



ENERGY TO CARE *SUCCESS STORY*

UF HEALTH SHANDS VISTA REHAB & UF HEALTH SHANDS CANCER HOSPITAL (SOUTH TOWER)

UF Shands uses commissioning and automation to save more than \$5 million in less than five years

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UF HEALTH

Academic Health System

Location: Gainesville, Florida | **Square Footage:** 3 million total | **Maintenance Staff:** 60

- Cancer Hospital (South Tower) = 500,000 square feet
- Vista Rehab = 85,000 square feet
- 852 licensed beds

Team:

- Mark Dykes, Energy Projects Manager
- Brad Pollitt, Vice President of Facilities

Overview

In 2015, the American Society for Healthcare Engineering (ASHE) of the American Hospital Association recognized 23 medical facilities nationwide for significantly cutting energy consumption. The UF Health facilities Vista Rehab and Cancer Hospital (South Tower) both received this notable recognition. Each facility received an ASHE Energy to Care Award for its work to slash energy use, reduce operational costs, and free up more resources for patient care.

In 2009, UF Health, which totals three million square feet and a 60-person maintenance staff, began looking at the utility consumption of their buildings to identify any opportunities for utility savings. Located in Gainesville, Fla., UF Health experiences extreme humidity, which creates HVAC challenges. Additionally, the region regularly experiences substantial temperature fluctuations, creating an even greater challenge in keeping a building under control while striving for energy efficiency and cost savings.

UF Health's story of successful energy reduction starts prior to these two facilities receiving the spotlight. UF Health Energy Projects Manager Mark Dykes first eyed the Florida Surgical Center—he thought he could save some money by more accurately monitoring the mechanical systems. “The computer was telling us what was happening, but what if WE could tell IT what to do?,” asked Dykes.

The Florida Surgical Center was actually the first building into which UF Health had installed a complete automation system. They now had an opportunity to put this new tool to the test. A couple of weeks of reprogramming and tweaking the performance of the mechanical systems (at virtually no cost) created a substantial savings of approximately 25 percent the first month! Since then, Dykes and his team have not stopped searching for opportunities to reduce energy consumption.

UF Health knew building automation would facilitate ways to program building performance to optimize air flow by ramping the fan systems up and down based on building demand. After implementing the airflow reduction strategy with Florida Surgical Center, UF Health confirmed the effectiveness by tracking the savings in the utility bills. This success inspired the facilities team to look into other buildings, including Vista Rehab and the South Tower Cancer Hospital. Vista Rehab, an older facility among the UF Health fleet, was primarily a retrocommissioning project, while the three-year-old South Tower Cancer Hospital focused on continuous optimization.

Objectives

The overall objective was simple—create efficient, high-performing buildings and save money on the resulting utility reductions. As Dykes said, “As you optimize a building, a new revenue stream is created from the savings. This additional funding becomes available to fund further optimization, in addition to patient care. Thus, we can connect saving energy to saving more lives. That’s powerful.”

The specific objectives included the following:

VISTA REHAB

Save \$30,000 and neutralize the 14 percent increase in utility costs.

SOUTH TOWER CANCER HOSPITAL

Although no specific energy savings goal was set, the potential savings through optimization were substantial, given the size of the facility and automation system.



Solutions

To start benchmarking energy performance, UF Health hired a consultant to input all UF Health facilities into ENERGY STAR Portfolio Manager® (ESPM). The total consulting cost to gather and input the data into ESPM for eight buildings totaling two million square feet was approximately \$4,700. “It’s all about the consumption. If we reduce consumption, we can produce a favorable impact on cost. And if we set baselines, we can get email notifications when things get misaligned from the parameters that we’ve set,” stated Dykes.

VISTA REHAB ENERGY MEASURES IMPLEMENTED

Vista Rehab had building automation from day one, even though it was almost 15 years old. The vast majority of automation programming was either broken or out of calibration—it was noticeably evident that the building was not performing efficiently. As an example, 85 percent of the variable air volume (VAV) boxes never went out of reheat during the Florida summer months which created a condition of simultaneous heating and cooling and dramatically reduced energy efficiency.

A focused retrocommissioning effort was undertaken that included the following measures:

- Outside air sensors were cleaned and calibrated.
- Preheat coil sequencing was corrected to minimize simultaneous heating and cooling.
- Failing controllers were replaced.
- Flow rings in boxes were cleaned and calibrated to provide better airflow readings at the zone level.
- Static settings on air handling units were optimized to provide only as much duct static as necessary to serve the critical zone.

