3.10. METHOD OF SEISMO-ACOUSTIC EVALUATION OF STABILITY AND STRENGTH OF ROCKY OBJECTS AND STRUCTURES

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Method of ultrasonic and seismic diagnostics of the state of boards and walls of underground structures, trenches and other construction workings is developed and tested on the series of construction sites.

It is established that dual determination of elastic waves propagation velocity in a rocky massive and movements of the object bearing contour make it possible to trace and interpret variations in massive under the form of "velocity – movements" and "ratio of velocities of transverse and longitudinal waves – movements (deformation)" diagrams. Observed evolutions of trend in indicated indices demonstrate the signs of stage tendency related with variations of stressed-strained and strength state of a medium from elastic deformation to dilatancy. The moment of irreversible deforming of unloading medium is fixed especially definitely by "stress (strain) – ratio of transverse and longitudinal elastic waves" hysteresis curves.

Data of ultrasonic and seismic measurements carried out in parallel with measurements of stresses and strains (movements) performed with specimens and directly in massive of the rock bottoms of objects of Rogunskaya, Irganaiskaya, Sangutdinskaya and Sayanskaya hydroelectric power stations are presented.

Conclusions are made on possibility of unique recording of destabilization of state of tested structure.

Methods of ultrasonic and seismic profiling by wellholes and on the surface of rocky medium respectively, as well as ultrasonic insonification of loaded and unloaded rocky specimens were used.