1	18	0,7

8	7,1	19	12,4
9	2,3	20	13,5
10	8,5	21	1,3
11	1,2		

Note: EMERF EFD levels, radiated by BS, installed on the roofs of industrial and administrative buildings $16.6 \mu\text{W}/\text{cm}^2$

When measuring the levels of EFD IFR of base stations installed on the roofs of public and social and residential buildings, it was determined that the highest value was $9.8 \text{ mW}/\text{cm}^2$, the lowest - $0.7 \text{ mW}/\text{cm}^2$. According to the results of studies presented in Table 2, values approaching MPLs for public and residential buildings ($10 \mu\text{W}/\text{cm}^2$) were detected at 5 sites: 1, 5, 8, 10, 11. No exceedances of MPLs were detected at any of the measurement sites.

Table 2.

Levels of EFD IFRs emitted by BSs, installed on the roofs of public-social and residential buildings.

Object No.	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	Object No.	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)
1	8,6	8	9,8
2	6,1	9	2,2
3	6,8	10	8,7
4	4,1	11	8,7
5	9,5	12	7,2
6	0,7	13	1,3
7	3,4		

Note: EMRF EFD level radiated by BS, installed on the roofs of industrial and administrative buildings is $10 \mu\text{W}/\text{cm}^2$.

The measurements carried out in the territory of the land plots show that the maximum EFD level did not exceed $1.9 \mu\text{W}/\text{cm}^2$, which is due, in particular, to the considerable height of the support for the antenna equipment suspension of the BS relative to the ground level.

Table 3.

EMR levels, radiated by the BS, installed on the territory of land plots of different purposes

Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	MPL EFD ($\mu\text{W}/\text{cm}^2$)	Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	MPL EFD ($\mu\text{W}/\text{cm}^2$)
1	0,9	16,6	4	0,3	16,6
2	1,9	16,6	5	0,5	16,6
3	0,7	16,6	6	0,3	10

Based on the data obtained, a comparison of EMR SPE levels depending on the height of the antenna equipment of base stations relative to the roofs of buildings was carried out.

Table 4.

EMR SPE levels, radiated by BS, installed on the roofs of industrial and administrative buildings (hanging height of the BS antennas is less than 10 meters)

Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)
1	9,8	6	14,1
2	4,5	7	7,1
3	12,7	8	8,5
4	5,7	9	13,5
5	12,4	10	11,3

Note: EMR IFR, radiated by the BS, installed on the roofs of industrial and administrative buildings $16.6 \mu\text{W}/\text{cm}^2$

The results of measuring the levels of EFD IFR on the roofs of industrial and office buildings with the height of the BS antennae hanger less than 10 m (Table 4) showed that the lowest level of EFD was recorded on the object № 2 and was $4,5 \text{ mkW}/\text{cm}^2$. The levels of EFD exceeding $10 \text{ mkW}/\text{cm}^2$ and approaching the MPL were found at 5 measurement objects.

Table 5.

EFD levels, emitted by BS, placed on the roofs of industrial and administrative buildings (hanging height of BS antennas is more than 10 m.)

Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)
1	1,2	7	1,3
2	1,3	8	0,9
3	2,3	9	0,8
4	1,2	10	0,9
5	0,9	11	0,7
6	1,2		

Note: EMR IFR, radiated by the BS, installed on the roofs of industrial and administrative buildings $16.6 \mu\text{W}/\text{cm}^2$

As can be seen from Table 5 of the measurements results of EMR IFR levels of base stations installed on the roofs of industrial and administrative buildings, the highest level of IFR is $2.3 \mu\text{W}/\text{cm}^2$, the lowest level is $0.7 \mu\text{W}/\text{cm}^2$. No exceedances of MPE ($16.6 \mu\text{W}/\text{cm}^2$) were detected at any site.

Table 6.

Levels of EMR IFRs, radiated by BS, installed on the roofs of public and social and residential buildings (the height of BS antennas suspension is less than 10 m.)

Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)
1	8,6	6	9,8
2	6,1	7	8,7
3	6,8	8	8,7
4	4,1	9	7,2
5	9,5		

Note: MPE IFR EMRF emitted by BS, installed on the roofs of industrial and administrative buildings $10 \mu\text{W}/\text{cm}^2$

The results of EMR IFR RF measurements for the roofs of residential and public buildings with a hanger height of the antennas BS less than 10 m show that the highest value of IFR is $9.8 \text{ mkW}/\text{cm}^2$, the lowest figure is $4.1 \text{ mkW}/\text{cm}^2$. No exceedances of the MPE were detected at any of the measurement sites.

Table 7.

EMR levels radiated by BS, installed on the roofs of public and residential buildings (antennas more than 10 m high)

Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)	Object №	Maximum EFD value ($\mu\text{W}/\text{cm}^2$)
1	0,7	3	2,2
2	3,4	4	1,3

Note: MPE EFD of EMIRF radiated by BS, installed on the roofs of industrial and administrative buildings is $10 \mu\text{W}/\text{cm}^2$

For the roofs of residential and public buildings with a height of the sector antennas over 10 m, the highest EFD is $3.4 \text{ mW}/\text{cm}^2$, the lowest index is $0.7 \text{ mW}/\text{cm}^2$. No exceedances of MPE were detected at any of the measurement sites.

