



FALCONEER Technologies LLC

**MAKING PLANTS
SMARTER AND SAFER**

Excerpt from

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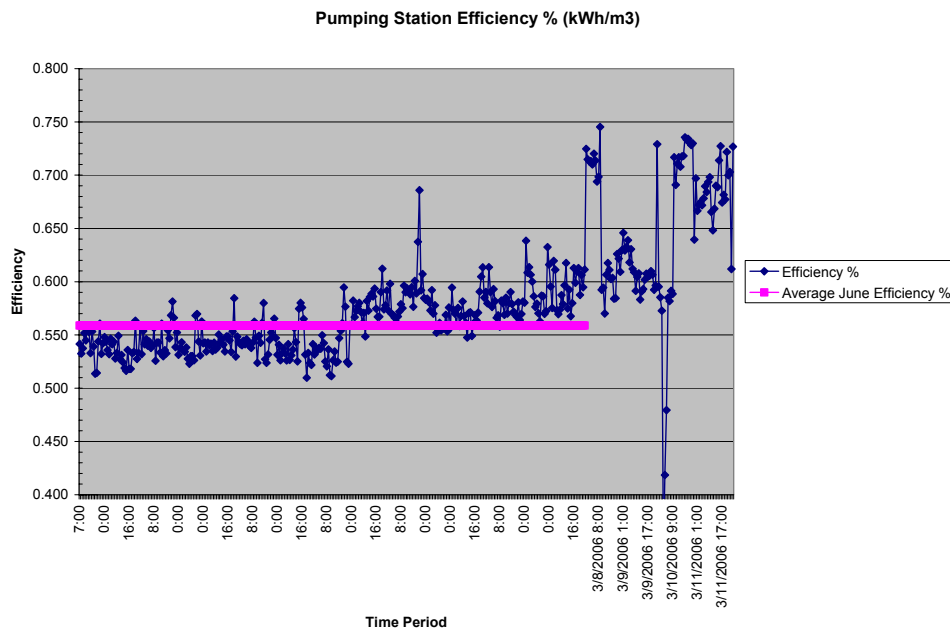
**Mining Your Process Information to Turn Data into Profits:
Focus on Energy Savings In Water and Waste Water**

CASE STUDY – ENERGY SAVINGS FOR A MUNICIPAL WATER & WASTE WATER PUMPING SYSTEM

A pilot real-time Process Performance was installed for a Municipal Water & Waste Water Pumping System looking at the potential cost savings from continuously auditing actual vs. optimal pumping efficiency. Hourly data was available from a SCADA system for the continuous analysis. **The pilot identified periods when the pumping efficiency deviated from average or target or optimal efficiency and the potential associated energy cost savings from these deviations.**

These cost savings would be realized from avoiding these periods or adjusting process parameters as soon as the situation is identified. A quick estimate of the energy savings potential indicates a significant opportunity. Based on the pump curve data and the operating screens, the system operates 2000 hp pumps. Identifying and capturing 5% energy savings on just one would be $0.05 * 2000 * 400 = \$40,000$ (based on roughly \$400/yr/hp @ \$0.10/kwh). With 5 to 8 pumps running at any one time, 5% total energy savings could add up to \$200,000 to \$320,000 per year.

The chart below summarizes pumping system operation as efficiency over the period of the study. Clearly, there are periods of time below average and above average.



FALCONEER Technologies, LLC

4455 Transit Road, Suite 3C, Williamsville, NY 14221

Phone: 716 204-0273

Fax: 716 558-7250

Email: falconeer@falconeertech.com

- **If or when control adjustments can be made in a timely manner early in the non-optimal period to bring efficiency back into control, electrical costs savings can be achieved.** Currently, this action would be by controlling the flow either by number of pumps, header pressure or levels.
- **When above average or target efficiency periods are identified and the engineers advised AT THAT TIME, this creates an optimization opportunity. All the additional information that FALCONEER is managing and analyzing can be quickly reviewed to identify potential causes and reasons.** From this engineering assessment, an appropriate and cost effective solution can be identified and put into place. Once in place, the more optimal conditions and resulting costs savings can be achieved.

The results from the pilot operation period are annualized and summarized in the table below. Even if a more likely achievable 50% of the identified energy saving opportunities are made, the ROI and payback can justify the investment in the FALCONEER solution. These savings are in line with the opportunity to save about 5% at least of the total system energy costs.

Cost saving opportunities identified over pilot periods:

(Basis: Electrical unit Cost estimated at \$0.08/kWh)

STUDY RESULT – WATER PUMPING SYSTEM	Results
1) Cost Deviation from Average Efficiency (\$/3wks)	\$5,000
2) Cost Deviation from Design Efficiency (\$/3wks)	\$18,300

Annual Energy savings

Legend: (a) (Basis: Electrical unit Cost estimated at \$0.08/kWh)

(b) FALCONEER™ IV Process Performance Solution \$45,000: Simple ROI is 1 Yr Savings / Costs. Payback is Cost / Savings.

STUDY RESULT		Savings (a)	ROI(b)	Payback(yrs) (b)
1. Deviation from Avg. Efficiency Basis	Potential annual savings	\$120,000	268%	0.4
	Likely annual savings (50% of potential savings)	\$60,000	134%	0.8
2. Deviation from Design Efficiency Basis	Potential annual savings	\$440,000	975%	0.1
	Likely annual savings (50% of potential savings)	\$220,000	490%	0.2

Potential improvements to capture and maintain the pumping system efficiency electrical cost savings include:

- Use Real-Time Process Performance Solution to help identify most inefficient pump motors and replace them to improve electrical efficiency and costs;
- Use Real-Time Process Performance Solution to help identify most inefficient pumps and modify the impellor size or type to improve pumping efficiency and operate closer to BEP;
- Use Real-Time Process Performance Solution to identify root causes of non-optimal efficiencies as they occur;

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