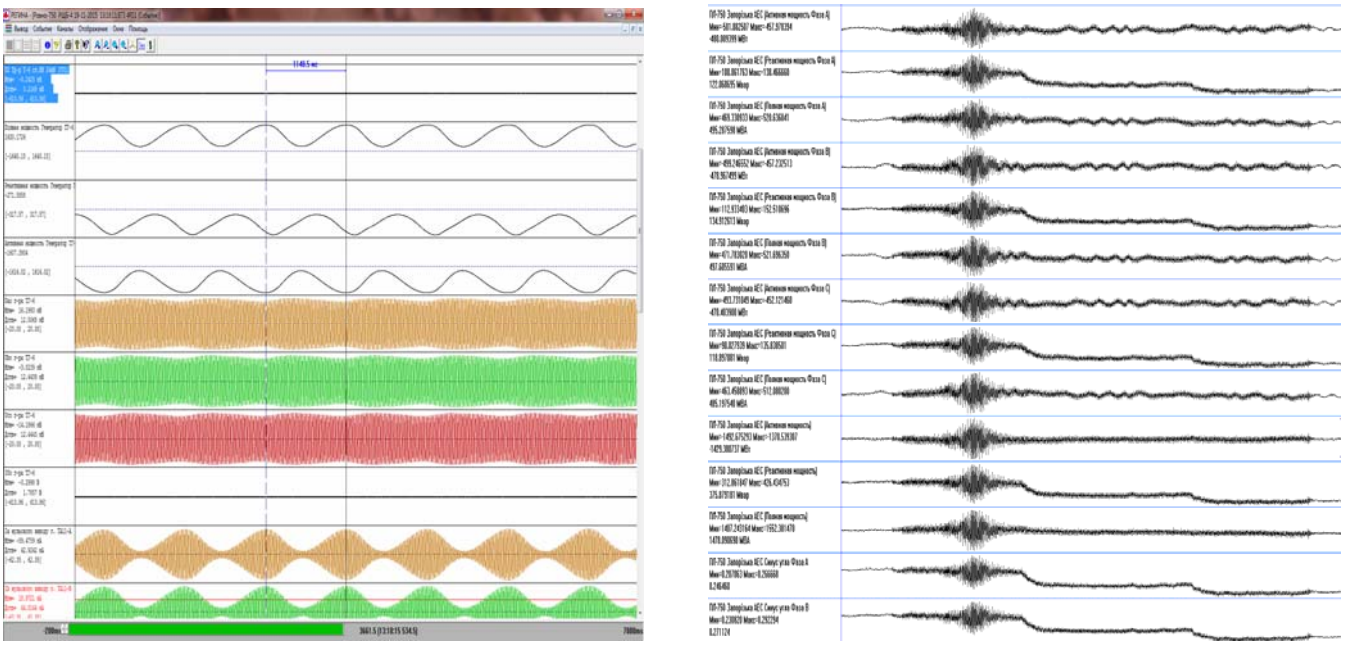
1.04. MEANS FOR IDENTIFYING HAZARDOUS LOW-FREQUENCY ELECTROMECHANICAL OSCILLATIONS IN THE INTEGRATED POWER SYSTEMS

Sometimes there are low-frequency (up to 1 Hz) oscillations of the operational parameters of IPS appeared in the integrated power systems (IPS).



Registrogramms of low-frequency oscillations in the IPS of Ukraine as of 19.11.2015 and 18.02.2017

Most of system failures on the world's IPS occurred due to the onset and amplification (amplitude growth) of such oscillations and resulted in disconnection of transmission lines, blocking of power plants, de-energization of power consumers in large areas.

To identify and asset a threat that low-frequency oscillations may pose to IPS, special software tools are presented, which process a value of operational parameters of IPS measured with Regina-Ch – electrical measuring and recording devices developed in the institute of Electrodynamics of the NAS of Ukraine. The software can be used both offline (to analyze the registered operational parameters of IPS in order to determine weakly damped oscillation modes) and online (to detect in a timely manner a latent threat of low-frequency oscillations that can lead to system failure). In online mode, the software function as a monitoring system of low-frequency oscillations implemented on the basis of Regina-Ch devices, which are installed at power plants and electrical substations of IPS. Due to a timely notification about weakly damped modes in the low-frequency oscillations of operational parameters and their amplification, a dispatching staff of IPS will be able to take measures to prevent an emergency situation caused by these oscillations.

Advantages. The above-mentioned software tools have no analogues in Ukraine and the near abroad. Their use will increase an operational reliability of IPS, thereby preventing an occurrence of system failures caused by low-frequency oscillations.