



MOTORWISE[®]

Public Utility Commission of Texas

EEIP November 27, 2012



MotorWise

Intelligent Motor Controllers



2006, founded in Dallas, Texas.

2009, The TechnoWise Group Inc. headquartered in Boca Raton, Florida to oversee the national and international activities of the group.

2012, The MotorWise Inc. headquarters in San Antonio due to the enormous opportunities for growth in Texas.

MotorWise

Intelligent Motor Controllers

Manage

- MotorWise is an intelligent AC Motor Controller used to **manage and optimize the power delivered to the electric motor.**

Reduce

- The MotorWise unit identifies partial and intermittent loading conditions and **reduces the voltage applied to the motor in real time.**

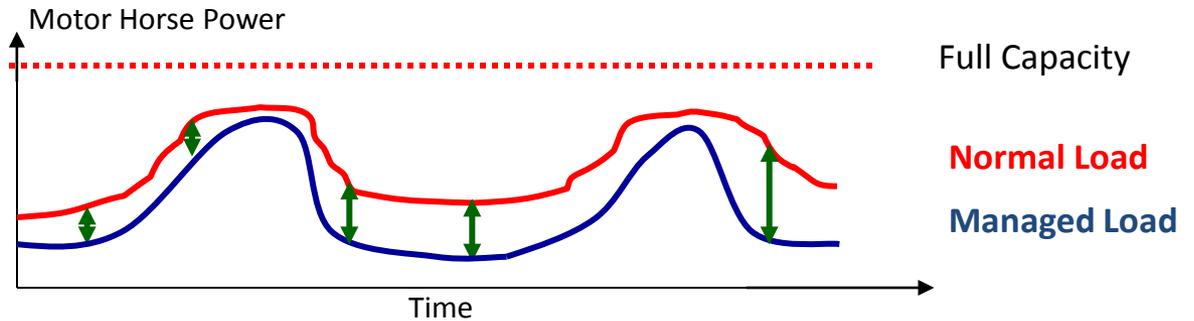
Optimize

- The MotorWise unit reduces the power consumed to the minimum required by the motor to maintain its optimal operation and thus, eliminates energy wasted in the form of heat, noise, and vibration.



How MotorWise Works

How it works...



How it saves...

	Normal Load	Full-Load	Half-Load	Unloaded
Estimated Savings* Managed Load		<u>5%</u>	<u>25%</u>	<u>85%</u>

•Actual savings will depend on motor specs & applications.

