

SPARK

Insights on Energy Management for Retail – May 2015

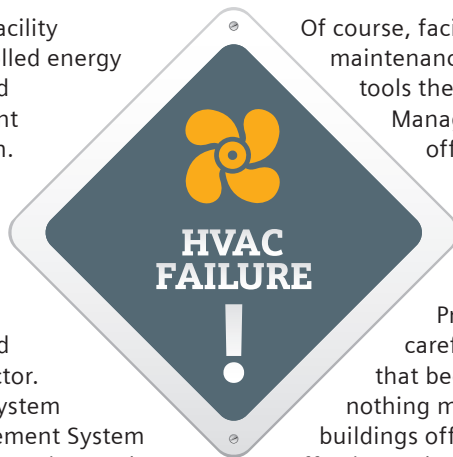
It's Spring and that means Major League Baseball is back in full swing. During the off-season, proactive general managers were busy preparing for October play by building their minor league system with a deep, youthful bench of talent. Reactive general managers were searching for free-agent talent to plug the holes in their line-up. When you consider the differing strategies of these general managers, and look at the teams who consistently make it to postseason play, proactive teams typically have more rings to wear. This analogy can be applied to the way retailers manage their HVAC building maintenance across an enterprise: proactively or reactively.



Why Failure Should Not be an Option: Proactive vs. Reactive HVAC Equipment Maintenance

Proactive management is when energy and facility managers use the analytics a centrally controlled energy management platform provides to rapidly and effectively identify and resolve true equipment problems or site issues across the entire chain. This type of management drives energy savings while also providing a quick payback on the investment.

Reactive management is when energy and facility managers respond to complaint calls. Money is spent to address comfort issues, and energy savings is not necessarily a driving factor. Today, despite having Energy Management System (EMS) or Computerized Maintenance Management System tools, many retail organizations operate in a reactive mode.



Of course, facility executives would prefer to schedule maintenance activities using the predictive maintenance tools their EMS or Computerized Maintenance Management System generates, but the "front office" continues to squeeze facility maintenance budget dollars as an overhead expense, which continues to foster an environment of reactive spending.

Why is failure an option anywhere?

Proper maintenance of HVAC systems requires careful planning and forward thinking – activities that become lost when maintenance is considered nothing more than an overhead expense. Yet retail buildings offer significant opportunities for deep, cost-effective and energy efficiency improvements, with over

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Why Failure Should Not be an Option... continued

70% of today's existing retail buildings being built before 1980. Many are past due for upgrades to aging building equipment, systems, and assemblies. According to the U.S. Department of Energy, a typical retail building can cut energy use by up to 15% by implementing no and low cost measures and over 45% by pursuing deeper retrofit measures. In our own experience with retailers, Siemens routinely sees use reductions of 15–30% by implementation of an enterprise EMS.

The most common reasons cited for reactive maintenance is the lack of sufficient budget dollars and facility resources. In the reactive mode, an energy or facility manager is tasked with resolving the immediate problem as quickly as possible at the lowest possible cost. All retailers are feeling profit margin pressure and keeping overhead costs low helps increase profits.

The pitfalls & risks of reactive maintenance

Why is reactive maintenance a swing and a miss? Organizations that have implemented comprehensive planned and predictive maintenance programs show dramatic decreases in overall maintenance costs. And when other factors are included, such as extended equipment life, reduced energy use, less frequent system downtime, and decreased interruptions to store operations, organizations that have implemented comprehensive maintenance programs find that their total costs can be as much as 35-45% lower than the costs for those organizations that continue to maintain equipment reactively.

Yes, improving energy performance does require effort, high-level commitment, and some potential risks; however, the notion that repairing on an "as needed" basis is more cost-effective is simply not true. Reactive maintenance is the most costly way to maintain your buildings HVAC systems. In fact, after considering the risks associated with reactive management, you might conclude they are far more costly than the fast, return-on-investment opportunity that proactive maintenance enables:

Business disruption

Buildings today depend on properly operating systems for more than just people comfort. For example, most telecommunications systems have requirements for specific environmental conditions to operate properly. In many cases, a retailer's IT infrastructure is shoved into the branch manager's office, which isn't commissioned to handle the sensitive heating and cooling needs of telecommunication equipment. Temperatures and humidity levels that fall outside of range can lead to interruption in services and even costly system failures.

