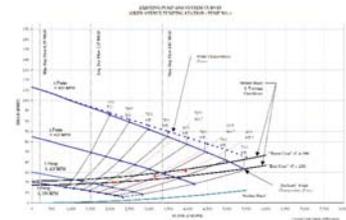


Rensselaer County Sewer District No. 1



Troy, New York



Background

Rensselaer County Sewer District No. 1 owns and operates five wastewater pumping stations servicing the City of Troy, City of Rensselaer, and surrounding communities. Many of the pumps at these facilities – ranging in size from 60 HP to 200 HP – utilize variable speed drives to control pumping rate. The pump and drive systems are all over 30 years old, experience decreased reliability, and are significantly less efficient than current technology. The variable speed drives are liquid rheostat technology and operate at average speeds in the range of 50% to 80%. At these speeds, 20% to 50% of the energy purchased is wasted.

Sewer District officials contacted the New York State Energy Research and Development Authority (NYSERDA) for assistance, and took part in the Flexible Technical Assistance (FlexTech) Program. O’Brien & Gere, a NYSERDA FlexTech contractor, performed an evaluation of the existing pumping stations. This evaluation reviewed the operating efficiency of the existing pumps, motors and drives, and investigated measures to reduce energy consumption at each facility.

Recommendations

Field testing was performed at each of the five pumping stations – including a total of 14 pumps and motors and 11 variable speed drives – to measure actual operating efficiencies of the existing equipment. These operating efficiencies were compared with the expected efficiencies of new energy-efficient motors and drives, and with expected efficiencies of new or rebuilt pumps. Efficiency improvements, together with estimated operating hours and operating speeds, were used to calculate monthly and annual savings in electrical demand (kilowatts) and energy (kilowatt-hours) resulting from the recommended capital improvements.

Study results showed that pump efficiencies were generally 10% to 15% below those expected for new pumps. Efficiencies of existing wound rotor motor and liquid rheostat drive systems were generally about 50% to 80% at typical operating speeds, compared to efficiencies of 95% to 97% for modern variable frequency drives.

Based on the study findings, O’Brien & Gere recommended replacement of all existing wound rotor motors and liquid rheostat drives with new squirrel cage inverter duty induction motors and variable frequency AC drives, as well as replacement of most pump rotating assemblies. In addition to extending facility life and addressing reliability and parts availability concerns, the improvements will decrease annual energy usage by approximately 737,000 kilowatt-hours and demand by approximately 1,120 kilowatts. A summary of estimated capital cost, energy savings and payback period for each facility is presented in the table to the left.

Incentives and Results

Rensselaer County Sewer District No. 1 received **\$34,000** in funding through the FlexTech Program. In addition, Rensselaer County is pursuing potential additional funding of construction costs through NYSERDA’s **New York Energy SmartSM** Commercial/Industrial Performance Program and Peak-Load Reduction Program.

	Estimated Capital Cost	Estimated Annual Energy Savings	Payback Period
Aiken Avenue Pumping Station	\$528,000	\$10,000	5.9 years
Forbes Avenue Pumping Station	\$547,000	\$18,000	4.0 years
106 th Street Pumping Station	\$448,000	\$13,000	2.3 years
Monroe Street Pumping Station	\$1,189,000	\$34,500	5.7 years
Wynantskill Pumping Station	\$66,000	\$1,000	0 years

Note: Estimated payback period for pump, motor and drive upgrades is based on the capital cost differential between the recommended “high-efficiency” upgrades and hypothetical “standard-efficiency” upgrades.



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