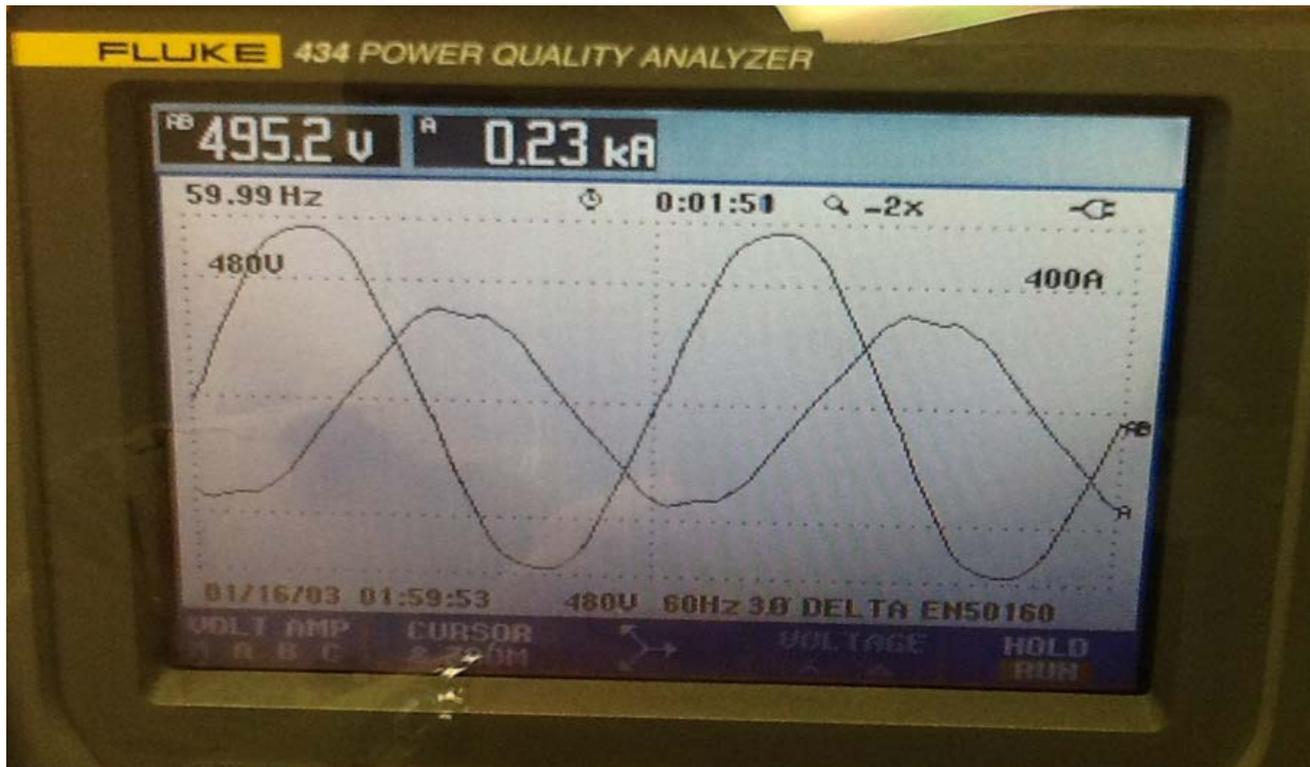
How MotorWise Works

Basic Sinusoidal Wave

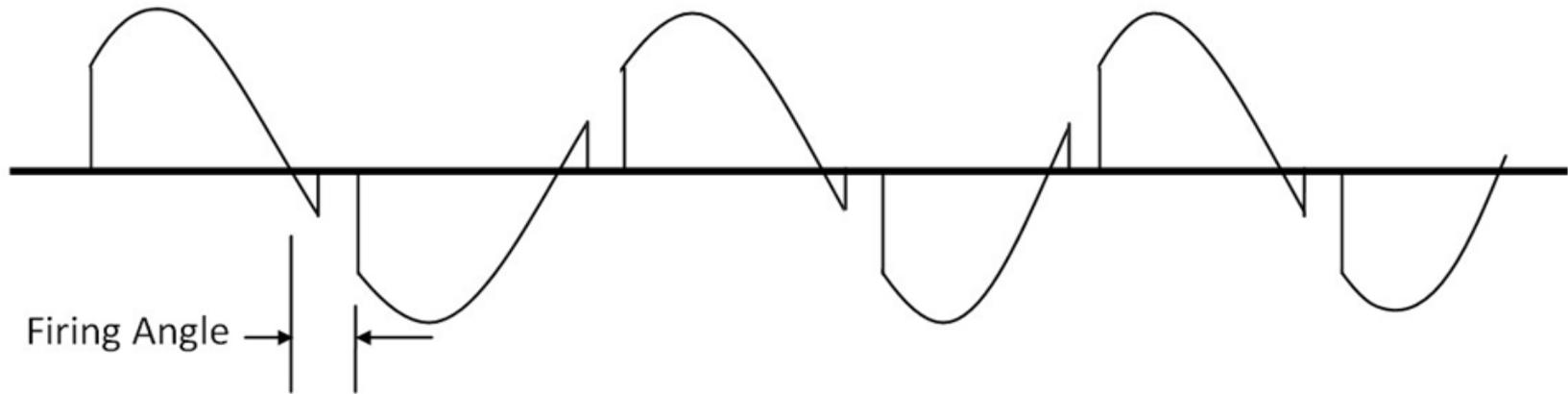
Prior to MotorWise technology being engaged.

The current is the larger wave. The voltage is the smaller wave.

Once MotorWise is engaged the voltage wave will decrease as it is regulated in reference to the system's load at a specific point in time.



How MotorWise Works cont.