Bad customer experience

Sometimes the difference between keeping a business running and having to shut down is nothing more than a proper HVAC system maintenance program. All it takes is one bad customer experience – a store that's closed for an HVAC repair; a shop that's uncomfortably hot and stuffy; or, a restaurant that's frigid – for your customers to turn to a competitor for a more comfortable experience.

Peak rates and no competitive bids

Equipment is fickle and breakdowns always seem to occur when you least need them: in the middle of a summer heat wave or during a busy holiday weekend rush. Calling in a service dispatch during these times is not only more expensive, but also eliminates your opportunity to explore competitive bids and volume discounts because the equipment needs to be fixed at any cost and as quickly as possible.

Hasty or oversized equipment decisions

Rather than making a carefully planned purchase that fits into an overall building optimization plan, emergency situations require quick solutions, oftentimes based on the inventory that's available at the time. For example, if a store's 10-ton rooftop unit needs replacement, the immediate reaction would be to replace with a new 10-ton unit. A holistic replacement plan, supported by enterprise analytics, however, would have identified if the heating and cooling system could be resized to meet the demands of an optimized building. A more efficient 7-1/2-ton rooftop unit might be a better match. The smaller rooftop unit would cost less and perform better, generating annual savings on energy and operating costs.



"A majority of companies consider reactive maintenance the norm, not the exception."

– Siemens

Energy cost of failing units

In a typical retail space, several HVAC units serve a common sales area, with the air diffusers 16 – 24' above the sales floor. In this situation, underperforming or failing equipment can run undetected for months, or even years, costing hundreds of dollars per month in wasted energy and wear-and-tear. Failing units make matters worse by bringing unconditioned air into the space that their neighboring units must overcome, further increasing the wasted energy usage and maintenance liability.



Why Failure Should Not be an Option... continued

Rising energy prices

Even when running to nameplate standards, old equipment uses more energy than newer units incorporating advanced technology. A standard efficiency 15-year-old 10-ton rooftop unit has an Energy Efficiency Ratio of 9.0. Compare that to a new high-efficiency 10-ton unit that operates at a minimum 12.1 EER, with some units running at 24 EER or higher.* Plus, new units save additional energy by incorporating seasonal energy use, advanced controls such as VFDs and the latest ASHRAE standards. As you calculate the cost of energy prices across your enterprise, this will add up. Also keep in mind that the cost of energy is expected to continue to increase in the years ahead.

*Full load comparisons.

