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## **PIPELINE TRANSPORT INFLUENCE ON THE ENVIRONMENT ANALYSIS ASPECTS**

The Ukrainian gas transportation system is one of the most powerful in the world, and the most cost-effective way of transporting oil and gas is pipeline transportation, which determines its exceptional role in the economy of our country. Pipeline transport occupies a special place in the unified transport system of Ukraine. Today, almost the entire volume of extracted oil and gas is transported by a system of main pipelines. The creation of pipeline systems, the intensive development of oil and gas production and processing industries are characterized by a significant anthropogenic impact on land and other natural resources, which is manifested in their degradation due to pollution during construction and operation and possible emergency situations.

The main indicator of the efficiency of pipeline transport is the level of operational reliability, man-made and ecological safety, absence of man-made accidents.

Main pipelines belong to the category of facilities, the operation of which is combined with a significant environmental hazard. Numerous accidents on technological pipelines transporting fire and explosive products, poisonous components and toxic substances lead to local and general pollution of land, atmospheric air and water bodies, thereby creating an increased risk to the life and health of the population.

The operation of a significant part of the gas pipelines of Ukraine, which have served their depreciation period, provokes the risk of the manifestation of dangerous defects in parts of the pipeline, which is accompanied by a negative impact on the surrounding natural environment, as a result of which the transported products enter the geosphere, for example, the components of natural gas into the atmospheric air, oil and oil products to soil and water bodies.

The impact of the gas transportation system on the natural environment in different geosystems is not the same and manifests itself with different degrees of intensity. Environmental safety of main pipelines depends on the soil and climatic conditions of their operation. The main reason that causes a violation of the ecological balance during the destruction of main oil and gas pipelines is the aggressive environment of the pipeline space, which affects the metal of the pipe in the places where the insulation is broken.

In the complex system of interaction of linear structures with the geological environment, the following main stages are distinguished: search works; construction; operation.

Each of these stages has an impact on the environment, but the nature of such impact is different. The construction and operation of pipelines have the most negative impact.

At the construction stage, the destruction of the soil massif and the disturbance of the balance of relationships between the components of the landscape are often observed in the pipeline laying zone. The degree of influence of pipeline construction also largely depends on the diameter of the pipes being laid, since the larger it is, the larger the trench prepared for laying the pipeline line should be, and therefore the magnitude of anthropogenic impact on the natural environment increases. For the laying of pipelines, forests are cut down, and intervention in the ecosystems of forest and mixed massifs negatively affects their stability,

causes soil erosion, the formation of ravines, etc. Pipelines that cross waterways are in contact with water, and therefore hydrocarbons that fall into the water during accidents can cause a real environmental disaster, since oil and oil products pollute not only the surface of the water, but also its thickness to the bottom, which is why such pollution is a threat to living organisms that live on the surface, in the water column and on the bottom.

The analysis of the main risks associated with the construction of main pipelines allows us to highlight the main ones, namely: natural risks (torrential rains or floods), topography (mountainous terrain, marshy terrain, laying pipelines under water), technological hazards (features of risks trench and trenchless laying technology), the human factor (defects of pipelines formed during the manufacture of pipes, their transportation, welding, laying, test).

One of the main problems complicating the operation of main pipelines is the transportation of hydrocarbons, the aggressiveness of which is quite high. A significant part of Ukrainian gas fields contains hydrogen sulfide, which causes accelerated destruction of equipment. There is an acute problem of pollution due to the loss of hydrocarbons due to corrosion or the formation of leaks in the walls of pipelines. In the absence of effective control over the condition of pipes and soils in the area of the main pipeline, even minor violations of the tightness of the pipelines after a long time can significantly harm the environment.

The main risks associated with the operation of main pipelines include natural forces and natural disasters, illegal actions of third parties, mechanical actions, rupture of the pipeline pipe, depressurization of the pipeline, pipe connections, shut-off and connecting fittings, pollution threats environment.

Analyzing the system of main pipelines, one cannot ignore the oil and gas pumping stations, which are part of them as mandatory elements. The presence of a complex of powerful pumps, tanks, pipelines, turbines, etc. at such stations makes these objects a powerful source of environmental pollution with hydrocarbons; their operation is accompanied by the formation of hazardous waste, which partially enters the soil, water, and atmospheric air, even during accident-free operation.

In connection with the aging of the gas transportation system, an increase in the number of accidents on gas pipelines of Ukraine has recently been observed, which leads to an increase in the number of local environmental disasters. The main cause of ecological pollution of the natural environment as a result of accidents on main pipelines is their long-term operation, lack of means of remote diagnostics and control of pipelines, transportation of explosive and fire-hazardous substances, military operations on the territory of Ukraine.

Therefore, the specificity of gas, oil and oil products transportation and storage facilities as potential sources of negative impact on the surrounding natural environment necessitates the fastest solution to the problem of preventing emergency situations, and measures to eliminate the consequences of accidents will allow to reduce their scale and reduce the damage caused.

#### Reference

1. V. I. Slobodian Reliability and safety of main pipeline transport / V. I. Slobodian // Pipeline transport. – 2012. – No. 1(73). – pp. 22–23.
2. Korolev P.V. Safe operation of process pipelines of compressor stations / P.V. Korolev, Yu.D. Zyabchenko, D.V. Kolomeev // Pipeline transport. – 2012. – No. 1(73). – pp. 12–15.
3. Saprykin, V.L., The oil and gas complex and energy security of Ukraine: new challenges and new opportunities // Bulletin of NGSU. – 2004. - No. 4. - .S. 28-30
4. Voitsitskyi A.P., Dubrovskiy V.P., Bogolyubov V.M. Technoecology. Textbook - K.: Agrarian education, 2009. - 533p.