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"VERNADA" EQUIPMENT FOR PROTECTING LIVING SYSTEMS FROM NEGATIVE IMPACT OF CELLULAR NETWORK BASE-STATION ANTENNAS
TEST REPORT

Kyiv -2009

INTRODUCTION

Scientific and technical progress leads to the increased importance of preventing living systems from being affected by hazardous industrial emissions, related to the use of various technical equipment, structures, materials, and facilities, as well as specificity of artificial spatial organization of the environment and selected architectural forms. "Magnetic web," and "electromagnetic smog" are the terms that define hazards chasing humanity as a price we have to pay for the advances of civilization.

Sizes of sources of electromagnetic radiation used in industrial, military, and communication areas simply cannot be assessed by statistical means. Technology impact unaccounted for by industrial safety rules or health standards are most frequently associated with torsion fields which are created in the process of operating radio electronic equipment generating low level broad band electromagnetic fields (cellular network base-station antennas, mobile phones, PC monitors, TVs, etc.). Such impact can cause unacceptable health risks.

Currently available knowledge of torsion field interaction determines an opportunity to develop and use measures of protecting living systems from hazardous industrial radiation including torsion radiation. (Ukrainian patent No.29839, US patents No. 6,548,752, 6,563,043, and French patent WO/2008/037719).

Protective equipment "VERNADA" is a product of SPINOR INTERNATIONAL, Ltd (Ukraine) designed to protect living systems from torsion radiation of cellular network antennas.

Fig. 1.
One of the VERNADA equipment versions installed at a base station grounding

Test objective: to establish the presence of hazardous impact associated with torsional radiation generated by cellular network base-station antennas on living systems, and evaluate the effectiveness of protection provided by VERNADA equipment against the mentioned negative impact.

The test was conducted by:

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V.S. Kutsenko, doctor of agricultural science, sub-department chair, Sub-Department of Ecology
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From the Ukraine Institute of Human Ecology:
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Technical staff.

The test was carried out at a cellular network base station located in the village of Bilogorodka, Kyiv-Svyatoshyn district, Kyiv region. The base station is built outside the village boundaries which allowed to limit the interference of other industrial factors typical for a big city on the test results.

Prior to testing VERNADA protective equipment, a torsion filed generated by the cellular network base-station antenna operating within 900-1800 MHz bandwidth was identified. The presence of a torsion field was determined using IGA-1 system manufactured by /Lait:-2/ company, Ufa, Russia, No. 0702018.

IGA-1 is a high-sensitivity meter of electromagnetic fields which also responds to an informational (torsion) component of electromagnetic radiation. It is tuned to a fixed receiving frequency within a very-low frequency band. An output parameter for the equipment is a phase-displacement interval at a receiving frequency whose value changes on the borderline between torsion fields and anomalous fields of unknown origin. An area covered by a torsion field generated by a cellular network base-station antenna is identified by taking multiple measurements of torsion field boundaries in cardinal directions.

The test was conducted over 7 days.

The experiment consisted of the following phases.

Test phases:

- Identifying a torsion field generated by a system "lightning rod – mast – base-station antenna – grounding" located in the village of Bilogorodka using IGA-1 equipment
- Performing kinesiological test with volunteers
- Taking volunteers' electroencephalograms before and after the installation of VERNADA equipment.
- Detecting changes in water quality under the influence of left torsion fields generated by the cellular network base-station antenna before and after the installation of VERNADA equipment in order to eliminate a negative impact of base-station left torsion fields.

Preparing IGA-1 for use:

After turning on a power switch, and having the equipment warm up for 3 minutes, the equipment functionality was verified by placing a left hand at a distance of 5 to 10 cm from the

antenna; at the same time, an indicator point moved from "0" to "+10" or "-10," and remained in the off-scale position. This indicates normal equipment functioning.

Fig. 2.
IGA-1 equipment

Operating IGA-1:

The presence of torsional radiation emitted by cellular network base-station antennas is determined as follows: once the instrument indicator point is back to 0, its antenna is oriented in the direction of an expected torsion field source. By moving slowly in the indicated direction, an operator finds a place where the indicator point starts to move. Thus, one of the points in the zone containing a left torsion field is detected. By repeating this measurement multiple times, one may define a zone with a left torsion field. The measurements have been taken prior to the installation of the protective equipment.

The measurements completed supported the assumption that a cellular network base-station antenna generates torsional radiation.