Regulatory mandates

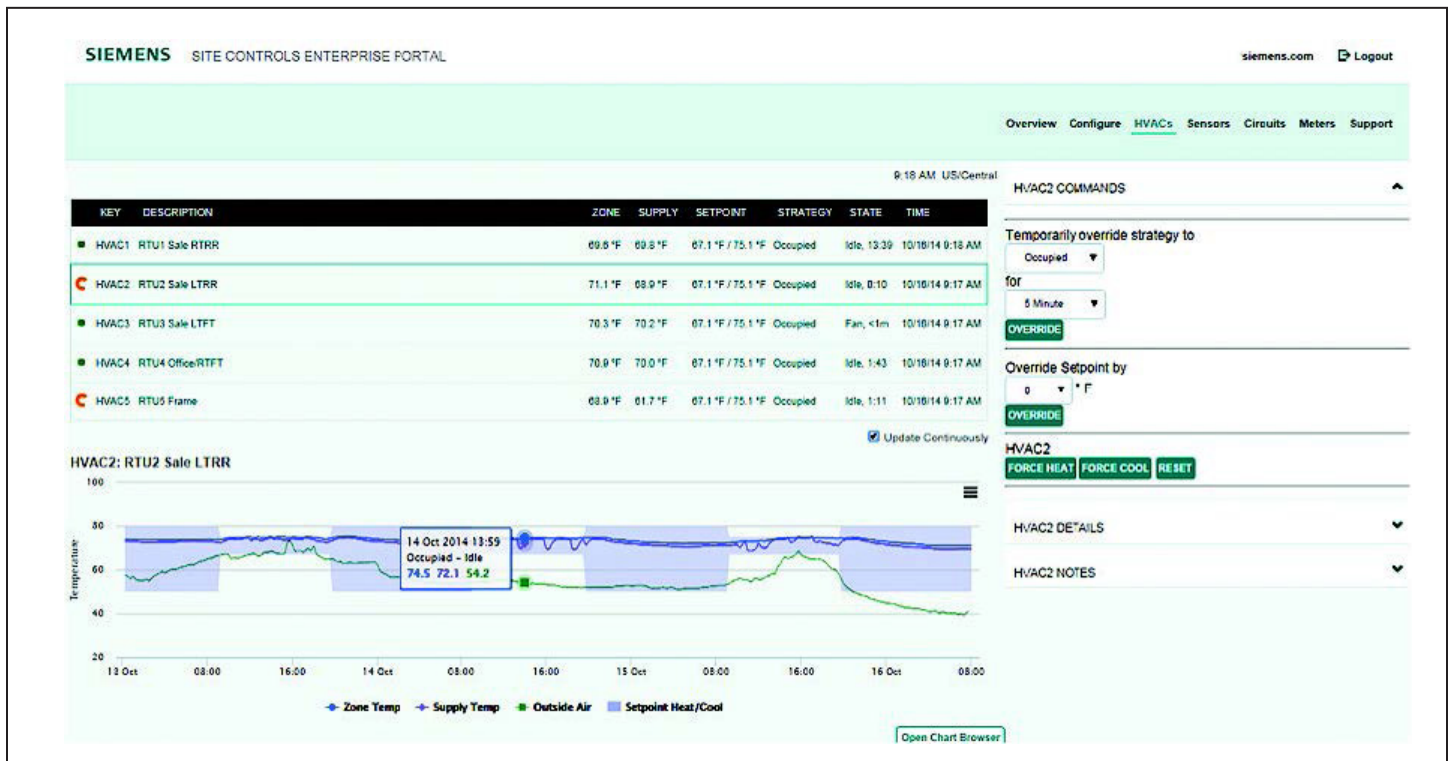
The Federal and some state governments have put the high-energy use of buildings front and center in their efforts to reduce energy use and carbon emissions (Landsberg, Lord and Carlson, 2009). If policymakers choose to regulate energy and carbon as a way to reduce energy consumption, energy producers will likely pass on the additional costs to energy

consumers. An energy efficient building would be less impacted by this cost increase than inefficient buildings. Furthermore, legislation to promote the use of energy efficiency technologies in commercial properties proposes offering Commercial Building Energy Efficiency Financing incentives for building efficiency upgrades and renovations.

So is running to fail more cost-effective than replacement?

Saying that money is needed to overhaul or replace an RTU, particularly while aging roof top units are still running, will not be enough to rally the backing of your organization. Facility executives need to demonstrate the consequences of ignoring HVAC system maintenance while identifying the real cost savings associated with comprehensive maintenance program. Demonstrating the dollars invested on the maintenance of these systems will result in an improvement to the bottom line.

Facility managers who have an EMS in place should use the collected data to identify energy-related anomalies and generate prioritized maintenance reports. Then they should pinpoint the worst underperformers – equipment or systems that have not been properly maintained due to lack of resources. If maintenance has not been a high priority, chances are, there



The Siemens Site Controls® Enterprise Portal helps users find answers as efficiently as possible, including enhanced graphing of each device (HVAC, Sensors, Circuits, Meters).