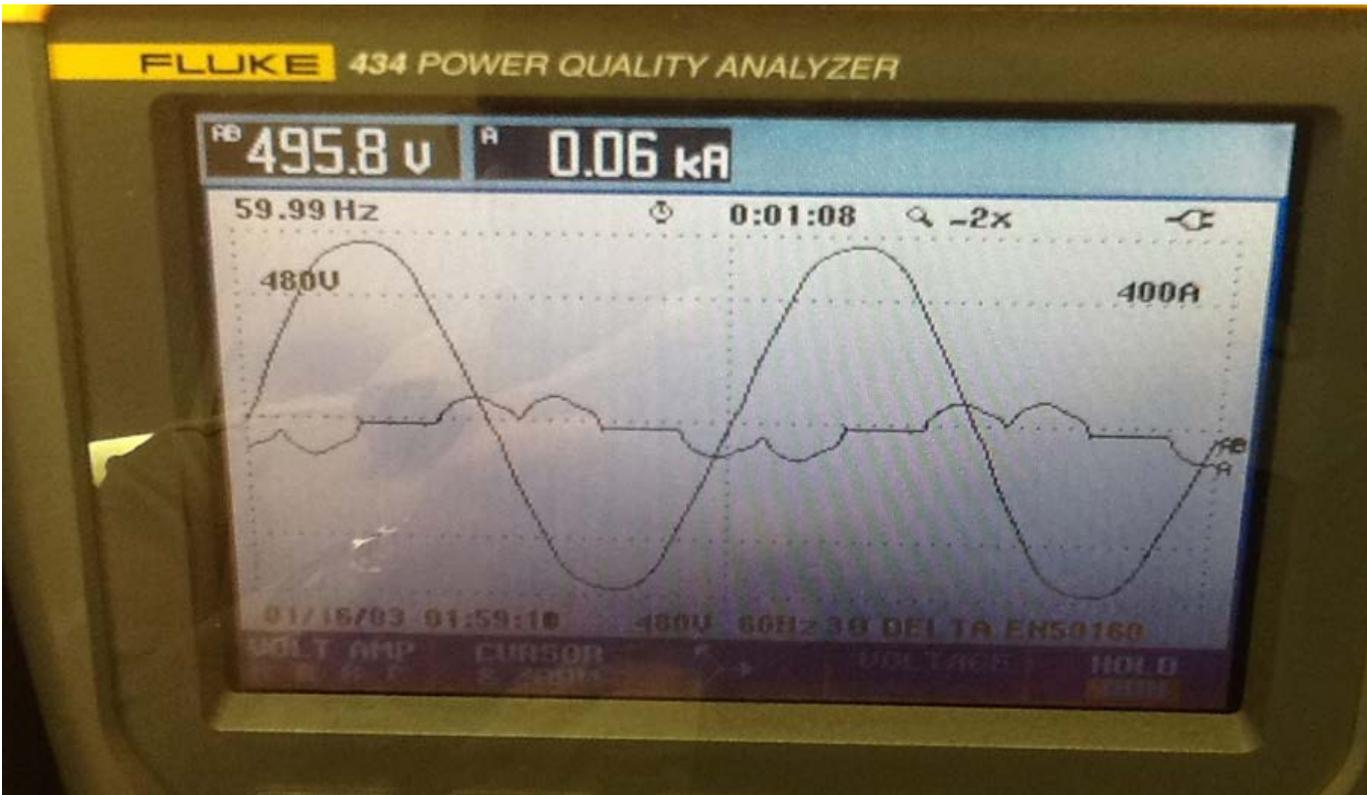
When MotorWise is engaged the AC voltage will be chopped as shown above. The Firing angle is the term used to indicate when the thyristor is “fired” ON. The current is zero prior to each firing angle. **It is during these gaps that the MotorWise technology will save energy.**

How MotorWise Works cont.

MotorWise Managed Sinusoidal Wave

As the voltage is chopped to match the load of the system at each point in time, the current sine wave will be altered.

The result of the decrease in current will enable the system to run more efficiently and to reduce the consumption of energy.



Benefits of MotorWise



Reduces power consumption

- Field averages of 26.84%* energy savings

Reduces operating costs

- Lower utility expense, reduce wear and tear on belts and gears, and extend motor life

Decreases in-rush current and lowers demand charges

- Continuous soft start feature included

*Average based on utility bill readings over a two year period.

MotorWise Testimonial Video



Individual Energy Measurement for Every Unit

- Validation tests are conducted upon installation and calibration of each and every unit.
- The PowerXplorer PX5 Drantez meter is used for the measurement sample.
- Units are measured in a managed mode and an unmanaged mode at the point of calibration
- The kWh are measured and documented in both managed and unmanaged mode while operating the systems during windows of 15 minutes each.
- The savings are calculated by comparing these two measurements.
- The average savings for the 2000+ units installed in the validation testing is 21.76% of energy consumed.



Permian Basin Study #1

- Two (2) year study in the Permian Basin.
- 62 randomly selected wells with MotorWise and individual electric meters.
- Energy consumption normalized to 30 days for entire study.
- Energy consumed prior to MotorWise installation was measured and documented by Sharyland Utilities for a period of 6 to 9 months.
- MotorWise was installed and calibrated. The energy consumed was measured and documented monthly.
- kWh normalized to 30 days was then compared. The “Unmanaged” months versus the “Managed” months.
- Results showed a significant difference of energy consumed between a managed mode and an unmanaged mode.
- A 26.84% decrease in energy consumption was the result after 18 months of follow up with MotorWise.



Permian Basin Study #2

- 24 hours managed vs. 24 hours unmanaged test in the Permian Basin.
- 12 randomly selected wells with MotorWise and individual electric meters
- Utility meter read at a specific time each day. The unit was placed in a managed mode followed by an unmanaged day.
- Results showed a significant difference of energy consumed in a managed mode vs. an unmanaged mode.
- The managed time period with MotorWise demonstrated an average decrease in energy consumed of 25.60%.

