

# SHOP TALK

*From the Physical Plant Division of the University of Florida*  
*www.ppd.ufl.edu*

**UF** UNIVERSITY of  
**FLORIDA**

## **Mission Statement:**

*We create and maintain facilities for the university community.*

## **Chiller Plant Optimization Helps Cut UF Electric Bill**

Gainesville is legendary for its summer and early fall heat waves – rising temperatures cause electric bills to skyrocket with increased air-conditioning costs. In an effort to slash rising energy costs, Physical Plant has begun a program to optimize its campus chiller plants for peak efficiency.

“Last year, my budget (for chilled water) was eight million dollars,” said Maintenance Specialist Charlie Milford. “This campus has the largest demand for air conditioning of any university in the southern United States.”

Chilled water has long been established as the best way to deliver air-conditioning in mass quantities to large buildings and institutions. The University of Florida’s system relies on chiller plants and cooling towers to create chilled water. At each of the eight plants on campus, water flows into chillers in a cooling loop, and is cooled to 44 degrees Fahrenheit, using Freon. This chilled water is then piped out to campus buildings for air handler units to



**Charlie Milford checks a rack of sensors in the Southeast chiller plant. The sensors control fan speed in the plant’s cooling towers.**

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## **Natural Disaster Preparation: Generator Project At Gator Corner Dining**

Hurricanes are a constant threat in Florida, and the past few years have seen several very tough storms come through the Sunshine State. After witnessing the destruction caused by those hurricanes, as well as the massive devastation in the Gulf Coast region left in the wake of Hurricane Katrina, UF Director of Building Services James Morgan had seen enough to convince him that additional preparations were needed in the event of another major natural disaster.

“After Katrina caused so much damage, Louisiana State University was called upon to use their facilities to support evacuees from New Orleans and the surrounding areas,” said Morgan. “If we had an extended loss of power, the University of Florida doesn’t have any dining facilities that can sustain operations for longer than a few days. We would have a hard time supporting police or National Guard troops, let alone our students or refugees from disaster areas. I began looking at ways that we could ensure that our largest dining facility, Gator Corner, could be kept operational even with major power outages at the University.”

To that end, Morgan got approval from Vice President of Finance and Administration Ed Poppell to contact Physical Plant about the possibility of installing a generator at Gator Corner. He wanted a unit that could power the entire facility, at a reasonable cost. In addition, the unit had to be reliable enough to work after long periods of inactivity, and blend in aesthetically with the building’s exterior. “My hope was that we should be able to feed people in a comfortable, air-conditioned environment,” said Morgan. “If Gator Corner were used as a shelter for refugees, I wanted to be able to provide them with some semblance of normality and comfort.”

PPD Project Manager Mike Richarme said, “I was called in to discuss the project because of my background in electrical

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# PPD Motor Pool Introduces Alternative Fuel

From mid-May through the end of June this year, Physical Plant's Motor Pool Department has been conducting a trial of the alternative fuel bio-diesel. The fuel has been used in a pair of vehicles used by PPD Grounds – a 2000 Dodge fullsize pickup truck, and a John Deere industrial riding lawnmower.



**Paul Dennis refuels his bio-diesel-powered Dodge truck from a special tank at Physical Plant's Motor Pool.**

"The fuel we have been using is manufactured from vegetable oil," explained Auto/Equipment Maintenance Superintendent Jon Priest. "There are a lot of different types of vegetable ingredients in it – I think the best way for me to describe it is as waste fry oil, from restaurants and fast food establishments."

The vegetable-derived alternative fuel is a much cleaner-burning fuel than traditional fossil fuels. "We've all seen the black clouds of smoke from 18-wheel trucks accelerating," says Priest. "Those clouds are particle emissions from the fuel burning. With bio-diesel, you get a hugely reduced amount of particle emissions and a lot less waste being introduced into the atmosphere."

Neither vehicle required special modifications to their engines in order to run on the alternative fuel. Although bio-diesel is rated to produce slightly lower performance standards than regular diesel fuel, Priest says that the miles per gallon are almost exactly the same. And according to vehicle operators participating in the study, the difference in power is

negligible.