Why Failure Should Not be an Option... continued

have been a number of unexpected equipment failures that have occurred during the past and will occur again in the upcoming budget year. Use the EMS HVAC Health reports to compare and review the maintenance records for the equipment or system. These records will exist in the form of work orders, service calls, overtime costs, and store/customer complaints. Show what the lack of maintenance is costing your department and operation in terms of reactive maintenance costs and interruptions of service. Compare this to what it would have cost to perform the required maintenance.

Don't stop there, quantify what would happen if that particular piece of equipment would fail and require replacement:

- What would it cost to replace it?
- How long would it take to purchase and install the replacement?
- How its failure would impact your facility department and store operations?

Compare the costs of repairing vs. replacing by adding the costs of repair (and expected future repairs) plus expected future

operating costs (including the higher energy costs of running an underperforming unit), vs. the cost of installing the new unit and expected future operating costs (which should be lower, due to the increased efficiency of the unit and fewer service calls). Also consider the fact that your utility company may offer rebates for installing high-efficiency units, and that warranties on new equipment would also increase savings.

“Making predictions is a very hard thing to do, especially when it’s about the future.”

– Yogi Berra

How to “pitch” a replacement plan and gain your organization’s commitment

In many organizations, internal infrastructure operations are not linked to business strategy discussions. One way to create this link is by gaining a high-level commitment to reducing energy use.

Reactive vs. Proactive Dispatch Scenarios

	Reactive	Proactive
Event trigger	Inbound Call center or energy manager responds to call or email service request from store manager.	Outbound Self-initiated from energy team, ideally as part of a standard recurring process.
Focus	Issue Resolution Resolve the problem (real or perceived) at lowest possible cost and highest transactional efficiency.	Issue Identification Identify and resolve issues that otherwise would go unnoticed for weeks or months.
View of dispatch cost	Cost of Doing Business Avoid or minimize the expense of a dispatch. The ROI on this dispatch is most likely lower than other opportunities within the store portfolio.	Investment Each dispatch will have its own ROI driven by energy and maintenance savings. Dispatches will often extend asset life by averting more expensive repairs. Combine dispatch with other items if possible.
Time sensitivity & importance	Urgent; Possibly Important Internal stakeholder (e.g. store manager) expects rapid response, regardless of the importance in terms of energy use.	Important; Not Necessarily Urgent These opportunities have large ROI, but no stakeholders are demanding a response.
Interaction with Site Controls Enterprise Portal	Site Level Drill down to the specific site as quickly as possible to assess issue and determine if dispatch is required.	Enterprise Level then Site Level Use the advanced analytics to identify the highest ROI opportunities for immediate remote corrective action or for dispatch. Post validation of service work performed.
Budget Impacts when using the Site Controls Enterprise Portal	Reduced R&M Spend: 10-15%. Post validation of service work performed.	Reduced Energy Costs: 2-5% in addition to standard and advanced EMS control. Capital Budget: 15-20% increase in asset life.



Why Failure Should Not be an Option... continued

If facility executives are to receive the budgetary support necessary to carry out their mission plan, they must present their case in the terms that are best understood by budget managers and decision makers. Proper documentation of these benefits will help budget managers and decision makers develop the same level of understanding. This can be accomplished by using the reports your EMS provides to help “sell” a replacement plan to the business strategy/budgeting/finance team.

Hit it out of the park

When you fully utilize your EMS, the cost reduction opportunities on the facility maintenance budget can be substantial. When a comprehensive plan is implemented and integrated with predictive maintenance programs, there is a dramatic decrease in a business’s overall energy and maintenance costs. The linchpin of this plan is to take action on the supplied data that your EMS provides. This allows gains to be maintained and increased over time.

For example, with the Siemens Site Controls™ Energy Management System for Retail Enterprises, the data collected from each site is analyzed extensively. Possible issues (termed ‘exceptions’) are automatically highlighted and prioritized, pointing the way to in-depth diagnosis of problems, many of which can be handled remotely, without requiring a service call.

