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Integrated Assessment of the Underwater Pipeline Construction Conditions

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ABSTRACT

The assessment involved drilling data from marine geophysical investigations and hydrographic and environmental analysis data. Zoning and typification of different sites have been conducted using factor analysis techniques as modified for conformity analysis.

KEY WORDS: Pipeline, tsunami, coast protection, earthquake.

INTRODUCTION

Recently, we consider it important to analyze social, economic, political consequences of the extreme situations, ecological situations and accidents, to assess future trends of different large-scale events, and to work out criteria of an assessment of dangerous geological and hydrometeorological coastal processes. Monitoring problems include working out of the tool which would allow making quantitative assessments of possible variations of the sea coasts/water areas characteristics owing to any natural or anthropogenous loads.

Creation of methods of the mathematical description and modeling of global, regional and local variations of the geological environment, biospheric processes of the atmosphere and the ocean, development of processes of their interaction and influence on the shores has the basic methodological character, allowing to unite efforts of experts of various scientific directions in order to decide the general problem on protection of coastal territories against the dangerous natural phenomena.

Over the last years the extremely negative situation developed at the sea coasts of the Russian Federation caused by activation of abrasion, landslips, run-ups, floods, and other dangerous natural or natural-manmade processes which were destroying objects intended for building, sanatoriums, transports or other objects of economy, and which threatened the population safety. Such negative situation was complicated due to high seismicity of the southern and Far-Eastern coasts (up to 8-9 points).

The risk level of damage from dangerous geological and hydrometeorological processes continuously increased, and on the contrary, a protection condition considerably decreased. According to the integrated expert assessments the average multi-year economic damage from coast-destructive processes at the sea coasts of the Russian Federation made more than 5 billion roubles annually. All these factors made it necessary to develop the Comprehensive schedule of events in order to maintain sustainable development of the sea coasts.

METHODOLOGICAL BASIS FOR INTEGRATED ASSESSMENT

Over the last years the extremely negative situation developed at the sea coasts of the Russian Federation caused by activation of abrasion, landslips, run-ups, floods, and other dangerous natural or natural-manmade processes which were destroying objects intended for building, sanatoriums, transports or other objects of economy, and which threatened the population safety. Such negative situation was complicated due to high seismicity of the southern and Far-Eastern coasts (up to 8-9 points).

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Prior to development of construction management bases in the coastal zones we should:

- zone sites allocating relevantly favorable sites (standards) and critical sites;
- carry out identification of natural risks;
- draw up a matrix of risks taking into account their probability, and build risks-profiles with allocation of economic, ecological and social risks, and calculate direct and indirect damages.