

Case: Riecor Farming

Drives help save labor and reduce energy use by 40%





Before using the drives, the irrigation system needed to be started manually and was very time consuming.



Frequent power outages and voltage dips would mean the irrigation system needed to be manually restarted.

40% energy savings and less work

Customer benefits	
Big energy savings	40 percent reduction in energy consumption gave rapid seven-month payback
Reduced labor costs	Manpower needed for startup process is dramatically reduced
Smoother operation	Power drops handled easier, filling smoother, water hammer and system shocks eliminated

Increasing demand for electricity in South Africa has meant that for the past three or four years electricity prices have increased for consumers and commercial users by more than 20 percent per year. At Riecor Farming one of the biggest operating expenses is its irrigation system.

To reduce electricity consumption and system complications, the farm owner began looking for alternatives to the old irrigation system, which worked by running the water pumps at constant speed, with control then being done by manual opening and closing of valves in the pipelines. The system still worked, but it was certainly not energy efficient.

In addition, the need for manual opening and closing of valves during startup combined with frequent power outages and voltage dips from the electrical utility, made the whole process very labor-intensive. To start one of the six pumping stations could take one person up to an hour and with sometimes as many as three power outages a day, startups became almost a full-time job.

The young owner at Riecor, Mr. Tiaan Riekert was not previously a customer of ABB, but upon meeting with ABB South Africa's energy efficiency engineers he decided to test variable speed drives (VSD) on the water pumps at one of its six pumping stations. ABB recommended a drive and working with

a system integrator, assisted in the design, installation and commissioning of five VSDs running irrigation pumps with 45 to 75 kW motors, and the sixth VSD used on the water transfer pump.

The results were quite dramatic. With the new VSD units installed Riecor saw a significant drop in electric energy use. Demand from the irrigation system went from 291 kW, 308 kVA down to only 175 kW, 186 kVA. This amounted to 116 kW or an impressive 40 percent reduction in electric consumption for just one pumping station.

In financial terms, based on the local crop factor for this region that indicates the irrigation pumps would operate at 2,970 hours per year means an annual savings of \$19,700 USD in electricity costs. The payback time amounted to a short 7 months. The farm quickly made a repeat order and has installed similar drives on a second pumping station

Major side benefits

In addition to the financial savings on the electricity bill, the farm also had further operational savings in both man-hours and trouble during the startup process. Operators now only need to flick a switch to start, and in the event of power interruptions the system would startup automatically at pre-set times.



The drives were installed close to the pump's motors and configured to automatically restart when needed. This reduced the manpower required to operate the irrigation system.



Reusing the existing motors, the investment in drives pays for itself in seven months from the 40 percent energy savings alone.

The VSDs give a long ramp-up time that allows for a very smooth pipe filling process, so the previous mechanical stresses on the pump couplings during startup were completely eliminated, together with fewer friction losses in the pipes. Additionally water hammering following switching off disappeared and fewer losses on the impeller were seen due to these extended ramp-up and ramp-down times.

Reduced costs, work and headaches

The ABB South Africa Energy Efficiency engineers who worked on the project, say that the Riecor Farming installation is a good example of how energy efficiency projects give additional benefits on the operational side.

Cost efficient retrofit

- 40 percent reduction in energy consumption gave rapid seven-month payback
- Reduced labor costs, manpower needed for startup process is dramatically reduced
- Smoother operation and pipe filling, power drops handled easier, water hammer and system shocks eliminated



Riecor Farming	
1,645	Total hectares
700	Hectares irrigated
<p>The Riecor Farm, located in the North West Province of South Africa, close to Thabazimbi. They grow different types of crops including corn, wheat and different types of beans.</p>	

Verified results

The figures for energy savings have been measured and verified by a local university. Our application knowledge combined with the VSD products' superiority including features like the patented swinging choke, built-in EMC filter and intuitive control panel made it the right solution. The clients decision to place a repeat order has confirmed this.

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