"It really surprised me," said Assistant Lands/Grounds Superintendent Paul Dennis, who operates the Dodge pickup. "I was expecting there to be some kind of drop-off in performance when I stepped on the gas. But from what I've experienced, this stuff runs as well or better than regular old diesel fuel."

With such positive results coming back from the trial period, PPD Motor Pool plans to start using a 20/80% blend of bio-diesel and regular diesel fuel for all diesel-powered vehicles on campus. Although the selected vehicles ran on 100% bio-diesel during the trial period, that's not currently feasible in the long-term, according to Jon Priest.

"At the moment, there are disclaimers from the major diesel engine manufacturers that while their engines will run on bio-diesel, they do not recommend using more than 20% of alternative fuel in the mixture," he explained. "Using a higher percentage will invalidate our warranties on these engines, and that's a risk we don't want to take right now. However, even using the 20% blend will severely reduce emissions from diesel-burning vehicles on campus, and as the technology behind bio-diesel improves, we can work towards using higher percentages in our fuel mix."

Priest concluded, "Overall, this trial has been flawless – we've had no issues or complaints from our operators, and the vehicles have been running perfectly. I'm very pleased with the results, and we look forward to increasing campus sustainability and air quality, and reducing dependence on fossil fuels by using the bio-diesel mixture."

However, Paul Dennis did admit that the alternative fuel has one small flaw. "Every time I step on the accelerator, it smells like I'm cooking French fries back there," he said. "Bio-diesel is a great alternative to regular diesel, but it definitely does get your stomach rumbling all the time!"

## Physical Plant To Hold Open House

Physical Plant Division is planning to hold an Open House event in mid-October, 2006. The event will give our customers and campus personnel a chance to get an up-close, detailed view of our facilities, employees and processes.

Events being considered as part of the Open House include walkthroughs of PPD's CoGen and Wastewater Plants, presentations on PPD services, and tours of the Health Center and other facilities.

If you would like to attend Physical Plant's Open House, please send an email to [PPDOpenHouse@admin.ufl.edu](mailto:PPDOpenHouse@admin.ufl.edu) with your name and college or department. This will register you for the event. For more information, you may also visit [www.ppd.ufl.edu](http://www.ppd.ufl.edu).

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engineering – I’ve been in the business since 1979, so I have quite a bit of experience. After consulting with Mr. Morgan, I decided that the best course of action would be to install a 600 kilowatt generator.”

The generator is being installed along the east side of Gator Corner, on a specially-built concrete pad. Richarme said, “This unit will be able to run every electrical system inside the facility in the event of a major loss of power. Hurricane Katrina has alerted people to the fact that disaster planning is important, and Mr. Morgan stepped up to the plate and got the ball rolling on a plan for UF and its dining facilities.”

James Morgan added, “I wanted to be prepared to be able to lend our support in times of need, not just to the university, but to the community as a whole, and even beyond that to refugees from all across North and West Florida. It is probably a long shot that we would experience Katrina-level devastation here in Gainesville, but the possibility is much more real for many of our neighbors, and I feel we are ready to handle that possibility. We may never use this generator, but if the occasion ever arises I think we will be extremely thankful that we have it in place.”

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## CHILLERS Cont. From Pg. 1

create A/C.

A separate water loop flows into the chillers at 80 degrees, and receives the collected heat discharge from the cooling loop. The heated water, now around 90 degrees, is then pumped outside the building and up into the cooling towers. The towers are filled with ceramic tiles – as the heated water flows over the tiles, fans blow air across it and cool it back down to 80 degrees. The water can then flow back through the chiller for another load of heat and the process begins all over again.

“Campus wide, we have more than 40,000 tons of chilled water capacity,” said Senior Engineer Gray Rawls. “A typical chiller in our plants is anywhere between 1200-1700 tons capacity. What we’re trying to do is to continue to strive to create better efficiency in our plants, through software upgrades, automation, and more efficient equipment. We feel that our chiller plants operate at a very high level of efficiency already – but by automating our processes even more, we can squeeze that last extra 10-15% of efficiency out of them.”