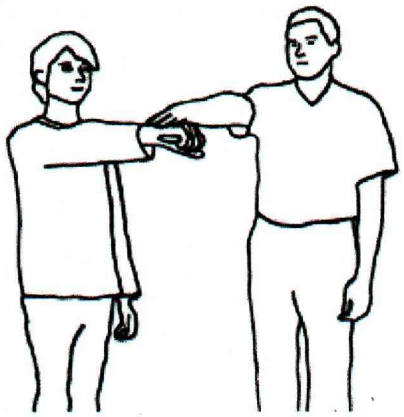
Repeated measurements carried out after the installation of VERNADA protective equipment proved the absence of the torsion field in the area surrounding the base station tower.

Methodology for Verifying Effectiveness of VERNADA Protective Equipment

1. Simple Kinesiological Test

To verify a negative impact on human body caused by a torsion (informational) component of cellular network base stations, as well as to check the effectiveness of protection provided by VERNADA equipment, the following simple kinesiological test has been conducted.

Two people are required to carry out the experiment. The first participant enters a left torsion field zone generated by the base station, raises his arm forward, and holds it horizontally. The other participant presses on the top of the first participant's wrist (as shown in the drawing).
The first participant puts maximum efforts to keep his arm in position. Both participants remember the level of arm resistance. After that, the first participant remains inside the left torsion field zone produced by the base station after the installation of VERNADA equipment,



waits for 20-30 seconds, and then both participants repeat the arm test and register the strength of arm resistance.
The experiment has shown that the arm resistance becomes considerably stronger when a participant remains at the same place near a base station, but the protective equipment has been already installed. This provides a clear evidence of the impact a torsion (informational) component of the base-station radiation has on human body, and of the possibility to protect against such impact. Quantitative characteristic of the enhanced arm resistance can be obtained using a digital electronic dynamometer.

2. Electroencephalogram Method

This method allows to establish the presence of hazardous impact produced by torsional radiation of cellular network base stations on living systems. The effectiveness of protection can be verified by detecting changes in volunteers' electroencephalograms. **Electroencephalograms** were taken by experts with the neurophysiology laboratory of DSSPN Ukrainian Research Institute on 10 August 2009 using a hand-held electroencephalograph with a self-contained power supply.

At the beginning of the experiment, a reference measurement of volunteers' EEG was taken under the influence of VLF-radiation of the base station and its torsion component without VERNADA protective equipment. The results of one of the measurements are shown in Fig. 1, and the related description. One hour later a repeated EEG measurement was taken the influence of VLF-radiation of the base station and its torsion component with VERNADA. The results of that measurement are shown in Fig. 2, and its description.