Permian Basin Study #3

- Eighteen (18) month study in the Permian Basin.
- 106 randomly selected wells with MotorWise and a primary electric meter.
- Energy consumption normalized to 30 days for entire study.
- Energy consumed prior to MotorWise installation was measured and documented by Xcel Energy for 15 months.
- MotorWise was installed and calibrated. The energy consumed was measured and documented monthly.
- kWh normalized to 30 days was then compared. The “Unmanaged” months versus the “Managed” months. All other loads on the field were factored out.
- Results showed a significant difference of energy consumed in a managed mode vs. an unmanaged mode.
- The months after installation of MotorWise demonstrated an average decrease in energy consumed of 22.02%.

Permian Basin #4 – Validation Test

- Ten (10) week study in the Permian Basin
- Five weeks of “unmanaged” measurements vs. five weeks of “managed” measurements
- Three (3) randomly selected wells with MotorWise and individual electric meters.
- Energy consumption normalized to a daily average for this study.
- Energy consumed prior to MotorWise installation was measured and documented for three weeks by Xcel Energy.
- MotorWise was installed and calibrated. The energy consumed was measured and documented weekly.
- kWh was normalized to a daily average and was then compared.
- Results showed a significant difference of energy consumed in a managed mode vs. an unmanaged mode.
- The weeks after installation of MotorWise demonstrated an average decrease in energy consumed of 17.11%%.
- Original study was validated.

MotorWise – Pricing and ROI

- MotorWise has been field-proven to save over 25% of the energy consumed in a managed mode vs. an unmanaged mode.
- The unit costs are approximately \$2100 installed.
- The ROI could be less than 2 years.**

- MW 30/Gen applicable to all motors that are 30HP or less - \$1850
- MW 60/Gen applicable to all motors that are 60HP or less - \$2500
- MW 100/Gen applicable to all motors that are 100HP or less - \$3500

**There are several factors involved – kWh consumed, rate per kW, run times, depth of well, demand charges, etc...



Economic Impact Analysis

The TechnoWise Group's Economic Impact on Texas Economy

In March 2012, The TechnoWise Group hired AngelouEconomics to measure and analyze the benefits of The TechnoWise Group's energy conservation products (EcoWise® and MotorWise®) on the Texas economy if widespread adoption takes place among residential, commercial, and industrial electricity customers.

The economic impact analysis measures the direct, indirect, and induced effects of the installation of the energy conservation products, as well as the energy savings that are gained by businesses and households in Texas that utilize the EcoWise and MotorWise products, with a focus on how the energy savings translate into positive impacts such as increased capital investment by businesses and a greater amount of discretionary income for households.

Economic Impact Assumptions

Market Size, Energy Savings, and Market Penetration Assumptions

ELECTRICITY CONSUMPTION IN TEXAS BY SECTOR, 2010

SECTOR	2010 ELECTRICITY SALES (MWH)	2010 REVENUE FROM ELECTRICITY SALES
Residential	137,161,402	\$15,905,876,800
Commercial (Includes Retail, Office, Institutional)	121,008,256	\$11,151,016,300
Industrial	94,342,867	\$5,975,916,400
TOTAL	352,512,525	\$33,032,809,500

MARKET SIZE, ENERGY SAVINGS, AND MARKET PENETRATION SCENARIOS

	RESIDENTIAL SECTOR	COMMERCIAL SECTOR	INDUSTRIAL SECTOR
Market Size (% of Electricity Customers That Benefit)*	70%	60%	50%
Annual Market Size (\$)	\$11,134,113,760	\$6,690,609,780	\$2,987,958,200
Average Energy Savings Rate	10%	10%	20%
Annual Energy Savings Under a Theoretical 100% Market Penetration	\$1,113,411,376	\$669,060,978	\$597,591,640
Annual Energy Savings with Low (20%) Market Penetration	\$222,682,275	\$133,812,196	\$119,518,328
Annual Energy Savings with Moderate (40%) Market Penetration	\$445,364,550	\$267,624,391	\$239,036,656
Annual Energy Savings with High (60%) Market Penetration	\$668,046,826	\$401,436,587	\$358,554,984

