

Design Energy Efficient Pumping Stations with PIPE-FLO

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Fluid piping software can be used to design highly energy efficient and cost effective pumping systems
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facilitate the design of wastewater lift stations, booster stations in water distribution networks, treatment facilities, and any other piping systems.

Using Fluid Piping Software to Design Energy Efficient Pumping Stations

The need for water and wastewater capacity is continually growing on a global scale, and with rising energy costs and a greater emphasis on being green, the users and designers of pumping systems in this industry are realizing the need for more efficient designs and practices. It is estimated that water/wastewater facilities account for 35% of municipal energy usage (1). With pumping systems being responsible for much of this power consumption, design optimization can result in significant energy savings.

In fact, a considerable number of users, suppliers, and designers in all industries, as well as government agencies and industry consortiums are developing and implementing strategies to improve the energy efficiency of industrial equipment. In most cases, the potential savings is significant. A 1998 DOE market assessment of U.S. industrial motor driven systems estimated an average savings of 11 to 18% with the implementation of energy efficient technologies and practices. Other studies, specifically of pumping systems, have indicated savings as much as 30 to 50% (2,3).

With the number of pumping stations found throughout water distribution and wastewater collection systems, there are many opportunities for improving energy efficiency. However, with the seemingly endless variety of design options, finding the optimal solution can be daunting. Fortunately, for the modern engineer, fluid piping software provides the necessary analysis to design an efficient pumping system or evaluate current installations for potential improvements.

Fluid piping software packages typically allow the user to evaluate a system under different design and operating conditions, as well as determine operating costs for various pump models and configurations. Some even allow the user to perform a complete life cycle cost analysis, taking into account capital, operating and maintenance costs in order to assess the true cost of the system. Fluid piping software is a powerful tool with which the user can evaluate pumping system designs and determine the most efficient and cost effective approach with relative ease. The following is a list of typical fluid piping software features.

- Accurately model any pumping system with as much design detail as necessary.
- Evaluate the model under various design conditions (e.g. pipe size, system configuration).
- Evaluate the model under various operating conditions (e.g. tank level, pump operation).
- Evaluate different pumping configurations (e.g. single or multiple configurations, variable speed drives).
- Select a pump from manufacturers' electronic catalogs to immediately determine how it will operate in a system.
- Compare different pumps from various manufacturers.
- Calculate and compare the operating cost of the various designs for any duration.

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