

Round table discussion: Modern Methods of Engineering Protection Against Hazardous Geological Processes

Annotation: The struggle against geological hazards is one of the most complicated branches of human activities. Geological processes are large-scale, often unpredictable, and they lead to human casualties and huge economic losses. In connection with increasing construction activities, the necessity of study of geological processes, in particular, led to the formation of Engineering Geology as a science of the geological cycle.

While creating an engineering protection, the question of interactions in the “geological engineer, designer, builder” triad is urgent as nowhere else. The all of such things as understanding of geological processes, design decisions, possibilities of their implementation, construction rates, engineering protection costs, and, most importantly, safety of protected objects and people depend on the quality of the interaction between the members of this triad, and on the professional skills of each of them. If to take only one incorrect decision at each of the corresponding three stages (engineering surveys, designing, construction), the engineering protection will not only be useless, but also, on the contrary, will make the situation worse and all the huge resources will be muddled away. Very unfortunately, there is no need to go far to find examples. They are: the sensational landslide that almost paralyzed the Ulyanovsk city life, destroying one of the streets; perpetual landslides and mudflows that constantly threaten towns, motor roads and railways in the Greater Sochi area (and also in the Caucasus in whole); and, of course, the Crimean scales of geological processes and incorrect decisions. All of them are economic losses of billions of roubles, and human lives.

While engineering-geologically studying and designing, a complex approach is important. This approach includes: analysis of the existing situation; assessment of the influence of engineering structures on engineering-geological conditions; correct accounting for complicative factors (specific soils, groundwater, earthquake actions); determination of factors that increase the probability of the development of dangerous geological processes; and compensation of the influence of these factors with the use of engineering solutions.

The development and implementation of new technologies based on long-term Russian and foreign experience, as well as the improvement of standard technical solutions play an important role in the protection against dangerous geological processes.

We suggest discussing a wide range of issues related to the struggle against dangerous geological processes, including:

- special requirements and complexity of engineering-geological surveys in the territories with developed dangerous geological processes;
- modeling methods of geological processes and engineering protection, as well as the issue of geological data provision;

- modern engineering protection technologies or concrete walls: what should be preferred to ensure the safety of objects?;
- engineering protection against landslides and against erosion: is it always very expensive?;
- geotechnical monitoring in the areas with developed dangerous geological processes before, during and after construction: is it possible to reveal and prevent these hazards at the early stages?

Report 1: Specific requirements for engineering-geological surveys of landslide areas (Bershov Alexey, PetroModeling)

Report 2: Self-opening ground anchors as a modern method of preventing and terminating of dangerous geological processes (Turaev Aleksey, VAR)

Report 3: Geotechnical monitoring of structures in areas of development of hazard geological processes (Frolov Konstantin, PetroModeling)

The list of participants from the companies VAR and PetroModeling

VAR Group of companies

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PetroModeling Group of companies

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