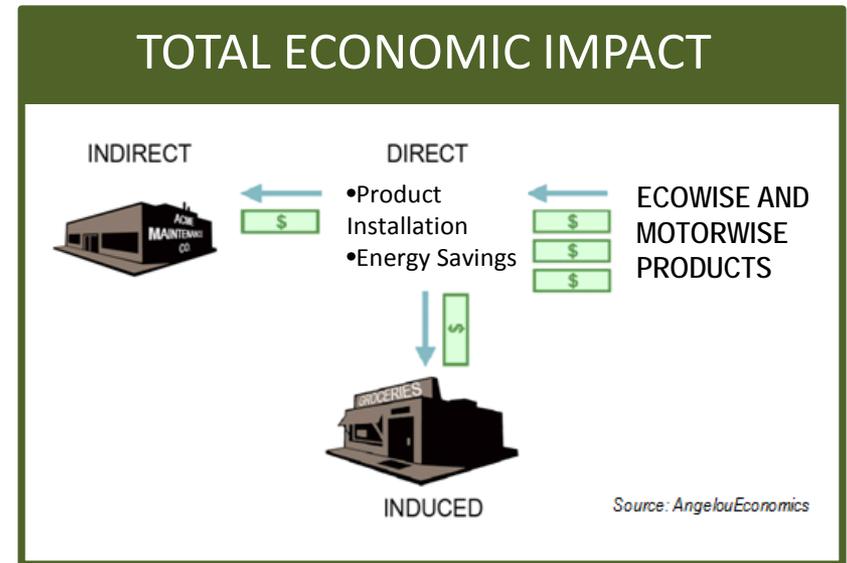
Economic impacts will be calculated for each sector under a low (20%), moderate (40%), and high (60%) market penetration scenario.

* Portion of total electricity consumption within each sector that can potentially use The TechnoWise Group products

Economic Impact Methodology

Direct, Indirect, and Induced Impacts

- **Direct economic impacts:** are limited to spending on the installation of EcoWise and MotorWise products and the energy savings gained by customers that utilize the products.
- **Indirect economic impacts:** include increases in sales, income or jobs in business sectors that support the direct beneficiaries of EcoWise and MotorWise products.
- **Induced economic impacts:** are the household spending of individuals who experience increased earnings as a result of the direct and indirect impacts generated by adoption of the EcoWise and MotorWise products and energy savings generated by the products. This additional income creates a compounding effect, which is called the “multiplier effect”.



EXAMPLES OF DIRECT, INDIRECT, AND INDUCED ECONOMIC IMPACTS

DIRECT	INDIRECT	INDUCED
<ul style="list-style-type: none"> ▪ Installers of EcoWise and MotorWise products ▪ Capital investments on new equipment from industrial and commercial sectors ▪ Spending on retail/restaurants from households 	<ul style="list-style-type: none"> ▪ Suppliers and service providers to installers ▪ Suppliers and business sectors that provide services to producers of new equipment for the industrial and commercial sectors ▪ Suppliers and business sectors that provide services to retail stores and restaurants 	<ul style="list-style-type: none"> ▪ Increased income for businesses and households that benefit from all direct and indirect impacts is spent throughout the Texas economy on a wide range of products and services

Total Economic Impact Over 10 Years

Impact on Jobs, Income, and Total Economic Activity

After developing a complete set of market-based assumptions, economic benefits were measured and analyzed for three scenarios, a **low** market penetration of 20%, a **moderate** market penetration of 40%, and a **high** market penetration of 60%, each over a 10-year period. A summary is shown below.

TOTAL ECONOMIC IMPACT OF TECHNOWISE GROUP ENERGY CONSERVATION PRODUCTS

MARKET PENETRATION LEVEL	IMPACT	DIRECT	INDIRECT	INDUCED	TOTAL
LOW MARKET PENETRATION (2.0% annual market penetration, 20% of total market at Year 10)	Average Annual Jobs	1,668	659	1,034	3,362
	Total Wages and Income	\$942,504,394	\$365,626,386	\$456,528,833	\$1,764,659,613
	TOTAL ECONOMIC ACTIVITY	\$2,653,080,434	\$1,070,491,246	\$1,362,211,246	\$5,085,782,925
MODERATE MARKET PENETRATION (4.0% annual market penetration, 40% of total market at Year 10)	Average Annual Jobs	3,337	1,319	2,068	6,723
	Total Wages and Income	\$1,885,008,787	\$731,252,773	\$913,057,666	\$3,529,319,226
	TOTAL ECONOMIC ACTIVITY	\$5,306,160,867	\$2,140,982,492	\$2,724,422,492	\$10,171,565,851
HIGH MARKET PENETRATION (6.0% annual market penetration, 60% of total market at Year 10)	Average Annual Jobs	5,005	1,978	3,102	10,085
	Total Wages and Income	\$2,827,513,181	\$1,096,879,159	\$1,369,586,499	\$5,293,978,838
	TOTAL ECONOMIC ACTIVITY	\$7,959,241,301	\$3,211,473,738	\$4,086,633,738	\$15,257,348,776

Additional Benefits for Texas

Further Benefits from Adoption of The TechnoWise Group's Products

- Increased life expectancy of household and commercial appliances, as well as machines running on A/C motors.
- Additional energy savings from reduction of “line loss” along electrical transmission lines.
- Greater efficiencies for utility companies.
- Lower carbon footprint for Texas businesses and households.
- Valuable publicity for State of Texas as a leader in sustainability and energy conservation.

