

Technical Sciences

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TRANSPORT SAFETY IN UKRAINE

The major causes of traffic accidents are: weather conditions and time of vehicle operation, technical condition of a vehicle, discipline of road traffic parties, and the effect of the environment on psychological state of a driver.

A lot of factors of environmental influence on traffic accidents are determined. One of these factors is a level of magnetic field of Earth and other electromagnetic fields affecting driver's reactions. The analysis of the references shows that geomagnetic field changes result in driver's professional skills breakdown, in other words these changes affect driver's psychophysiology.

Magnetic field of Earth and the external magnetic field appear the most intensively in lithosphere deep fault zones, particularly in the areas of their intersections. They are stimulated by solar activity, cosmic radiation, terrestrial physical and tectonic processes, groundwater flow, technological and other processes. Magnetic storms that arise under influence of charged particles from the Sun, and get to near-Earth space, convert into electric waves and induce telluric currents in the Earth's crust. Under strong impact of geomagnetic and biomagnetic fields these zones are geo-pathogenic zones.

The facts about the interaction between man and environment, accumulated in the world, particularly in the second half of the XX century, have substantially changed the idea of the effect of individual components of environment on human health. The condition of human environment depends

not only on its man-made pollution, but also on a number of nature factors, among which a dissimilarity of the crust as a zone of discontinuous tectonic faults and stresses, specified as geo-pathogenic zones play the leading role. It is not excluded that certain regional combinations of geo-pathogenic zones, which differ only in the parameters of anomalies in geophysical, geochemical and other fields, being similar in the mechanism of their effects on human body, correspond to different types of geological structures of the Earth as a whole.

There had been conducted long-term and strictly scientific research on anomalous zones in the UK, USA, Canada, Germany, Austria, France, and Switzerland since the 80s. This research had fully confirmed the assumption of the existence of peculiar geo-pathogenic zones on Earth. According to long-term observations of domestic and foreign researchers geo-pathogenic zones are the risk factors that significantly increase the risk of systemic disease, stress, mental disorders and downturn of the immune system of human body. When affecting human body magnetic field, magnetic storms as abnormal aspects of natural alternating magnetic field of the Earth change the parameters of biomagnetic field of the body. Thereby the parameters of electric fields of corresponding organs change.

Thanks to the latest advances in quantum physics it is known that a living organism, as a non-equilibrium open environment is a set of molecular structures. These molecular structures are well-ordered and behave as a single entity in reactions and conduct in time and space. Therefore, any outside influence on one of the molecular structures directly affects the state of the molecular system, organ, and organism as a whole and results into a change of their condition. The "energy system" of a body is responsible for structural and functional consistency of the biological object subsystems, for interaction between an organism and environment, for functioning of regulatory and adaptive mechanisms (for example, the immune system) and for retention of

viability. Disruption to this system of a biological object causes the development of various pathologies.

A P. Dubrov considers geo-pathogenic zone as a geophysical anomaly and calls it a reactive zone in which different kinds of people's reactions occur under effect of terrestrial radiation. He believes that geo-pathogenic zones on highways are particularly dangerous. In his opinion, even a short-time stay in such a zone causes driver's sudden loss of consciousness and orientation, as a result of peculiar stress. For example, a number of traffic accidents occurred on some section of a highway in good weather, on a level road, where either a black wall or the fog, or pedestrians running across the path and trucks racing towards had suddenly appeared in front of the road parties. And in fact, none of these events happened. Drivers recalled that their reactions had become slow, they complained of a strange feeling, half-asleep relaxed state, and aching pain in chest.

In Ukraine, this "mystique" was put into scientific base by Doctor of Technical Sciences L. I. Sopilnik. L. I. Sopilnik accompanied with researchers from the Lvov Polytechnic Institute started to explore the scenes of traffic accidents with a variety of devices. It was concluded that there are sections of roads (geo-pathogenic zones), where the Earth's electromagnetic field is 200-650 times higher than the acceptable norm. The researchers detected the existence of other fields of unknown origin. On the basis of obtained results there were prepared some electromagnetic maps of major regional roads – the parameters were measured every 25 meters. Then this map was compared to the placement of scenes of traffic accidents. The computer processed data proved that 98% of accidents had occurred in geo-pathogenic zones. Among the other, all the traffic accidents had occurred once every 28 days, and never everyday.

A specialist in liquid crystals, Ukrainian scientist, Doctor of Technical Sciences, Professor Zenon Gotra suggested his hypothesis of what is happening. It is known that the cornea of the eye is made of liquid crystals, and when a

driver gets into a geo-pathogenic zone under the influence of the intense magnetic field of the Earth they reorient, and all the processes in the brain get disrupted at cellular, molecular and protein levels. Figuratively speaking, the driver catches a peculiar concussion of the brain and, for some period of time, he is not able to assess the situation on the road on his own. The reactions become dozens of times more slow, and the eye watches so-called "previous frame": an empty road that had actually been empty a few seconds before.

Scientists from the Institute of Geological Sciences of Ukraine studied geo-pathogenic zones in some scenes of traffic accidents and found there spikes in emissions of radon, thoron, helium, carbon. Besides, the natural radiation of the Earth's crust intensifies under the impact of high-voltage power lines, generators, various repeaters. These units make the brain of a man who gets to geo-pathogenic zone assess the things he watches inadequately, in addition there may happen a brief loss of consciousness. That phenomena cause traffic accidents.

Thus, the zones of geodynamic activity mainly caused by modern tectonic movements and processes in the Earth's crust are supposed to affect human health by geophysical, geochemical and energy fields, and also by endogenous gases. Complete understanding of the nature of geo-pathogenic zones phenomena, is possible only when studying it thoroughly and without bias.

The analysis of the current state of theoretical bases and modeling of traffic management shows that there is no comprehensive theory of road traffic safety, which would help to detect and eliminate dangerous (geo-pathogenic) sections of roads. To solve this issue, it is necessary to create regulatory and legal bases, normative and technical bases for safe functioning of motor transport, to develop a set of state and industry standards and to amend the existing ones.

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