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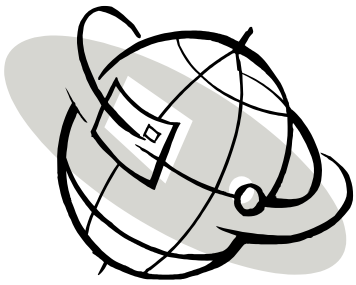
PEM Goes International

Since announcing the availability of the *PEM* certification through Schneider Electric's on-line ***Energy University*** in late October 2012, more than thirty (30) new *Professional Energy Managers* have completed the on-line program and been certified. The new PEMs are located in eleven (11) countries, including the USA, Canada, Brazil, the United Kingdom, the Netherlands, France, Spain, United Arab Emiratis, the Russian Federation, Australia, and China.

PEMs in Eleven (11) Countries

The response to the initial on-line program offering has been very encouraging. There are plans to translate the material and examinations into several languages to further increase the audience. This collaboration will go a long way to providing additional qualified professionals to address the complex energy issues facing us today.



Tips from the Board

Focus on Commercial HVAC Systems

HVAC Systems offer a unique challenge to an Energy Manager. Consider the following:

- HVAC systems are typically the largest consumer of energy in a commercial facility,
- Every occupant may have a different definition of "comfort",
- The system may have been designed for a different space configuration or application, and
- Due to the capital cost, replacement is generally only considered as a last resort.

So, what steps can be taken with existing systems to optimize performance and minimize HVAC energy related expenditures?

1. <u>*Controls*</u> – Make sure that system controls are functioning and calibrated and set points are being maintained.
2. <u>*Ventilation*</u> – Assure that the appropriate amount of outdoor air is being supplied during both occupied and unoccupied times.
3. <u>*Preventive Maintenance (PM)*</u> – A comprehensive PM program will maintain system efficiency, thereby minimizing operating costs. In addition, scheduled maintenance can identify potential problems, thereby avoiding costly breakdowns and extend equipment life.

Contributor: Thomas D. Mull PE, PEM

Finding Waste with Data Loggers

"This abridged article previously appeared in the Boone REMC Power Talk newsletter, and is reprinted with permission."

Key Points:

- Data loggers are portable measuring instruments that can track energy use throughout your facility.
- Record voltage and current, as well as temperature, light level, flow and other important measures.
- Devices range from simple stand-alone units, to complex systems that record and analyze data from a variety of inputs.

The old saying that *you cannot manage what you cannot measure* is as true for energy use as anything else. Energy use occurs over time, so to fully understand it you need to measure it over time. Utility bills provide information on building energy use and demand. On an overall level, this can help you track changes on a monthly basis, but it does not help you understand where, when and why the changes are happening.

Portable data logging instruments are inexpensive, easy to use and durable enough to operate in harsh working environments. With careful placement, they can help you pinpoint where and when energy waste is occurring, giving you the information you need to spot energy-saving opportunities and better manage energy use.

How data loggers work

Data loggers are lightweight, portable, electronic monitoring devices used for data acquisition. They can record voltage and current, as well as temperature, flow, pressure, light levels and more. These tiny devices can be installed and removed without disrupting staff or operations and they can be set up to record data at almost any time interval.

The main components of a data logger include a sensor input, microprocessor, digital converter, memory and a real-time clock. Sensors connected to the data logger provide the information to be measured. Energy sensors measure voltage and current, from which kilowatt-hour (kWh) use, power factor and other energy indicators can be determined.

Temperature, pressure and light sensors help to measure equipment performance and uncover energy losses. For example, installing a pressure transducer on a compressed air receiver allows you to compare receiver pressure to compressor power (in kilowatts) over time. Recording compressor power will also tell you how often it is operating at part load and if equipment is being left on when it should be shut down.

Once the data is collected, it has to be extracted so that it can be used. The simplest method is a data logger unit display that indicates some real-time or cumulative value, such as the total kilowatt-hour usage for a specific device that is being monitored. Data loggers are often sold as part of a data acquisition system that includes software for download. Most software programs perform data analysis of multiple variables and graphically display data on easy to read tables and charts. You can also purchase some third-party software for data analysis.