MotorWise Testimonial Letters



January 26, 2012

Gentlemen,

Legacy Reserves has an extensive maintenance program for ensuring our pump jacks are properly balanced, the rod strings are correctly designed, and the gear boxes are not overloaded. We also employ the use of pump-off-controllers to ensure our systems are as optimized and efficient as possible. During April of 2010, we decided to test the MotorWise units in an attempt to identify an additional level of well optimization. As a result and after installing and monitoring 187 MotorWise units, I am pleased to report that we have witnessed significant energy savings.

The MotorWise technology has allowed us to benefit from energy savings of 20 percent which translates into a substantial monetary savings on the utility expense.

The MotorWise product line has proven to be very beneficial to Legacy Reserves and it is a technology which we intend to continue utilizing in the future.

Sincerely,



Berry Johnson
Production Superintendent
Legacy Reserves

Legacy Reserves

303 West Wall, Suite 1400 • Midland, Texas 79701 • P.O. Box 10848 • Midland, Texas 79702
OFFICE 432-689-5200 • FAX 432-689-5297

ENDEAVOR ENERGY RESOURCES, L.P.

110 N. Mariefeld, Suite 200
Midland, Texas 79701

December 10, 2011

To whom it may concern,

Endeavor Energy Resources began testing the MotorWise technology during September 2010. As a result of these tests and based on the results, we purchased an initial order 578 units in an effort to conserve energy and decrease one of our largest operating expenses – the utility costs associated with the electricity used to operate our wells.

Our analysis proves that we are saving significant amounts of both consumed and demand energy which consequently translates into proven monetary savings of 25.81% to date as evidenced by 12 months of utility bills. This detailed analysis included all wells serviced by Sharyland Utilities that have an individual meter and had MotorWise units installed, prior to August 1, 2011. The analyzed wells have benefitted from the MotorWise technology for greater than six months without issue or down time and without affecting production.

The TechnoWise Group, which manufactures and distributes the MotorWise product line, has been very responsive and helpful during this process. The MotorWise technology is sound and proven with real demonstrable savings. Endeavor Energy Resources is satisfied with the investment and we are looking forward to identifying other cost saving opportunities with the TechnoWise Group.

Respectfully,



Brad Bates
Petroleum Engineer
Manager: Out of State Properties and Special Projects
Endeavor Energy Resources

THE AMERICAN OIL & GAS REPORTER

JANUARY 2012

The "Better Business" Publication Serving the Exploration / Drilling / Production Industry

New Technologies Optimize Production

By Darryl Boyd
Special Correspondent

Optimizing production economics is always a concern for oil and gas companies, but with robust demand and high activity levels creating upward pricing pressures on all types of equipment and field services, production optimization has become a top priority to maximize revenue streams in both conventional and unconventional fields. Consequently, operators are examining their oil and gas properties to determine how advanced technologies and services can help them improve production performance and better monetize the value of their assets. Equipment manufacturers and service companies are responding by rolling out new technologies in an effort to help operators meet their production goals while minimizing costs and staying ahead of increasingly stringent emissions regulations. Durable technological advances in solids separators and electrical submersible pumps are helping operators get the most out of producing formations. On the surface, innovations are reducing fuel costs, enhancing safety and giving producers the ability to more efficiently maintain equipment on remote production sites to reduce downtime and bolster the bottom line.

Motor Controller

The TechnoWise Group's new MOTORWISE™ motor controller is saving operators 30-35 percent on electricity costs in the field, says Chief Marketing Officer Frank Fernandez. The energy-saving controller is designed for three-phase motors on pumpjacks using wye, delta, and grounded-delta power distribution schemes, he says.

Models are available to accommodate pumpjacks with up to 50-, 60- and 100-horsepower motors.

Pumpjack motors are subject to varying loads throughout a pumping cycle, Fernandez says, noting that MOTORWISE units adjust the amount of electricity to correspond with the load requirement at any given time.

"The controller dynamically monitors

the loading on that electrical motor multiple times for every cycle and weight position of the pumpjack," he states. "It makes decisions on how much energy the motor needs to do the work at each interval. The power the motor receives is matched to the amount of work the motor needs to do. If the motor is doing a lot of work, it gets a lot of energy. If the motor is not doing much work, the level of energy is reduced."

Pumpjack motors commonly operate as generators during a portion of the pumping cycle and supply energy rather than consume it, Fernandez points out. During those portions of each cycle, the controller adapts the power system to compensate for it. Each unit includes a soft start feature that lets the motor transition smoothly from rest to full speed, which reduces mechanical stress on the motor and the pumping equipment, he adds.

"It is difficult to measure the cost from wear on equipment that goes to full start immediately and is subject to that immediate stress, but the difference of the impact from a soft start feature is very pronounced," Fernandez says. "If a company invests \$1 million a year replacing belts, for example, a 20-50 percent reduction in expense would be substantial."

