June 13, 2013

Proposal Title:

Juniper-Poplar Hall HVAC Energy Conservation Project

Organization: Housing and Residential Education

Description:

Heating and cooling is the largest component of total energy consumption in nearly all buildings. This is no exception in student housing where waste is considerably more prevalent. As students are away from their rooms more than half the time, they frequently if not always, leave utilities running in their absence. The USF Housing and Residential Department and its partner Johnson Controls incorporate a common sense solution, which automatically places the HVAC systems in a more energy efficient level when rooms are empty or occupied. At Juniper Hall, we installed controls to limit set points for heating and cooling that effect the run times of the Fan coil Units in rooms and common space areas . We have completed an installation where these controls were installed and the maintenance department will be able to monitor all components related to building automation via a web based platform. Use of the internet will provide constant feedback in real time to optimize the buildings performance to preset levels. This Johnson Controls system utilizes multiple sensors which are hardwired or wirelessly assembled to a small energy management unit that controls 2 fan coil units and multiple HVAC components minimizing the numbers of equipment needed. This unit is also expandable to other energy management solutions that are programmed for future installation.

Operation-When a dorm room is occupied- HVAC functions are maintained according to the parameters set for occupied mode that is most efficient from the HVAC design. Individual units can be adjusted for special situations. As outside air temperatures change and interior conditions permit and the system is satisfied the energy management unit is activated and begins to gently set back to a more energy efficient temperature. This results in energy savings. During periods of known vacancies the system is programmed to switch to unoccupied mode and even more set back is engaged furthering the savings but constantly modulating to managing humidity and building stability. This system has additional features that will also help to better accommodate our students personal comfort as we expand its future capabilities along with our current card access system upgrade projects. When an occupant arrives at any main entrance to the facility and swipes in the system acknowledges them ensuring a quick recovery to the last known set point, and a comfortable room upon arrival. Same principle when preprogrammed to occupied mode with a desired arrival date and time of a student.

Data- The data from the sensor equipment installed constantly monitors and records the times the room was unoccupied or occupied, the on and off times of the FCU's and the temperature ranges. This Is also occurring for all the buildings systems that are involved to manage the entire system as a whole (Rooftop dehumidifiers mechanical room cooling coils corridor fan coil systems) All of this information will be used along with general building efficiency calculations and ASHRAE heating and cooling degree days to estimate the annual savings that we should realize.

The system is installed in the complete Juniper building rooms and common spaces. We can easily compare the differences in the Juniper and Poplar meter readings and utility bills from before and after. The annual savings are expected to be a minimum of 7% We have the capability to show in real time on dashboards and other media sources by floor by pod or by entire building the energy usage of the location creating student involvement in managing their surroundings and being good stewards of the environment students can easily see the outcome of the project.

Energy savings contribution can be distributed between Residential Education and The Student Green Energy Fund to continue the sustainability of the program and help it to further other facilities and programs throughout campus. Being forward thinking Residential education have installed a system that can be intergraded with other facilities on or off campus to monitor their success and create student involvement from class room to class room or interest group to interest group the possibilities are endless this program will continue to excel because of it whole campus approach which is what are Mission statement advises

Amount Requested: $104,760.00

Budget Justification: This amount was previously allocated to this project and we are requesting it be followed through to help offset cost on this first project since the scope is significantly larger and far better suited for future growth

We know the total system cost installed $196,204.00

Receive the TECO rebate of $19,229.65 the installed cost would be reduced to $174,974.35

Resource Matching: We are looking to match any funds you are able to contribute to all Housing and Residential Education sustainability and energy management programs and willing to offset your involvement with the appropriate return of payback to your contribution annual. This will continue to help this program move forward for all students now and in the future

As noted above, we are seeking a TECO rebate of $19,229.65. H&RE has already paid for

Installation of controls and monitoring in the amount of $196,204.00

H&RE will provide oversight and management.

Timeline & Milestones:

Job complete we are moving forward with other energy management in Castor Beta and Kosove Halls

Evaluation Metrics:

We have already completed the installation and will start the monitoring process July 1, 2013 We would like to extend the monitoring through June 2014 to evaluate the outcomes of a full heating and cooling cycle monitoring electrical invoices as well as the chilled water metering should easily confirm what the monthly savings would be and could be compared to past years invoices.

Plan for Sustainability:

The continuation of this project will be easily maintained by H&RE by utilizing the web based management dashboard along with alarm monitoring by our partners Johnson Controls. Replacement/repair and upkeep of the HVAC equipment and its sensors will be through a preventive maintenance approach that this system creates utilizing trending attitudes (repair/replace before it breaks). This next leads to monitoring and managing water and gas consumption by expansion of this system.

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Director of Facilities

Housing & Residential Education