

No more wrenches!

Variable frequency drive pumps have been around for about a decade but are just now finding their way onto the golf course.

BY
KEVIN KNIGHT

Weston Hills Country Club opened in Fort Lauderdale Oct.

1. Although this spectacular development designed by Robert Trent Jones, Jr. has many unique features, it is the course's pump system that truly breaks new ground in Florida. Its variable frequency drive system uses less energy than conventional systems, usually eliminates water hammer and can potentially reduce course maintenance.

Superintendent Bob Drake was unsure about VFD technology, even though it has been used on Texas and California courses for several years.

"I didn't have any experience with VFD technology before this," said Drake, who has been working in the industry for 22 years.

"I was skeptical because it was a new animal and

because we have so much lightning which I thought could hurt the system's computer controls."

Since installation in the summer of 1989, however, Drake's system has "... run like a champ," he said. "We haven't had any problems so far. The protection they have these days for electronics is much better than what we used to have. And changing performance now is a piece of cake. In the past we changed (pilot valves) with a wrench. Now we make changes on the computer. No more wrenches!"

Another superintendent impressed with this new technology is Dan Jones, who has been with Banyan GC in West Palm Beach for 11 years.

"We're in the process of changing our irrigation system and pump station," he said. "I'm looking for a 25- to 30-year investment so I want to get the most for the club's money. The more I read about VFD the



When Gator Creek Superintendent Mark Todd checks his VFD pump system, he reads the digital screen on his operator interface device (OID) and easily scrolls through complete diagnostic and historical information stored in the system.



Most VFD pump systems use programmable logic controllers to store and manage information. The PLC above stores 165 pages of powerful computer code and can do the work of 99 conventional timers and 372 relays, such as those at bottom right of photo.

more I liked it. We decided to recommend it to our board of directors for several reasons.

"First, it saves power. We figure the system will pay for itself in six to seven years

just on electrical savings.

"Second, there's no (pressure regulating) valve in the system. It's all variable speed so the pump will deliver what you need very precisely. That prevents water surges so we

won't have pipes blowing out. Broken pipes cause a mess, they're inconvenient to members, it takes labor to fix them, they're an eyesore and you can't water the course when one is busted.

"If you add those savings in, there's no telling how quickly this thing will pay for itself."

According to John Swindle, a Tampa-based sales engineer for Flowtronex International which produced and installed the Weston Hills pump station and several others in Florida, VFD technology combines the dependability of conventional systems with the benefits of computer controls.

"VFD systems are really only new to the golf course industry. We've spent more than eight years making them for industrial applications and installing them in really harsh environments like the California desert and northern Alaska. In fact, worldwide, there are more than 100,000 VFD installations," said Swindle.

"The easiest way to picture the difference between conventional pump systems using pressure-regulating valves and VFD systems

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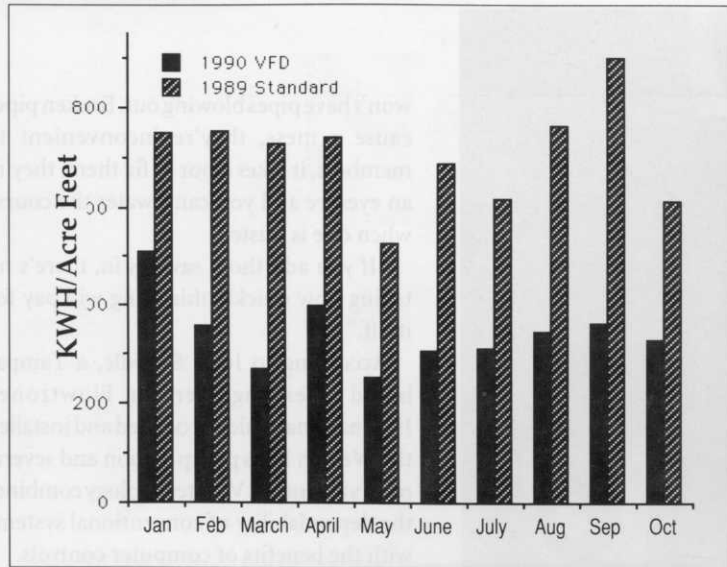
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Since switching from a conventional pump to a VFD system in 1989, energy savings averaging 52 percent have been recorded by Ed St. George of Sunrise CC in Rancho Mirage, Calif. This chart compares the amount of energy required to pump an acre foot.

down is to hit the brakes or kill the engine. Imagine what that means with a pump system. Any decrease in water pressure must occur at the control valve which acts like a set of brakes and wastes energy. Some systems use extra pumps and motors but they can cycle on and off, decreasing their useful

with computer controls is to think of cars.

“A conventional system is like a car without a gas pedal. The motor either runs full bore or it’s turned off. The only way the driver can slow

lives.

“VFD systems, on the other hand, are like cars with cruise control. Computers and powerful software gradually speed things up or slow them down. Energy isn’t wasted slamming water against a valve. In fact, VFD systems don’t even have pressure-regulating valves. Water hammer is nearly eliminated because these systems have a ‘soft run’ feature which prevents sudden changes in speed.