The controller also reduces the high-demand penalty cost charged by utility companies. By regulating the power as needed, motor life is extended because the equipment runs cooler overall, he notes. "The life expectancy of the electric motor is reduced with each degree of temperature rise," points out Fernandez. "It could very well extend the life of a motor by 50 to 75 percent."

The MOTORWISE control includes



The MOTORWISE™ controller from the TechnoWise Group is designed to reduce electricity costs by monitoring pumpjack loading and automatically adjust the amount of electricity supplied to the motor based on specific load requirements at any given point in the cycle.

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BASIN OIL

Midland Express, Delgado | www.basinoil.com | Weekly October 21, 2012 | Page 27

Midland College
OPERATION IMPROVEMENTS
INCREASE ELECTRIC EFFICIENCY
To optimize and fine-tune electrical loads in the Midland Basin, Texas, Midland College is installing MotorWise™ motor controllers on its pumpjacks.

Approximate
Midland Basin (Midland College) with 100-HP motors
Midland Basin (Midland College) with 50-HP motors
Midland Basin (Midland College) with 25-HP motors

Midland College P100, 40% Savings
Midland College P100, 40% Savings
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Now ready for general release after three years of field testing in the Permian Basin, MotorWise technology, according to company president David Clinton, could save producers 20-25 percent in electrical costs on basin pumpjacks.

Motorwise expects clients to save up to 25 percent off pumpjack electric costs

By Paul Williams
Special to the Oil Report

Three years of testing on pumpjacks in the Permian Basin has led MotorWise President David Clinton to announce that the company's power-saving technology is ready for the Mid Basin. Clinton states that the company's power-saving technology is ready for the Mid Basin. Clinton states that the company's power-saving technology is ready for the Mid Basin.

"These results come from the power company," Clinton stated. "There were no costs involved in installing motor and pumping the electric bills with and without the technology in operation. Clinton said the company has put the technology on over 1,000 three wells over the last three years."

"The greatest benefit for MotorWise is the long list of production — all from one company — whose promise of power savings were greater than their ability to deliver. Other potential technologies provided savings of 10-15 percent over time. A percent. One, based on physics, has been thoroughly tested for three years and proven to provide savings of 20-25 percent, up to 30 percent, in real dollar savings," Clinton said.

"The test is programmed to monitor the applied voltage and the current consumed by a motor and to adjust the incoming power to a level that closely matches the load. Clinton explained that the "right amount" of the load reduces power consumption.

Another source of savings is in being gentle to the work. When the pumpjack is on the downstroke, it does not need any resistance from the motor. The MotorWise unit detects this cycle and some of the motor for a few milliseconds, starting it back up when the upstroke. Over the course of days and weeks from oilfield work will up.

"Clinton added that the constant monitoring of the motor is mitigated by the unit's soft start feature, allowing the motor to ramp from rest to full speed in a controlled fashion. This reduces mechanical stress on the motor and associated equipment. It noted that the soft start feature was by accident, because of the soft start feature and because of the power consumption reduction brought about by wye and grounded-delta.

The motorwise approach itself has as its core a follow-up of a patent, which Clinton called a "semiconductor" technology for a motor controller.

One will be required for each motor, and Clinton said that the unit is designed to be installed in the motor's control box. The newly conceptual three-year testing phase was completed by five years of 2012. "This was very convenient that we make sure that the product worked as intended and before we were in market with it," Clinton noted. "The real value is to slow to market that come out with something that is not perfect."

The Permian Basin now shows the best results because of the implementation of wye and grounded-delta power distribution.

power to now located in San Antonio, they are well situated to move into that area as well. Clinton said they plan to look outside while and worldwide for markets to sell. Currently employing 60 people, the motor will grow an exponential rate.

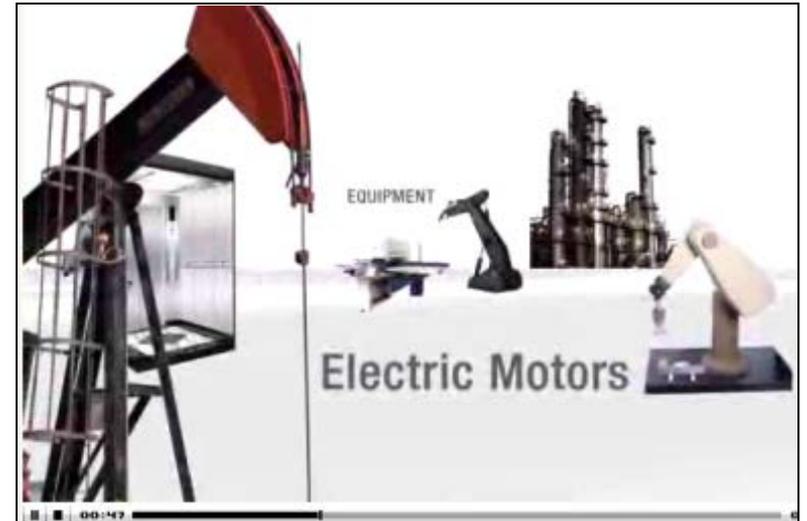
MotorWise has a view that is larger than just individual power bills. Clinton has spoken with power company executives who indicated the unit's power savings because the unit's efficiency increases as ability to be installed into over the next few years. The unit's production growth and the range of oil production have produced power consumption. Better than new plants can be built. "This is a great opportunity for oil companies to go green and actually save money while the spending boom," Clinton said, adding that a trial on MotorWise will pay for itself in 2012 months.

