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Infrasound in Wind Energy

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The fact is that acoustic waves are harmful for the service staff in industry, in Wind Energy and in transport some times. The standards for security of people working under the influence of low frequency acoustic waves (LFAW) have been worked out and adopted. In accordance with those standards even at the sound pressure level of 100 dB time of staying people in the low frequency acoustic waves spreading zone should be limited. Review of the scientific works in the inadequate research area of the acoustics in particular: in the infrasound oscillations is presented. It was analyses 803 denominations that have been published for more than 20 years. The review came into being as the monography “The peculiarities of the acoustic processes within the infrasound frequency range”. In ten chapters of the book the author describes the works about infrasound in nature; peculiarities of its spreading; influence of infrasound upon the biological beings; infrasound noise of wind equipment and vibrations; construction of generators and of significance horn in them; the methods and equipment for measurements of infrasound signals; the area of technological application of infrasound generators working in liquids and gases. One of the ways of LFAW generating is by interaction of powerful permanent airflow with surface in the state of oscillatory movement has been already discovered. Another way of LFAW generating is on the basis of vortex sound phenomenon the nature of which is connected with vortexes formation in the air flux during flowing round the obstacles and is already known. There are many works about LFAW produced by different types of machines with rotating parts and units: turbines, derricks, building machines, construction equipment, turboprop-airplanes and helicopter screws. In atmosphere low frequency acoustic waves are generated by a flux flowing round a very rough surface, in particular around mountain

masses. Powerful single discharges or an explosion can also generate infrasound. In such a case LFAW are generated as one or some harmonics in the common spectrum of noises. LFAW are generated in the atmosphere by the bodies moving with high velocities such as meteors, high-speed trains, underground electric trains. The sound pressure increasing was registered in tunnels. A LFAW of 4 Hz was registered during rocket starts. On reaching supersonic barrier by an aircraft, blasts appear. LFAW heat sources of significant interest are engines of airplanes and rockets. Energy peak is observed at 0.1-2 Hz and 16-18 Hz frequency range. It is possible the conclusions make, that infrasound is the problem in the acoustic of the Wind Energy.

[1] G. Sokol. Some Aspects in Low Frequency Acoustic Processes (2000).

[2] G. Sokol. Infrasound Review, Annual Scientific Conference GAMM 2001, EHT Zurich February 12-15, 2001. – Zurich:, 2001 - p. 136.