Analytics are used to:

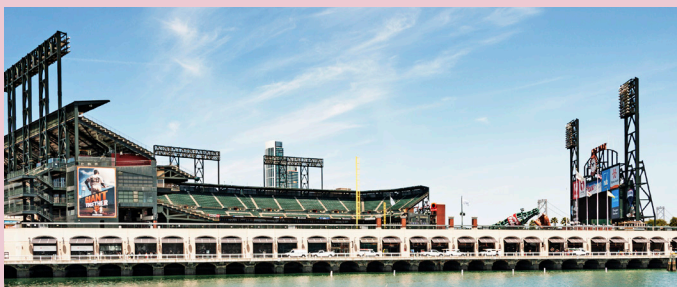
- make the job of the facilities manager less reactive and more proactive
- determine where and when repairs are needed
- highlight stores using excessive energy

This has been proven to generate additional savings on energy costs and improves asset life by up to 25%. And when other benefits are included in the calculation, such as extended equipment life, less frequent system downtime, and decreased interruptions to store operations, Siemens customers have lowered their total costs by more than 30%.

“We enhanced our decision-making as a result of having more accurate information in a central repository of site asset and operating data and this enabled improved facilities maintenance budgeting.”

– Director, Energy & Engineering,
Nationwide Closeout Retailer

Root for the Home Team at one of the Most Energy-Efficient Baseball Stadiums



AT&T Park, home to the San Francisco Giants

The Giants are helping lead the way in sustainable design for professional sports. After completing a stadium-wide retrofit in 2010, AT&T Park obtained LEED Silver certification for existing buildings.

- Incandescent lights replaced with CFLs ballpark-wide.
- Motion-sensor lighting.
- Concourse signage lighting replaced with an infrared-type, high-output lamp controlled by a low-output ballast.
- 18 home batting cage sports lights converted to LEDs.
- Upgrading to a high-definition scoreboard that is 80% more efficient than its predecessor.
- Installing strip curtains in all walk-in refrigerators.

Several of the park’s features that contributed to its LEED certification are also historic achievements. For example, AT&T Park became the first ballpark in the nation to install a solar energy system, which provides up to 122 kilowatts of renewable energy for customers in the Bay Area, and the first ballpark to offer publicly-accessible electric vehicle charging stations.

Source: <http://www.ase.org/resources/americas-top-7-energy-efficient-baseball-stadiums> and <http://www.usgbc.org/articles/making-history-att-park-home-san-francisco-giants>



The Energy Savings and Industrial Competitiveness (ESIC) Act



The Shaheen-Portman bill incentivizes the use of efficiency technologies that are commercially available today, can be widely deployed across the country, and quickly pay for themselves through energy savings.

The bill enjoys strong bipartisan support along with the endorsement of various business coalitions, environmental groups, and labor. The bill will help speed the transition to a more energy efficient economy, increasing the country's economic competitiveness and energy security for the coming decades, while driving economic growth and encouraging private sector job creation.

Celebrate Earth Day Every Day

Here are some simple "Acts of Green" to promote efficiency in the workplace and at home:

- **Conserve Paper** – Consider a "Print Free Day" and ask your customers if you can email a receipt to them rather than printing one.
- **Conserve Water** – The less water you use, the less energy is needed to heat the water.
- **Replace Your Lights** – Replacement of incandescent light bulbs for CFLs or LEDs to increase savings. This simple act can reduce carbon footprints by 450 pounds a year.
- **Recycle** – Make sure all employees have access to recycling bins. The three Rs (reduce, reuse and recycle) are words to live by.
- **Car Pool** – Car pool, use public transportation, or drive a fuel-efficient car. For every mile not driven, carbon footprint can be reduced by one pound.
- **Plant a Tree** – It's an effective (and pretty) way to reduce greenhouse gases.



Plus, did you know?

Talk about expending a lot of energy...

The longest MLB game by innings was played on May 1, 1920 between the Brooklyn Dodgers and Boston Braves. It lasted 26 innings and ended in a 1-1 tie. The good news: they didn't have lights and the game was mercifully called due to darkness.

Source: http://www.answers.com/Q/How_many_innings_was_the_longest_baseball_game_in_Major_League_history