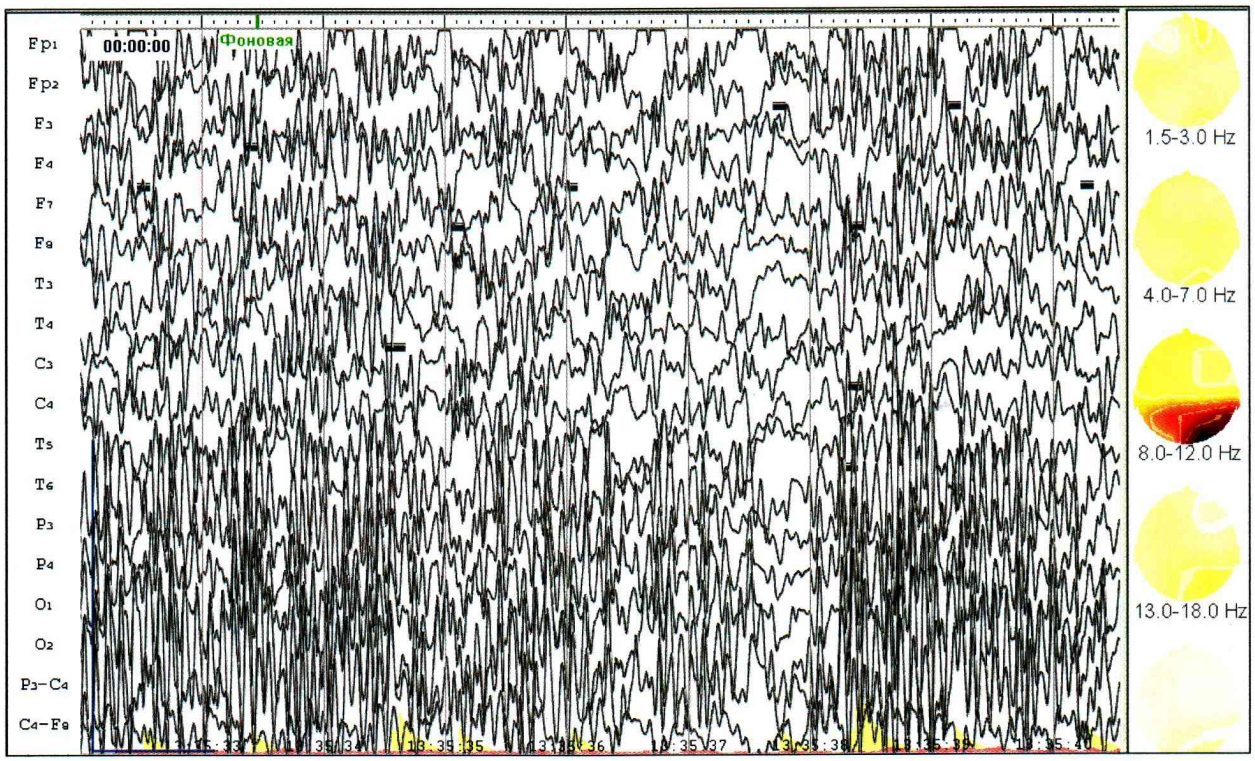


Fig.1. A volunteer stays inside the base-station left torsion field zone.

Example of Low-Voltage EEG

Mean peak-to-peak amplitude (active value) of the electroencephalogram was 5.8 μV; its maximum level is found in amplitude excursion O2 and equals 12.6 μV, and its minimal level – in amplitude excursion C4 and equals 3.7 μV. For the provided EEG fragment, a typical peak-to-peak value is 8.2 μV. Maximum peak to peak is recorded in excursion O2 and equals 52.1 μV. In the provided EEG fragment, 8.0 – 12.0 Hz rhythm prevails with the frequency of 10.13 Hz. A 4.0-7.0 Hz rhythm is subdominant with the frequency of 3.75 Hz. Zone differences of the alpha rhythm are well expressed. Hemispheric asymmetry calculated using the formula (D/S-1)*100% constitutes 25.0%, electroencephalograph energy is higher in the right hemisphere. Its value calculated using the formula (D/S-1)*100% constitutes 149.2%. The rhythm correlation in the provided EEG fragment is as follows: 1.5-3.0 Hz - 17.2%, 4.0-7.0 Hz - 19.2%, 8.0-12.0 Hz - 37.8%, 13.0-18.0 Hz - 17.0%, and 19.0-30.0 Hz - 8.9%. Median spectrum frequency is 8.98 Hz, in left-hemisphere excursions - 9.09 Hz, and in right hemisphere - 8.88 Hz. The maximum recorded median spectrum frequency is 10.26 Hz in excursion T6, and the minimum is 7.29 Гц in excursion F4. Things to come into notice include: hemispheric asymmetry higher than 20.0%, reduced median EEG spectrum frequency (less than 10 Hz), local decrease of median spectrum frequency in excursions F4, and T5 (more than 1 Hz from symmetrical).

Fig. 2. Volunteer's electroencephalogram after the installation of VERNADA protective equipment.

Example of Low-Voltage EEG

Mean peak-to-peak amplitude (active value) of the electroencephalogram was 5.3 μV; its maximum level is found in amplitude excursion O2 and equals 9.7 μV, and its minimal level – in amplitude excursion C4 and equals 3.0 μV. For the provided EEG fragment, a typical peak-to-peak value is 7.5 μV. Maximum peak to peak is recorded in excursion O2 and equals 42.6 μV. In the provided EEG fragment, 8.0 – 12.0 Hz rhythm prevails with the frequency of 8.38 Hz. A 4.0-7.0 Hz rhythm is subdominant with the frequency of 4.50 Hz. Zone differences of the alpha rhythm are well expressed. Hemispheric asymmetry calculated using the formula (D/S-1)*100% constitutes 1.9%, electroencephalograph energy is higher in the right hemisphere.

