MATHEMATICAL MODELING AND OPTIMUM DESIGN OF LONG PIPELINES INTEGRATED INTO THE CITY WATER SUPPLY NETWORK

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Currently, due to the growth of cities and the dense development of the city territory, long pipelines are being created that are built into the city water supply network. Existing methods of computer-aided design of trunk pipelines (TP) have a common drawback - they do not represent solutions for TP sections in an analytical form, i.e. in the form of a single formula, the parameters of which reflect the most important characteristics of the pipeline.

In the presented work, on the basis of the development and formalization of the engineering approach in the design of reliably functioning extended pipelines, taking into account the costs of its creation and operation, a method for the analytical solution of the optimal TP design problem has been developed. The inclusion of engineering practice provides "soft" optimization without sharp pressure drops across sections of the pipeline for its reliable operation.

Keywords: water supply system, extended pipeline, optimal design problem, analytical solution, computer-aided design.

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