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Regain Control of the HVAC Repair Budget

Save on energy costs; improve productivity and asset life

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Asset management is the process necessary to keep individual sites performing optimally and in accordance with corporate standards. Some retailers express a concern that the visibility the Site Controls Energy Management System (EMS) platform provides into failed and underperforming assets (particularly HVAC units) may "blow the maintenance budget." They fear that awareness of previously hidden maintenance issues will drive excessive Repair and Maintenance (R&M) costs.

In fact, just the opposite is true. While visibility to equipment performance may in some cases lead to service calls that might not otherwise have occurred, the net effect of EMS is a significant reduction in the frequency of dispatches. Further, pre- and post-service call visibility increases the effectiveness of the remaining repair visits that are truly necessary.

As a consequence, the cost reduction opportunities on the facility maintenance budget provided by EMS can be substantial. One nationwide retailer conducted a year-over-year internal study to validate the maintenance impact of the asset management phase and documented cost reductions of 14% — more than \$1,900 per store savings each year.

Furthermore, chain stores that fully utilize the Site Controls™ EMS to help identify and diagnose outliers can generate additional savings on energy costs and improve asset life by up to 25%.

Overview

A proactive asset management approach helps minimally trained staff instantly see all the issues across the enterprise. The process includes the ability to generate reports to identify exceptions across thousands of HVACs and lighting controls. More importantly, the tools and processes must categorize and prioritize issues so that the right things are fixed in the right order.

This gives the facility maintenance staff the ability to create the most value within their budget constraints. It is an approach that helps improve productivity and delivers even greater savings to the bottom line by:

- Averting unnecessary HVAC and Lighting service calls
- Maximizing kWh savings, identifying set point drifts, and pinpointing equipment failures
- Verifying proper preventative maintenance is being performed by service providers
- Preventing store closures by remotely identifying HVAC & Lighting problems

Equipped with the actionable data from the EMS, the facility maintenance team can manage each service dispatch to drive cost efficiency. The process provides clear and complete directions to the service provider and consolidates dispatches and the tools needed to validate repairs before the service contractor leaves a site. Such information can be used to identify repeat issues requiring repeat service but should be performed under warranty, or to determine if the equipment was installed properly at commissioning. These features drive friction and poor service performance out of the process. By lowering the number of issues and dramatically improving the "first time fix" rate, the average repair costs per site are reduced and customer/employee satisfaction is improved.

EMS-Enabled Activities to Reduce Maintenance Costs

There are several key activities that retailers can implement to leverage the Site Controls data to drive down maintenance costs and improve uptime. Some of these are extremely easy to implement, while others require a higher level of operational maturity. Taken together, by deploying these processes, periodically measuring results, collaborating with maintenance vendors and implementing continuous improvement, retailers can increase the ROI of EMS while ensuring customer comfort and consistent standards throughout their chain.



"We enhanced our decision-making as a result of having more accurate information in a central repository of site asset and operating data, to verify utility billing discrepancies and to enable improved facilities maintenance budgeting."

- Chain Store Director, Energy & Engineering

Processes that reduce R&M costs

The chart below summarizes the operational processes that help retailers drive down maintenance costs and increase efficiency: "Process Sophistication" refers to the relative level of operational discipline and coordination required to consistently implement each activity. Each activity is discussed in detail below.

Underperforming HVAC Identification:

According to the U.S. Department of Energy, many existing Rooftop units (RTUs) are over ten years old with at least five years of useful life. For stores with multiple RTUs, odds are that one or more of them are in some sort of failure mode or performing sub optimally in most stores. Since the other functioning units serving a shared space will overcompensate, store managers and customers will rarely notice the issue(s) at first. Thus failed HVAC units drive excessive energy and maintenance costs with no customer benefits — usually for months, sometimes for years. Repairing the HVACs quickly is well documented to decrease a building's energy usage and increase comfort — but it also directly lowers the annual maintenance costs. Remote detection of performance degradations can be brought to the attention of the maintenance provider prior to the next PM visit and in lieu of an emergency, and possibly after hours, service call. The result is service call avoidance, elimination of overtime/after hours charges, and the potential avoidance of catastrophic repairs through early detection.

For example, a large footprint retailer maintains an onsite data room that controls all POS and hand scanner controls. A temperature exception indicated a failure in the HVAC. An on-site evaluation by a technician indicated a leak in the suction side of the HVAC was causing a cooling failure. Prompt action not only avoided possible store closure and data loss but also helped prevent what could have been much higher HVAC repair costs had the condition been allowed to persist.

