

University Gets an “A” for BTU Measurement

The University of South Florida was founded in 1956 and is a public university serving over 35,000 full-time students. The main campus, located in Tampa, Florida, is one of the twenty largest universities in the United States. Like many large campuses, a central energy plant with chilled water and hot water distribution throughout the campus provides heating and cooling to over eighty buildings. Undertaking a campus-wide metering project for over 4.3 million square feet of conditioned space was no easy task.

USF did not have a comprehensive method of measuring actual energy usage in individual buildings. While some buildings had meters of various types in place, most did not. Internal utility bills were based on square footage of conditioned space and this fixed-cost method offered no incentive for energy conservation by individual departments. In addition, the Physical Plant Department was tasked with managing vast resources with insufficient information regarding their use.

Focus on Accuracy

As one of the largest energy users on campus, Residence Hall Management pressed for a more accurate method of billing for their chilled water and hot water usage; one that would allow them more control over their budget and monthly utility bills. As a result, a committee was formed to search for a metering solution that would provide accurate cost allocation



data and help create a more energy conscious campus.

The committee was led by Nainan Desai, Professional Engineer at USF, and included members from Energy Management, Technical Services, Maintenance, Utilities, Facilities Planning and Residence Halls. The engineering consultant for the project was Anston - Greenlees, Inc., of Tampa, FL. Systems from several manufacturers and distributors were evaluated with the focus on accuracy, reliability, cost and installation requirements. The challenge was to find a system that would meet everyone’s expectations with respect to accuracy while staying within the budget. In addition, the installation had to be performed without interrupting the flow of heating and cooling water to the buildings.

The committee selected a BTU Measurement System from ONICON Incorporated of Clearwater, Florida to become the standard BTU meter for the campus. Each system consists of an insertion turbine flow meter,

a pair of matched temperature sensors, a BTU Meter that calculates energy based on inputs from the flow meter and temperature sensors, and all required components to allow installation without a system shutdown. Factory calibration with NIST traceability, along with factory commissioning after installation, provided the foundation for a successful metering program. “Existing buildings already have some of Onicon’s meters installed on campus so we knew it was a good product and they are cost competitive,” said Desai.

Existing Buildings Pose Challenges

The first phase of the metering program targeted the Residence Halls. USF has over 900,000 square feet dedicated to student housing, with approximately 2600 students living on campus. A total of fifty-six BTU Measurement Systems were installed in twenty-one buildings. While most buildings required two systems, one for HW and one for CHW, several of the larger dorms were built with multiple feeds from the central chilled and hot water mains. These buildings required more than one set of meters.

USF decided to manage the project in-house because of their team’s insight into the individual building systems and internal customers’ needs. USF and ONICON worked very closely to ensure a successful installation of the equipment and implementation of the project. Bowen Ierna, Project Manager with Onicon said, “ We felt that it was very important to be closely involved with USF through all phases of the project, including the initial planning.” Most of



the buildings are over twenty years old, and were constructed without provision for sub-metering. Small, cramped mechanical rooms typically pose a challenge to flow measurement due to the lack of available straight pipe run required to maintain accuracy. During the planning stage, a field engineer from the factory surveyed each proposed meter site and marked the pipes for insulation removal and tapping locations. For locations with poor flow conditions due to limited straight pipe runs, ONICON's patented Dual Turbine™ flow meters were specified to maintain high accuracy.

Good Planning Pays Off

Being closely involved from the start enabled USF and Onicon to uncover the tough installation locations early on. They were able to design and implement solutions without affecting the project schedule. The close working relationship between USF's project team and Onicon's personnel allowed the project to be completed on time and within budget.

With few exceptions, installations were performed with no interruption of heating and cooling water flow to the buildings. This was accomplished with ONICON's standard hot tap insertion flow meters, and special hot tap thermowells for temperature sensors. "Another important benefit of using hot tap meters is that it facilitates easy removal of system components for service and recalibration," said Ierna. "While ONICON meters provide many years of accurate trouble-free performance, serviceability without system shutdown is

critical for a successful long term metering solution."

Project benefits everyone

The installation of the BTU metering system provides critical information needed for the planning of future campus development while providing accurate billing for the University. The new systems also promote energy conservation by identifying problem areas and large energy users. "This is a win-win situation for everyone. Auxiliary departments have control over their budget and energy costs. The Physical Plant can recover the cost that is incurred by the plant and less energy is used or wasted which is better for the environment," stated Nainan Desai.

After the successful completion of the residence hall metering systems, the University of South Florida is continuing to install BTU measurement systems throughout the rest of the campus. Adrian Curta, Director of USF's Physical Plant stated, "In the past we struggled with accounting for BTU usage and charging internal customers. The new BTU measurement system solves that problem for us and there will be energy conservation across the campus."