"Portable data logging instruments are inexpensive, easy to use and durable enough to operate in harsh working environments.

Case Study – City of Jacksonville, NC Leased Lighting

By: Norman G. Miller, Jr., PEM

"The result of that audit indicated that the eleven percent (11%) outage figure was consistent throughout the City for both utilities."

*"….the city was being billed over **$4,500 every month** for street and area lighting fixtures that were not operating."*

In late 2010 I was hired as the Energy Conservation Officer for the City of Jacksonville, North Carolina. The position was one of several funded through a federal ARRA Energy Efficiency and Conservation Block Grant. The job of the Energy Conservation Officer was to aid the City Facility Manager in the administration of energy activities as defined in the grant. These activities included lighting upgrades, deployment of an energy management system, and promoting energy conservation among the City staff and employees. In addition to the defined roles of the position, I was tasked with the research and development of other strategies to increase energy efficiency and conservation while decreasing energy costs and waste.

One such focus was the street and area lighting being provided by the two electric utilities serving the city; Progress Energy and Jones-Onslow EMC. During one of my night energy audits, I found that five of the six lights serving the street approaching the facility were not operating. As it turned out, all five had been vandalized. On the way back to my office that night I counted the total number of existing lights along the route and kept track of the number of lights that had failed. To my surprise, eleven percent (11%) of the lights were out of service.

This information was reported to the Facility Manager and City Manager. I was then tasked with performing a city-wide audit of utility leased street and area lighting. The result of that audit indicated that the eleven percent (11%) outage figure was consistent throughout the City for both utilities.

Using an average of $15 per failed fixture per month, the city was being billed over $4,500 every month for street and area lighting fixtures that were not operating. By examination of the utility lighting schedules, and through discussions with utility representatives, I became aware that it is the responsibility of the customer to notify the utility of lighting failures. For a customer with a single area light or parking lot, reporting such a problem is a relatively easy task. However, the City of Jacksonville has over 3,000 contract lights in place at dozens of City facilities and along 180 miles of roadway.

Residents and City employees can and do report street lighting outages directly to the utilities, or to the City, by following the procedure on their respective websites. While the initial audit discovered over 300 outages, the result of the subsequent audits indicated a failure rate of approximately 90 fixtures per quarter, or about one per day. Continued quarterly audits help restore all lighting on a regular basis and prevent a backlog of unreported outages.

In addition to lighting inspections and outage reports, I obtained spreadsheets from both utilities which showed the number of lights, location, style, type, and rate charged for each of the lights. Comparison of the information on the spreadsheets with the results of my inspections showed:

- Continuous billing for lights no longer in existence
- Other utility customer's lighting billed to City of Jacksonville accounts
- Billing at higher rates than advertised for existing fixtures in service
- Double billing for the same fixtures

When billing errors were reported and verified by the respective utility, credits were issued for up to 36 months of back billing.

The lighting audit process involved:

- Notifying management and the police department of the schedule
- Acquiring necessary inspection and safety equipment
- Documenting and reporting the results of the inspections
- Performing follow up, spot checks of reported repairs

The actual man-hours per audit spent in the field were approximately 45 hours. Another three to four hours were spent on the reporting process. During my time with the city, I performed these audits alone, but recommend a two-man operation; one person driving and one person documenting.

Quarterly inspections and investigations resulted in the identification of numerous lighting fixtures that were not operating and the reimbursement of wasted energy dollars. Fixtures were usually repaired promptly, providing the intended safety and security lighting, while reducing liability to the city.

Norman Miller is a graduate of the NCSU Energy Management Diploma Program and received his Professional Energy Manager certification in November 2011.

PEM
Professional Energy Manager

IEP
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IPE Website Update

IEP is currently updating its website (*http://www.theiep.org*). The modifications should be completed around March 4th. The updated website will include a listing of all of the past Newsletters, as well as other modifications to make accessing information easier.

Be a Contributor

The goal of the IEP Newsletter is to provide PEMs with timely useful information to help them better manage energy resources and control utility expenditures. To that end we would like your input. Let us know what type of information, articles or updates you would like to see in future Newsletters. Contact Dan Mull with your suggestions.

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