Remote HVAC Reset

In addition to being able to quickly identify which HVAC units are in a potential failure mode, the Site Controls

Process	Process Sophistication	Cost Impact
Underperforming HVAC Identification	Low	 Eliminates service calls Combines service with PM call Avoids emergency / after hours charges Avoids catastrophic failures
Remote HVAC Reset	Low	- Avert service calls
Remote HVAC Shutoff	Low	 Reduced equipment wear Energy savings Avert service call (combine with PM visit) Avert catastrophic failure
Remote Equipment Diagnosis	Med	Avert multiple trips to site (missing parts)Ability to obtain competitive bids
Repair & Warranty Validation	Med	 Avoided invoices for warranty work Avoided cost of repeat trips to location
Prioritization of Repairs	High	 Prevent budget overruns without jeopardizing customer comfort
Maintenance Vendor Integration	High	 Reduced PM rates Reduced out of scope work
Predictive Maintenance	High	- Reduced cost of repair



"The Siemens system's ability to remotely reset/restart units frequently avoids the need for a service dispatch altogether."

- Facility Manager Large Specialty Retail Chain

platform enables a temporary shutdown/reset of the unit. For some HVAC units experiencing certain failure modes, calling for a remote system reset may allow the unit to continue functioning until the next PM visit. In these situations, the EMS capabilities not only reduce the cost of energy associated with operating the failing unit, they totally avert the need for an unnecessary dispatch. The cost savings associated with this capability can be substantial.

Remote HVAC Shutoff

If a remote shutdown/reset of the HVAC unit does not fix the problem, the Site Controls system provides the remote capability to temporarily shut down the HVAC so that it does not continue to waste energy and wear out other mechanical parts. By combining remote system diagnosis with remedial action, significant maintenance costs, energy usage, and capital expenditure reductions (via possibly averting an expensive compressor replacement) can be achieved. Facility managers can get a real-time view of the site environment and status of the other RTUs to assess how quickly the repair needs to be completed to ensure customer comfort is not impacted.

Remote Equipment Diagnosis

Remote diagnosis prior to a service visit can save the cost of having a contractor go to the site, diagnose the failure and shut the unit off until replacement parts can be dispatched and repairs can be performed. Understanding the probable nature of the failure can allow facility staff to obtain competitive bids for completing the repair, generating additional cost savings.

Repair & Warranty Validation

An important capability of the EMS is to validate repairs before the service contractor leaves a site. This feature drives poor service performance out of the process, and therefore reduces the average repair costs per site. More importantly, the fact that service contractors are aware that the retailer has this capability often improves quality across all visits. Facility professionals can utilize this information to develop vendor scorecards. Proactive vendors will leverage the information provided by the EMS to improve performance and reduce inefficiencies, reducing their cost, while continued performance problems might spotlight marginal vendors.

For example, a retail site indicated a failure of an HVAC in a shared sales space served by nineteen HVAC units. Prompt dispatch of an HVAC technician to diagnose and repair indicated that failing unit had clogged filters and coils as well as a low coolant charge as a result of a small leak. Discussion with the facility team indicated that this site was under an HVAC preventative maintenance program and should have been serviced the month before the failure of the identified unit. Since the preventative maintenance provider failed to properly provide the PM services for which they were contracted, the unit was repaired at no cost.

Maintenance Vendor Integration

The visibility provided by the Site Controls system enables the retailer's facility team to remotely validate whether repair work was completed properly as well as identify contractor performance trends. Further savings can be



accomplished by providing remote logins to trusted vendors. Extending system access to service contractors affords them the opportunity to determine which items require immediate dispatch versus which items can wait until the next preventative maintenance visit. Such strategies can reduce direct and overhead costs and improve performance, resulting in greater margins for both parties.

Prioritization of Repairs

The enterprise-wide above site visibility provided by the Site Controls platform plays a key role in enabling facilities professionals to prioritize HVAC repairs. For example, an RTU could be turned off remotely until competitive repair bids are obtained for a marginal but expensive performance issue. Prioritization and proper visibility help the facility maintenance crew make better decisions that preserve their budget. They can dispatch to a site in Arizona that has three out of six RTUs down before dispatching to a site in Minnesota with one out of six RTUs down. The Site Controls Exceptions Dashboard automatically prioritizes all locations within a vendor's portfolio of sites by the number of potential issues at a location, allowing rapid identification

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All rights reserved. Printed in USA 434-5837P10 ©2013 Siemens Industry, Inc. and analysis of these trade-offs. This visibility allows managers to prevent budget overruns without jeopardizing customer comfort.

Predictive Maintenance

The 15-minute performance interval data collected and permanently hosted in the Site Controls Data Center provides a rich environment for equipment performance and predictive maintenance studies. For example, instead of scheduling PM visits solely based on a calendar (e.g., each service call occurs at three months interval), facility professionals can begin to tie PM visits based on the actual equipment runtime. This avoids the cost of unnecessary premature visits, while also avoiding catastrophic repairs for units on the verge of failure.

Summary

The effect of EMS on reducing electricity and gas costs at the store level is well documented and easy to understand. What is not as readily apparent, but equally impactful, is the effect of EMS on reducing maintenance spend. By deploying the processes outlined above, facility management professionals can regain control of the HVAC repair budget to reduce energy and maintenance costs, extend asset life and improve productivity.