Ellensburg Wastewater Treatment Plant

MOTOR MANAGEMENT SUCCESS:

Making Good Motor Decisions — The Ellensburg Wastewater Treatment Plant

results

- A reliable process to determine repair v. replace decisions for motors
- A complete, plant-wide database of 80 motors ranging in size from 1/2 to 100 hp
- Knowledge that the plant's motors are not wasting energy
- Confidence in the decision to replace an older, inefficient motor with a new, standard motor
- Savings of $1,650 over the life of each 50 hp motor replaced

Wastewater Treatment Plant Aeration Basin, Ellensburg Wastewater Treatment Plant, Ellensburg, WA.

The Ellensburg Wastewater Treatment Plant was constructed in 1974 and remodeled in 1982. The plant services the City of Ellensburg with a population of approximately 15,000. This secondary treatment facility was designed as a complete mixed activated sludge plant with capacity to treat 8 million gallons per day. It currently processes an average of 3.5 million gallons daily.

project overview

All wastewater treatment plant operators know that sooner or later they are going to have to make an expensive decision: do they rewind or replace a failed motor? Making this decision means knowing facts about the motor's efficiency, maintenance history, and costs — not only the initial costs to buy or rewind a motor, but also its lifetime operating costs.

An important part of making this decision is having confidence "that we will be making the most economical choice," said Irma Grogan, Ellensburg, Washington's Wastewater Treatment Plant Foreman. She knows first hand what it's like to make these decisions.

In 2001, Grogan had to determine whether to replace or to rewind two large 50 hp aerator motors in the North Pond. The aerator company's representative had made a recommendation for a premium efficient motor, but Grogan wanted to do her own analysis. She used the MotorMaster+ 3.0 (MM+), a motor management software program, to analyze two alternatives: rewind the existing motors, or replace them with energy-efficient models. Initial use of the MM+ software showed that it was more cost effective to purchase new motors than to rewind the existing motors. Grogan then used the software to compare the cost effectiveness and simple payback of various new 50 hp motors. Review of MotorMaster's database information determined that the purchase of a new standard efficiency motor offered immediate payback and lifetime savings of $1,650 for each motor replaced. (See Chart 1. Comparison of Motor Rewind v. Replacement Costs and Efficiencies.)

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Chart 1. Comparison of Motor Rewind v. Replacement Costs and Efficiencies

OPTIONS	COST/MOTOR	EFFICIENCY	ANNUAL SAVINGS/MOTOR (kWh & $)	SIMPLE PAYBACK (Yrs)
Rewind Existing Motor	$10,275	89%	None	N/A
Replace with New Standard Motor	$6,878	92%	2,970 kWh and $110 ($1,650 savings over motor's life)	Immediate
Replace with NEMA Premium Motor	$12,673	93.6%	4,837 kWh and $179/year ($2,685 savings over motor's life)	32

lessons learned

MotorMaster+ software simplified the repair v. replace decision-making process. Grogan had to first determine if Ellensburg should replace or rewind the motor, with all expenses considered. Then she looked at costs and her budget. Finally, she presented the idea to her boss, her recommendations supported by hard data from MM+. "MotorMaster+ gave me the numbers I need to justify the purchase," Grogan said.

Grogan has used MotorMaster 3.0+ software for more than just making this purchase decision. With the help of Steve Dunnivant, a field consultant with the Electric Motor Management program, all of Ellensburg's motor inventory and maintenance logs have been entered into MotorMaster 3.0+. Once this was done, Dunnivant made additional visits to train Grogan and her staff to take full advantage of all the software has to offer. MM+ can generate everything from a basic motor inventory list to payback comparisons using local utility rates and downsizing comparisons. "MotorMaster+ is easy for us to work with and having assistance was important," she said. After this training, Grogan and her staff began testing all of the plant's motors to determine their efficiency.

What they learned was interesting. "We found that we don't have antiquated motors. We have old, efficient motors. The motors were good to begin with," Grogan stated. She also learned that the plant's original design was very energy efficient. "We aren't using as much energy as everyone thought; it's not wasted," she said.

Grogan hopes that she won't have to replace very many motors in the next five to 10 years, but on one point, she is certain: "I'll use MotorMaster 3.0+ when I am looking at replacing or rebuilding."

Motor Management Success Story, July 2001

Wastewater Treatment Plant Aerator, Ellensburg Wastewater Treatment Plant, Ellensburg, WA.

project partners

City of Ellensburg
Wastewater Treatment Plant

City of Ellensburg
Municipal Utility

Northwest Energy
Efficiency Alliance

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