Mehaffey envisioned a system that merged IT and building-system functions, enabling the university to run and manage everything centrally over an IP network that communicates with an open database through a common web browser.

Challenge
Mehaffey’s goal was to incorporate IT operations and facility operations into one group, and to converge 23 systems combining the university’s IT infrastructure, fire, security, HVAC, power quality/usage monitoring and building control systems on a single Internet protocol (IP) common platform.

Solution
In considering Eaton’s existing energy management offering, Mehaffey did not believe that its older, proprietary communication platform was consistent with his goal to create a technologically advanced campus that inter-operated and communicated between all facilities and systems, plus provided information and data that could be used to make management decisions and cost projections.

Results
Since Eaton was able to install the hardware upfront, it began metering as soon as electricity started to flow and capturing information. Even before the software, storage information and reports were operational; the meters were already collecting data, even during construction.

Not long after the system began operating, the university received an electric bill that it felt was astronomical. After calling the electric company...
and explaining that an error was suspected, the electric company denied it citing that a physical reading had been taken and therefore must be accurate.

Ave Maria’s Operations Manager Wally Hedman reports, “We were able to pull a report for our usage through that billing period and present it to the power company to prove our actual electrical consumption during that time frame. It conflicted with the historical information that the power company had. As a result, we received a $35,000 reimbursement for over charges.”

In the three years that the Power Xpert Foreseer Class has been in place, it has enabled the university to monitor its electrical usage, identify trends and take proactive steps to reduce consumption.

Hedman explains, “After we received a substantial number of complaints from students that the dormitory rooms were too cold, we raised our HVAC set point from 76 degrees to 78 degrees. In a matter of two hours we were able to see a change in the energy consumption of the building. That set point adjustment saved us about $200,000 annually. Anything that you can do to reduce consumption is fiscally important.

“To effectively manage energy, it is necessary to have historical data. That’s one of the key features of Power Xpert that we find exceptionally valuable. Recently, I was reviewing our library’s electrical consumption over a 24-hour period for this June 2010 versus June 2009.

We had set points at 10 p.m. for the lights to go off, at midnight the HVAC would drop down a few degrees and at 4 a.m. the HVAC system actually went to an ‘unoccupied space’ setting. We had this step down approach to our lowest level of electrical consumption in a 24-hour cycle. We have now changed our adjustments so our consumption graph is more of a U-shape curve. Energy consumption drops off at 10 p.m. gets down to its lowest level and remains there until it gradually comes back up again around 7 a.m. This has enabled us to achieve additional energy cost savings.

“The Power Xpert system also gives us the ability to look at the power consumption of individual buildings. When we saw that one of three identical dormitory buildings tended to use 30 percent more electricity and propane than the other two, we knew we needed to go in and take a much closer look at that building and find the reason. After investigating, we found that the primary cause was that some of the valves were wired backward. As a result, when the system sent an instruction, whether it was to cool the facility or open a valve, just the opposite happened.

“Although we track consumption of all the utilities daily, for each quarter we compile a utility report to discuss the system’s energy usage in an overall way. During our discussions we found that it’s the temperature that is very energy efficient, but not always in the amount that we expect. Or in the case of motors in the academic laboratories, were starting up and causing spikes. Reviewing one graph of a holiday period, I noticed that two motors in the academic laboratories were spiking at 11 a.m. each day and showed a flat line during the rest of the day. Under normal conditions, I would not have seen them because they are covered up by the standard building consumption shown by the graph.

“We investigated and found that the spikes were caused by the eight fume hoods’ exhaust systems, which are cabinets where chemistry and biology experiments are kept. The fume hoods, which extract any noxious fumes that might be present, were set to operate at 11 a.m. each day. Rather than have the exhaust systems operate daily, we determined that installing a system that only operates when it detects the presence of fumes would be more energy efficient. We installed a system that does a much finer sampling of air and activates the exhaust system and flushes the air, as it is needed.

“The level of detail of the energy consumption we saw in the graph enabled us to investigate why it was happening and proactively address it. As a result, we are saving about $30,000 a year on electricity.”

Mehaffey adds, “I don’t know how anyone can effectively manage an infrastructure of any size without an energy management system that provides the information we get out of the Power Xpert Foreseer Class system. We would be lost without it.”

While the Power Xpert Software Foreseer Class monitoring system had the ability to get data, reports had to be created to organize it into useful information for decision making. Working together, Eaton and Ave Maria organized the information into a system that was flexible enough to generate customized reports and created the end user interface.

Mehaffey says, “That capability is what we count on. It’s not just a ‘nice thing to have,’ it’s vital and we rely on it. As a result, we have been very successful in not only creating an environment that is very energy efficient, but also enables us to accurately project our energy consumption and bills. The Power Xpert system is crucial to our financial performance. It is the tool at the heart of our being able to create projections and manage our energy.”

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Printed in USA
CS02681002E / TN
October 2010

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