Comparison of the levels of electromagnetic field energy flux density depending on the height of the base station antennas indicates that the level of electromagnetic radiation on the roofs of buildings when placing antenna equipment on higher antenna-mast structures is significantly reduced compared with the placement of antennas on supports of low height, with the highest EFD levels are reduced when placing antenna equipment BS on high poles, installed directly on the territory of land. Thus the results of instrumental studies of levels of EMR generated by BS, located on the roofs of buildings of different purposes and adjacent to them in some parts of Tashkent city, showed that the levels of EFD were in the range from $0.3 \mu\text{W}/\text{cm}^2$ to $14, 1 \mu\text{W}/\text{cm}^2$. And in no case were exceedances of MPL, according to applicable regulations (SanPiN 0269-09 "Sanitary norms and rules for work with sources of electromagnetic fields of radio frequencies" and SanPiN 0370-19 "Sanitary norms and rules for location and operation of radio electronic facilities in populated areas") revealed. A significant role in this is played by the fact that when planning the placement or modernization of base stations of mobile communications during the development of design documentation volume "Environmental Protection", mobile operators in the project laid decisions to bring the calculated values of the energy density of electromagnetic radiation to values not exceeding the hygienic standards (placement of antennas on elevated parts of roofs or the edges of roofs, the azimuthal orientation of antennas, reducing the transmitter power of base stations).

It should be noted that the roofs of buildings of various purposes (administrative, industrial, social and residential) are places with limited access of people, i.e. access for residents or workers, not associated with the implementation of repair work on the roofs, or in the premises located on the roofs, is extremely difficult or impossible. According to the requirements of SanPiN 0269-09, when carrying out repairs or other works by a professional contingent, the maximum time of being near radio engineering objects during a work shift should not exceed 12 hours a day MPL EFD RF should not exceed $16.6 \mu\text{W}/\text{cm}^2$. Considering the above, is possible to decide on the establishment of MPEI of electromagnetic radiation frequency of over 300 MHz on the roofs of buildings of different purposes does not exceed $16.6 \text{ mW}/\text{cm}^2$, provided that the indoor EFD of residential and public buildings will not exceed the established existing sanitary standards values of $2.5 \text{ mW}/\text{cm}^2$.

Conclusions:

1. Levels of EMR RF, created by BS on the roofs of buildings of various purposes and adjacent territories, established according to the current sanitary standards and requirements, did not exceed MPLs for the studied objects.
2. Placement of BS on maximally elevated sites of residential areas, as well as the use of maximum possible height of AMS will significantly reduce the level of irradiation of buildings and inhabited territory.
3. Staying of people on roofs of buildings of different purpose with their professional activity of not more than 12 hours allows increased EFD of electromagnetic radiation on the roofs of buildings up to $16.6 \mu\text{W}/\text{cm}^2$.

References:

1. Berezin I.I., Popov A.D. Social and hygienic problems of state sanitary supervision of cellular base stations. // San. doctor. - 2013. - № 1. – pp. 47-49.
2. Grigoryev O.A., Nikitina V.N., Nosov V.N., Pekin A.V., Alexeyeva V.A., Dubrovskaya E. H. "Electromagnetic safety of the population. National and international standards for electromagnetic fields of the radio frequency range".

3. Magay M., Tashpulatova G.A., Gavruk T.I. On some aspects of hygienic standardization of electromagnetic radiation of mobile communications // Infection, immunity and pharmacology. - Tashkent, 2005. - №1. - pp. 171-173 (14.00.00; №15).
4. Tashpulatova G.A., Mavlyan-Khojaev R.Sh. Morphological aspects of polyorgan impact of electromagnetic radiation of radio frequencies in experiment // Infection, immunity and pharmacology - Tashkent, 2015. - №4. - pp. 104-109 (14.00.00; №3)
5. Saveliev S.I., Dvoeglazov S.V., Kozmin V.A. et al. Organization of monitoring of electromagnetic radiation sources in urban environment. (in Russian) // Hygiene and sanitation. - 2008. - № 4. pp.-.87-89.
6. Doncker P. Variographic analysis of public exposure to electromagnetic radiation due to cellular base stations //Bioelectromagnetics. - 2016. - Vol.37, N 8. - pp. 557-562
7. Non-Ionizing Electromagnetic Radiation in the Radiofrequency Spectrum and its Effects on Human Health // Scientific Review: Latin American Experts Committee on High Frequency Electromagnetic Fields and Human Health. (The Edumed Institute for Education in Medicine and Health Independent Research Group on the Impacts of Mobile Technologies on Health). – 2010.- 186 p.
8. Repacholi M. Science and precautionary measures in EMF policy. IOP Conference Series: Earth and Environmental Science 10, 012001, Online publication date:1-Apr-2010.: <http://iopscience.iop.org/1755-1315/10/1>
9. WHO Fact Sheet № 226. Electromagnetic fields and public health. Radars and human health. // WHO, Geneva, 1999. P. 3.

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**УЗБЕКСКИЙ МЕДИЦИНСКИЙ
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**UZBEK MEDICAL
JOURNAL**

№5 (2021)

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