- VAV flows were reset to minimize simultaneous heating and cooling. Every box over 1,000 cubic feet per minute (CFM) of airflow was at least 10 percent out of calibration, typically with a plugged flow sensor. Reports are run quarterly to ensure they remain calibrated.
- Night temperature and humidity setbacks were performed on two large areas during unoccupied periods. Humidity sensors had to be installed to ensure that the setback strategy did not allow humidity to climb above 60 percent or the temperature above 80 degrees.
- Three-way valves were converted to two-way valves, which allowed the pumps for the chilled and hot water systems to be controlled based on actual building demand (static pressure) and ramp down when possible.

SOUTH TOWER CANCER HOSPITAL ENERGY MEASURES IMPLEMENTED

Dykes and his team developed a building-wide strategy for airflow optimization. Toward this end, UF Health hired consultants to help program a more efficient sequence of operations. These consultants more than paid for themselves and are still active today. The automation tools were in place but the configuration needed to be optimized to avoid simultaneous heating and cooling. A significant portion of the building was reconfigured from constant volume airflow to variable volume airflow, per code allowances.

The automation system was installed with a single head-end to allow options for future vendor integrations. Using Microsoft® Reporting and SQL server allows considerable trending, 150,000 points every 15 minutes. Email notifications are sent to alert key individuals of issues violating a certain parameter. This was the single most helpful tool. The cost was \$30,000 in programming expenses.

This automation does not alleviate the need for staff. The data extracted from the analytics allows the facilities team to be predictive and proactive. However, people are needed to both recalibrate and manage trends “out of range.” Not only can the staff fix something that may break, they can actually prevent breakage with this data, in a continuous commissioning effort.



“The more you optimize a building, the more ‘delicate’ it becomes ... operating on ‘the edge.’ We know we’re not compromising patient care; rather, we’re saving money for better patient care. Patient care is everything,” Dykes said.

Results

The future of healthcare cost management is to bend the curve downward. In facilities this involves labor, parts, and energy. Unless we stop maintaining the buildings, energy has the most immediate and achievable gains. While most buildings already had a level of automation, recognizing the ability to operate an optimized building instead of just tracking operations was a breakthrough for us,” said Brad Pollitt, vice president of facilities, UF Health Shands. The specific results were as follows:

- Vista saved \$83,000 despite a 14 percent utility increase.
- South Tower Cancer Hospital has saved \$4.5 million (cumulatively) since the spring of 2011.
- Programming changes resulted in significant utility savings. That money was reallocated toward new energy savings measures.
- There was a 50 to 60 percent decrease in work orders as a result of the building management system (BMS), resulting in an extra half full-time equivalent that can be reallocated toward energy work.
- Five million dollars of documented savings was achieved across the entire health system.

IMPACT FROM ENERGY TO CARE AWARD

“Seeing an impact, without a lot of money spent, is huge motivation for us. We continue to see opportunities for improvement via automation optimization and continuous commissioning,” Dykes said.

Winning the Energy to Care Award helped provide more visibility around the great energy efficiency successes and helped senior leadership understand the effect those efforts had on the facility as well as its stakeholders.

Dykes was doing “energy work” 20 to 30 percent of the time. Because of the successes reported, he is moving toward a more full-time position in energy management. His job description recently changed to Energy Projects Manager.

UF Health has hired two new FTE positions approved for correction and tweaking, so Dykes can allocate more time to energy.

The energy systems department has a greater role in the pre-design phase of new construction, so they can be efficient from the start.

WHAT’S NEXT FOR UF HEALTH?

The goal for UF Health is to “maintain the gains,” as Dykes would say. His team will continue to review trends on major systems (air handlers, chilled water plant, hot water plant, etc.) and monthly bills. Additionally, automation optimization will continue to spread to other facilities; currently about 15 are covered.

Communication and awareness will remain key continuous improvement initiatives. Dykes will continue to prioritize regular communication between energy staff and facility maintenance staff as systems are adjusted. Both groups play a key role to maintain optimization. As success is achieved, organization-wide communication will continue to be important to foster future success.

“Energy savings has made a tremendous budgetary impact, and we see more on the horizon. Bending the cost curve downward helps our corporate mission and provides a sustainable future to our children as well,” according to Pollitt.

**The Energy to Care program, sponsored by Johnson Controls, encourages hospitals across the country to reduce their energy consumption by 10 percent or more over their baseline energy consumption. Since 2009, hospitals participating in the Energy to Care program have tracked more than \$67 million in energy savings. The free program includes a robust energy-benchmarking tool in addition to the awards. ASHE congratulates these hospitals for their leadership in reducing energy consumption.*



American Society for Healthcare Engineering

A personal membership group of the
American Hospital Association

**The American Society for Healthcare Engineering (ASHE)
of the American Hospital Association**

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The logo for Energy to Care features the words "energy" and "to care" in a blue, sans-serif font. A blue plus sign is positioned above the "y" in "energy". To the right of "to care" is the tagline "Greater efficiency supports patient care." in an orange, italicized, sans-serif font.

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