The maximum asymmetry is observed within the range of 19.0 – 30.0 Hz in the frontal excursions. Its value calculated using the formula (D/S-1)*100% constitutes 91.0%. The rhythm correlation in the provided EEG fragment is as follows: 1.5-3.0 Hz - 21.8%, 4.0-7.0 Hz - 24.2%, 8.0-12.0 Hz - 25.1%, 13.0-18.0 Hz - 19.6%, and 19.0-30.0 Hz - 9.3%. Median spectrum frequency is 8.52 Hz, in the left-hemisphere excursions - 8.80 Hz, and in the right hemisphere - 8.24 Hz. The maximum recorded median spectrum frequency is 10.42 Hz in excursion F7, and the minimum is 6.86 Гц in excursion F4. Things to come into notice include: slow-down of the dominant alpha rhythm (less than 8.5 Hz), reduced median EEG spectrum frequency (less than 10 Hz), local decrease of median spectrum frequency in excursions Fp2, F4, F8, and T5 (more than 1 Hz from symmetrical).

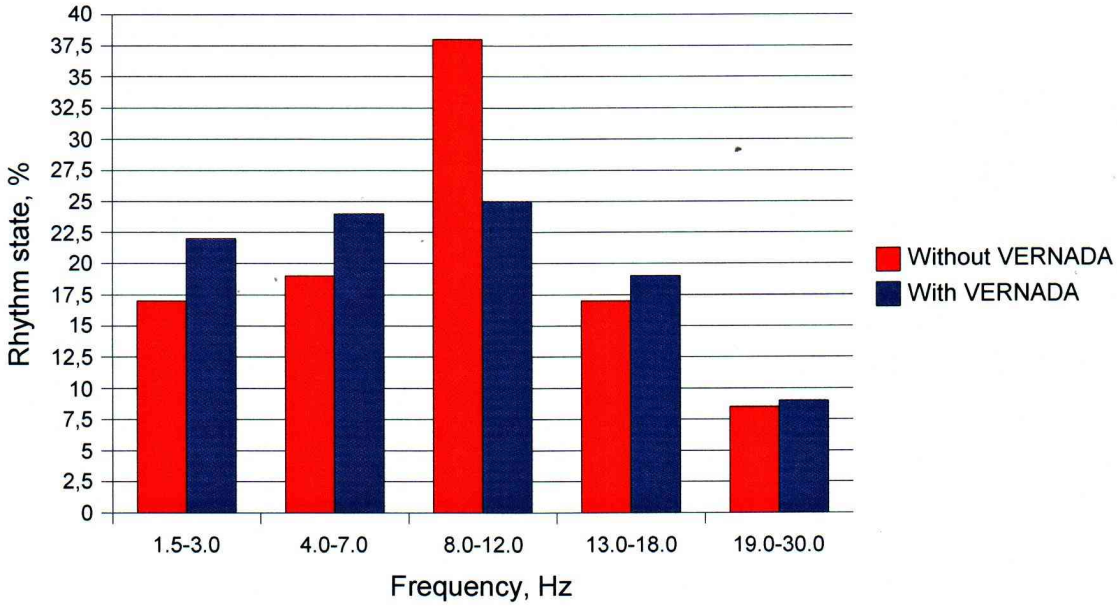
If one compares the volunteer's EEG taken, when he was located in the action zone of the left torsion field without VERNADA protection, with the EEG taken after the protection was provided, one can observe that, without VERNADA protection, EEG showed high amplitude alpha-activity with prevailing values in cervical areas of the left hemisphere, i.e. a dominating hypersynchronous activity. And while protected by VERNADA equipment, the alpha-rhythm amplitude lowered, stopped being hypersynchronous, and a normal distribution of alpha-rhythms, as well as theta-rhythms appeared. **Consequently, it can be concluded that left torsion fields may produce excessive negative impact on users through thalamus (thalamic structures), and an excessive arousing influence is exerted through limbicus**. In a person with paroxysmal activity, it may stimulate certain negative effects at a psychoemotional level in the form of fits of aggression, epilepsy, and other phenomena. **The installation of VERNADA protective equipment at a base station allows to decrease such hyper-arousing impact significantly.**
While the amplitude of the beginning alpha-rhythm was 10.13 Hz, i.e. fast, with VERNADA, the amplitude of alpha-rhythm became 8.38 Hz with a normal distribution among cervical areas of an alpha- and theta-rhythm which was not visible due to the high-amplitude hypersynchronous alpha-rhythm. In the first case, it was still a version of a disorganized alpha-rhythm. In the second case, it was an organized alpha-rhythm of moderate modulation with a normal functioning of thalamic cortical bonds.

Averaged results of the test are presented in Table 1.