According to Swindle, whose company also makes conventional systems, you can even hear the difference. “Stand in one pump house with a conventional system and one with a VFD system. When a conventional system kicks on, it goes right to full speed. Sometimes you’ll even hear motors cycling on and off. With VFD, it’s like cats’ purring because the motors and pumps gradually change speed.”

Because VFD technology is so new to the Florida market, very little data on cost

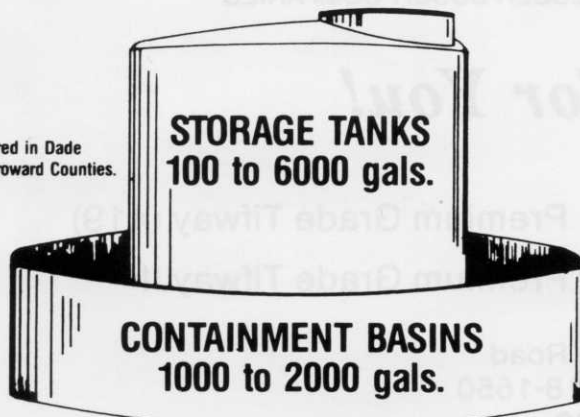
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savings is available locally. However, several managers and superintendents in California have tracked the performance of their VFD systems for years. Ed St. George has perhaps maintained one of the most detailed reports as manager of Sunrise CC near Palm Springs, Calif.

"Until we installed a VFD system in the summer of 1989, we had a conventional station with three 75-horsepower motors and a 40-horse jockey pump," he said. "Rather than repairing it, we elected to get a new system with the same size motors."

"My file for June 30, 1990, for instance, shows a 55-percent saving in energy costs. That's a cost saving of \$4,000 per month. Right now we're looking at a two-year payback and so far we haven't had any problems with the system."

Perhaps the biggest concern about VFD systems is service. Technicians and maintenance personnel familiar with conventional stations generally hesitate touching the controls on a VFD system. According to Flowtronex's Swindle, however, that shouldn't be a concern since service is always available within 24 hours.

"Properly designed VFD systems with solid-state electronics rarely go down. But if they do, automatic backup systems should keep things running until the problem's corrected," he said. "Many of these systems can actually be diagnosed over phone lines using computer modems. Technicians on the other end can check the computer memory, determine what caused the problem and quickly correct it by making

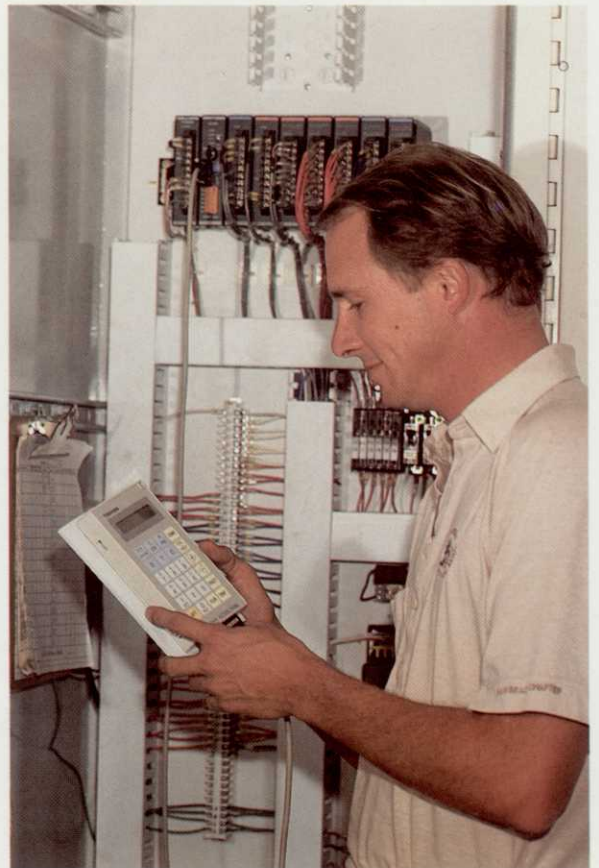
some software changes."

Although no service calls have been needed since a VFD system was installed at Gator Creek CC in Sarasota this past July, superintendent Mark Todd is interested in seeing how it continues performing.

"I'm very pleased with it so far," said Todd, who graduated from the Lake City Community College golf course management program and is a 10-year industry veteran. "It has let us maintain lower line pressures (60 psi constant pressure) and reduce irrigation breaks. I think this is going to be the way to go in the future. We're getting tighter restrictions on water use and utilities are looking at us to be more efficient."

Those thoughts were echoed by superintendent Larry Livingston who originally suggested using VFD technology at Gator Creek before moving to River Hills CC in Palo Rito.

"Each golf course and situation is different but in the circumstances at Gator Creek and most other courses, I believe that VFD is the way to go. One of the things that gave me a lot of confidence is that they're using them in a lot of municipalities. I've got a friend in the utilities business and he says it's all they use and they don't have any



Weston Hills Superintendent Bob Drake uses his handheld OID to "see" inside his VFD pump system.

problems with them."

For a growing number of golf course professionals in Florida and other states, it seems that VFD technology can help them remain competitive while reducing a variety of costs and maintenance headaches.

Kevin Knight is a publicist based in Dallas, Tex.



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