Milford said, “Everything we’re doing is working towards being as energy efficient as possible. Last year, we got all our chiller plants online centrally, where operators in each plant can check processes at the other plants by remote computer. Currently, we’re testing software at our Southeast chiller plant that allows all our processes to be automated and run by computer – it checks the conditions multiple times every hour and adjusts settings accordingly to maximize efficiency. The computer can bring chillers online and offline as needed to handle increased or decreased demand for A/C on campus. Also, recently we upgraded the fans in the towers at the Southeast plant to variable speed drives, from the old two-speed drives – this allows the computer to run the fans at any speed and minimize the amps they’re pulling.”

As PPD’s newest chiller plant, the Southeast plant was chosen to test the automated software and new fans. “This plant was built in ’97,” said Utilities Superintendent Johnny Miller, “and it has four 1200-ton chillers. The computer program we’re running here is able to process and use a lot more information when making adjustments to the chiller loads than a human operator. We’re already seeing a difference in operation. For example, during times when there’s less demand for A/C, a plant operator would probably run three of the chillers at 100% and keep one of them idle to save energy. The computer, on the other hand, looks at the same situation and runs all four chillers at, say, 87% - it processes all variables in real-time and figures the optimum load on each chiller in order to conserve the most energy and run as efficiently as possible.”

At PPD’s Heat Plant II, off Mowry Drive, Senior HVAC Operator John Clark works in a control room, checking monitors and recording data. “I can monitor all our plants every hour from this control room, and log the chiller loads and fan speed,” he says. “We can use that data to find out our peak load times and tweak our systems accordingly.”

“We’re also using the data we gather at the Southeast plant to check this year’s energy consumption levels with last year’s,” Miller said. “So far, everything looks good. The new fans and software are producing more efficient loads on the chillers. Once the test period at the Southeast plant is done, we’ll begin installing these equipment upgrades in our other plants, beginning with the Weil and Walker plants.”

“We’ll always need human operators at our plants,” Charlie Milford added. “The computer can’t go out on-site and check for leaks or make sure the water pressure is correct. But with our new systems and new equipment, we can optimize our processes and squeeze every last bit of efficiency out of our chilled water system.”



***The Southeast chiller plant's cooling towers have been fitted with variable speed fans to help save energy.***

## PPD Works With Football Team And Fraternities For Tree-Planting Event

UF PPD recently teamed up with the Florida Gators football team and the InterFraternity Council in a campus-wide tree planting effort in April 2006. The event was the second of its kind in two years, following a similar effort last year.

This promises to be an annual tradition at UF following the Orange and Blue spring football game. Fred Gratto, Assistant Director at UF Physical Plant Grounds Department, said, “(Head Football Coach) Urban Meyer puts a very big emphasis on building relationships between the football team and UF students, as well as the local community in general, and this was an idea he had come up with along those lines. The plan was to have the losing team from the Orange and Blue game team up with students and PPD employees for a campus beautification project.”

Physical Plant provided the trees and scouted out planting locations

for the project, as well as overseeing and assisting with the actual planting. Gratto said that the final locations, such as the parking lots around the College of Law, the parking garages at Shands Hospital, and the east side of the UF Soccer Field, were chosen mainly for aesthetic reasons.

Over 325 trees in all were planted, including such species as American hollies, Japanese maples, live oaks, river birch, and crape myrtles. The trees were selected from the PPD nursery off Radio Road, where they had been grown to planting maturity from seedlings.



**Fraternity members Trey Bice (left) and Jack Sampson working on the north side of the softball stadium.**



**UF head football coach Urban Meyer (left) and UF defensive back Reggie Nelson planting trees near the Levin College of Law.**

“The idea here was to do something substantial, something that will stand the test of time,” said Gratto. “There’s always a need for trees on campus, and now, when these students come back to the University in twenty years, they can point to these trees and say, ‘I helped plant those, many years ago.’”