Table 1

Mean peak-to-peak amplitude μV	**Dominant rhythm**	**Sub-dominant rhythm**	**Rhythm correlation**					
			1.5-3.0 Hz	4.0–7.0 Hz	8.0-12 Hz	13-18 Hz	19-30 Hz	Median frequency, Hz
Background EEG – 1 min (eyes closed – 15 sec) [base station not protected with Vernada equipment]								
5.8	f = 8-12 Hz at frequency f = 10.13 Hz	f = 4-7 Hz at frequency f = 3.75 Hz	17.2%	19.2%	37.8%	17.0%	8.9%.	8.98
Background EEG – 1 min (eyes closed – 15 sec) [base station protected with Vernada equipment]								
5.3	f=8-12 Hz at frequency f=8.38 Hz	f = 4-7 Гц at frequency f = 4.5 Hz	21.8%	24.2%	25.1%	19.6%	9.3%	8.52

Correlation between EEG α-rhythms under the impact of cellular base-station radiation on human brain.



3. Verifying the Impact of Low Electromagnetic Fields Produced by Cellular Base-Station Antennas on Water Quality

One of the important environmental problems today is an issue of impact exerted by cellular communication base stations installed on the roofs of residential and office buildings. Electromagnetic radiation of station antennas is low, and seemingly complies with current safety standards, but since it is a technogenic field which a man cannot sense with the help of receptors, such environment cannot but influence human health.

Two high-quality brands of bottled drinking water – "Prozora," and "Goryanka" - were used as detectors of a very low electromagnetic field and its torsional component.

Water as a natural detector must remain for a certain time period (24 hours) at the location of a cellular base station to "feel" a background impact of antenna radiation.

For comparison, a reference water was obligatory placed at the same location but it was shielded from a direct antenna impact with the help of a Faraday cell and a torsional polarizer. Then physical properties of these two waters were compared, and a conclusion about the presence of antenna impact was made.

Water samples were encoded to prevent the Institute staff from manipulating the test results.

Test methodologies. Methodologies utilized are the methodologies of conducting physical experiments that have been developed by the Institute of Human Ecology and are applied to the analysis of drinking water quality. These are standardized (physical) methodologies for measuring water acid-base balance **pH**, specific conductivity **σ** in micro-Siemens (μS), oxidation-reduction potential **(ORP)** in mV, presence of structural order (fractality) of drinking water, and standard order using the crystal optics method

The test results are presented in Table 1.

Table 1

Type of bottled water	pH	σ(μS)	ORP (mV)	Structural order
"Prozora" reference	8.35	180	115	Fractal
"Prozora" irradiated	8.10	414	130	Fractal asymmetry impaired
"Goryanka" reference	9.39	70	107	Fractal
"Goryanka" irradiated	8.84	280	122	Fractal asymmetry impaired

The table shows that the impact of background electromagnetic radiation and its informational component caused specifically by a cellular network base-station antenna produced significant negative changes in physical properties of drinking water samples (relative to the reference water samples). "Goryanka" is more sensitive to background fields as a water with somewhat better bioenergentic informational properties. The irradiated water shows instability in the duration of its storage after irradiation relative to the reference water.

Conclusions:

1. It has been established experimentally, that left torsion fields emerge and are extended over long distances by a "lightning rod – mast – base-station antenna – grounding" system, when the systems of interest are located in Earth's crust tension zones with circulating water, in geopathogenic zones, in the Earth's crust ruptures, etc.

2. The conducted test demonstrated the presence of hazardous impact on human body exerted by left torsion fields of the "lightning rod – mast – base-station antenna – grounding" system.
The hazardous impact of cellular network base-station antenna torsion radiation on human body has the following effects: left torsion fields may extend their negative impact through thalamis (thalamic structures), and through the limbic system (causes excessive arousing effect which in people with paroxysmal activity can provoke certain negative consequences at psychoemotional level in the form of aggression, epilepsy, etc.).

3. First experimental data have been obtained demonstrating that natural drinking water changes (worsens) its properties under the influence of an electromagnetic field associated with a cellular network base-station antenna, and consequently is a natural detector of background technogenic electromagnetic fields, particularly cellular network base-station antennas located in a city residential area.

4. "VERNADA" protective equipment which through inversion transforms left torsion fields into right can considerably reduce the impact of cellular network base-station antennas associated with background technogenic electromagnetic fields, and their informational component.

5. "VERNADA" equipment can be recommended to eliminate causes of the negative impact that the left torsional component of the "lightning system – mast – base-station antenna – grounding" system has on human body.

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The above is a true translation of the original document. Head of Translation Agency
07.12.2009

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