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Calculation and Design of liquid-gas ejectors

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Summary

The potential properties of a liquid-gas injector depend upon its extreme parameters. The latter indicate the relationship between 3 space values of ejector parameters. They are: the relationship of gas and liquid expenditures, gas compression ratio, pressure relationships across the nozzle.

The purpose of the report is to give some extreme parameters of the liquid-gas ejector based on experiments with a cylindrical mixing tube. The parameters are calculated according to a mathematical model in accordance with the laws of conservation of mass, impulse and energy with mixing liquid and gas media in the flow channel.

The method of calculation for liquid-gas ejectors with extreme parameters and the solutions of some design problems are represented in the report. Both of them allow to realize the potential capabilities of the ejector and to maintain its safety in the hydrosystem. The proposed method of calculations and design of liquid-gas ejectors has decreased the consumption of water and electrical energy in the range of 20–30% at some Ural heat power stations where they were put into operation. With the proposed method the improvement of water air ejectors in the system of vacuuming the steam turbines and an increase of vacuum in the condenser take place simultaneously.