The TechnoWise Group, of which MotorWise is a part, is also setting up a sales office in Dallas that is expected to be in the market for oil production. In work, said Clinton, MotorWise technology will work for any industrial motor application. The team needs are being tested in Houston and may become available later this year in San Antonio.

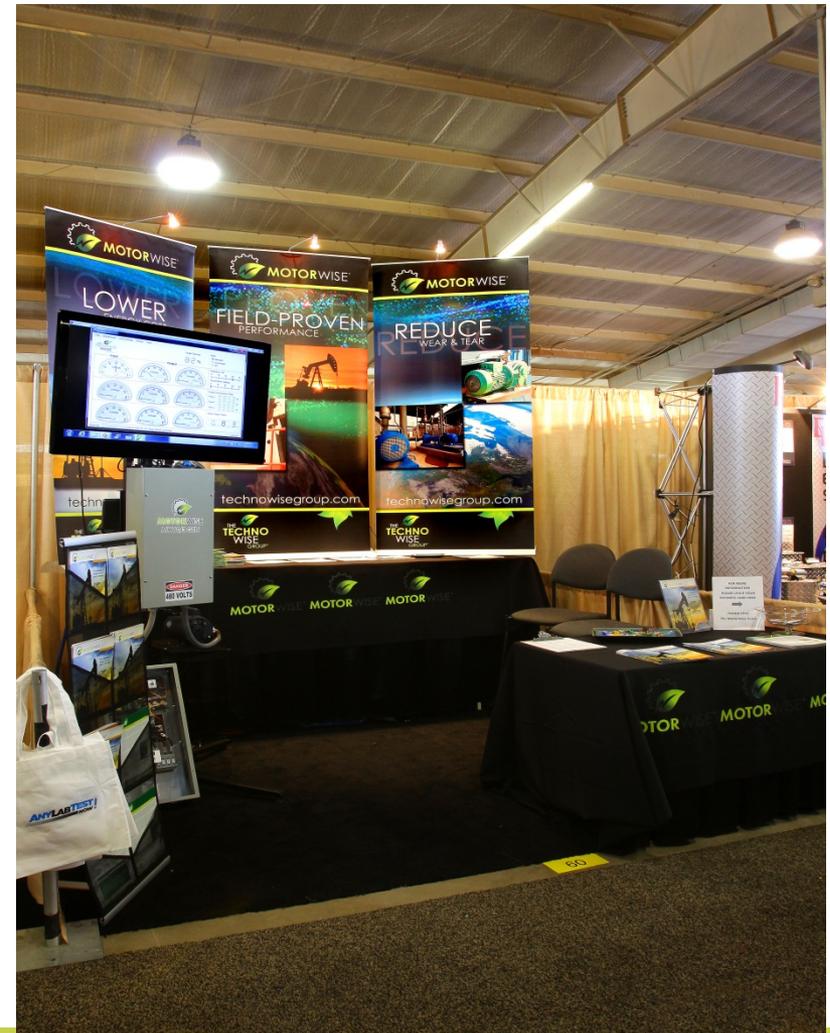
Paul Williams can be reached at pwilliams@basinoil.com.

On the Web: MotorWise is part of the TechnoWise Group. Learn more about MotorWise at www.technowisegroup.com.

MotorWise Videos



MotorWise PBIOS Trade Show Display



Permian Basin Texas

Midland, Odessa and Big Spring



Permian Basin Boom

- Number of working rigs: **442**
- Drilling permits issued this year: **5,657**
- June oil production: **25 million barrels**
- Value of June oil production: **\$2 billion**
- Number of oil field jobs: **24,357**
- Unemployment rate for Midland-Odessa: **4.6%**
- Increase in retail sales (From Jan. to June): **16.8%**
- Increase in lodging receipts (From Jan. to June): **60.6%**
- Dollar increase in vehicle car sales (From Jan. to June): **38.0%**

