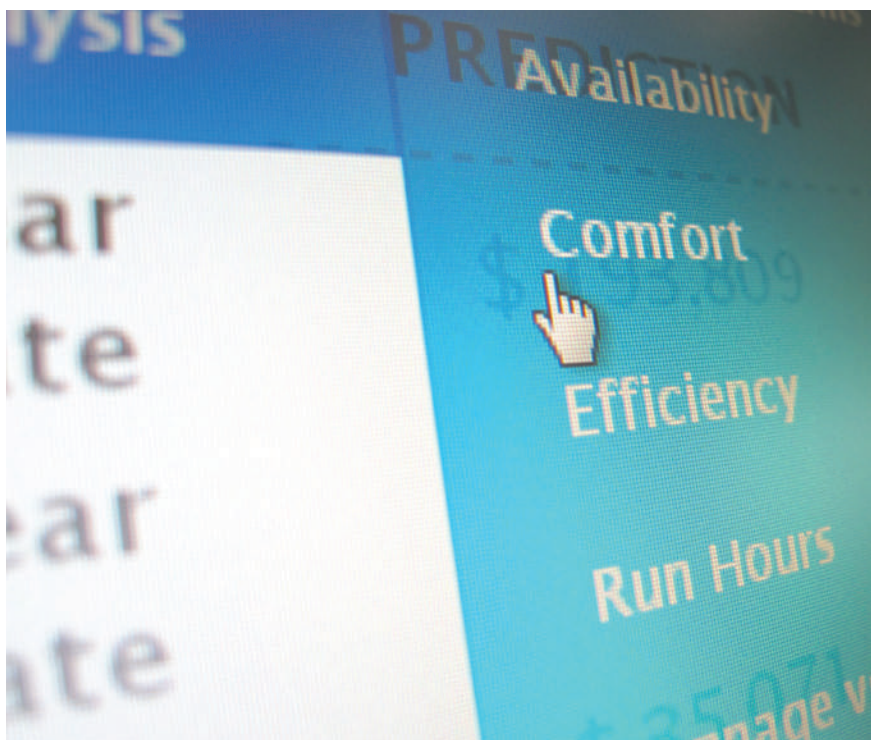


YOUR FUTURE DAILY

ECO*PULSE™

HVAC health
management service



SOLUTION OUTLINE

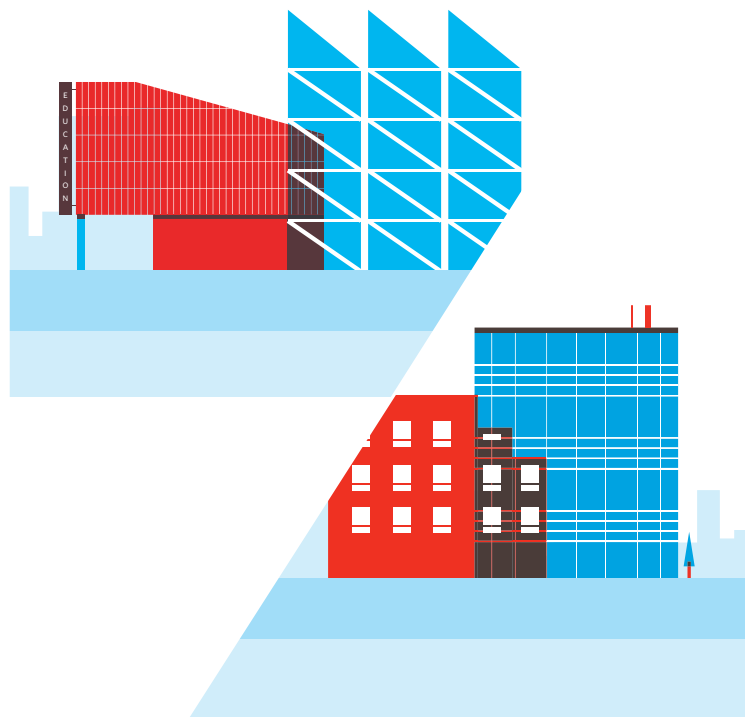
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DATE: JULY 2013

SUPERSEDES: NEW
DATE: NEW

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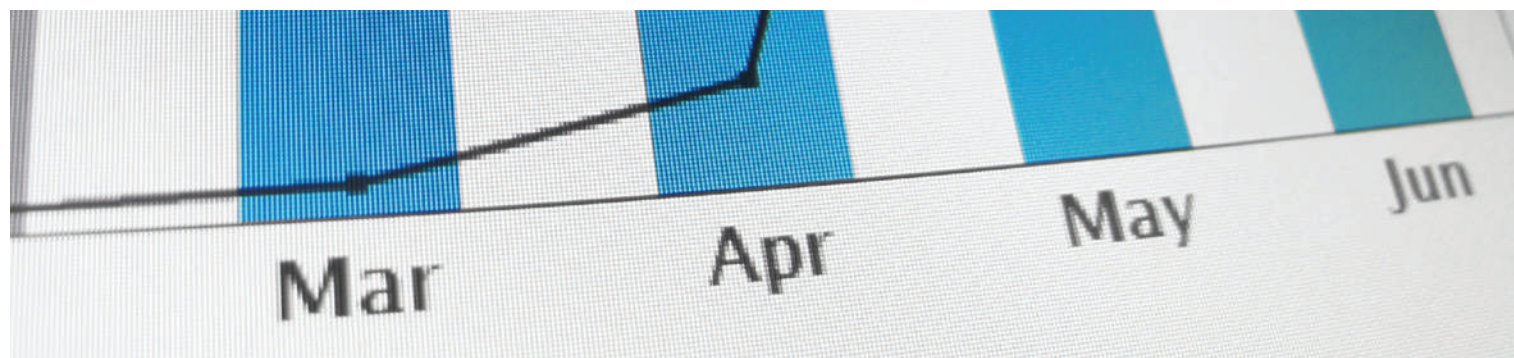
Academy managers know the value and importance of maintaining the performance of their facilities. Managing operating costs, including HVAC maintenance, is a key part of making your business competitive. Managing your HVAC performance for improved occupant satisfaction leads directly to increased revenue and profitability.

The challenge is finding the time to review the volumes of HVAC operating data, and then using that data to decide on the best course of action.



YOUR FUTURE > > DAILY

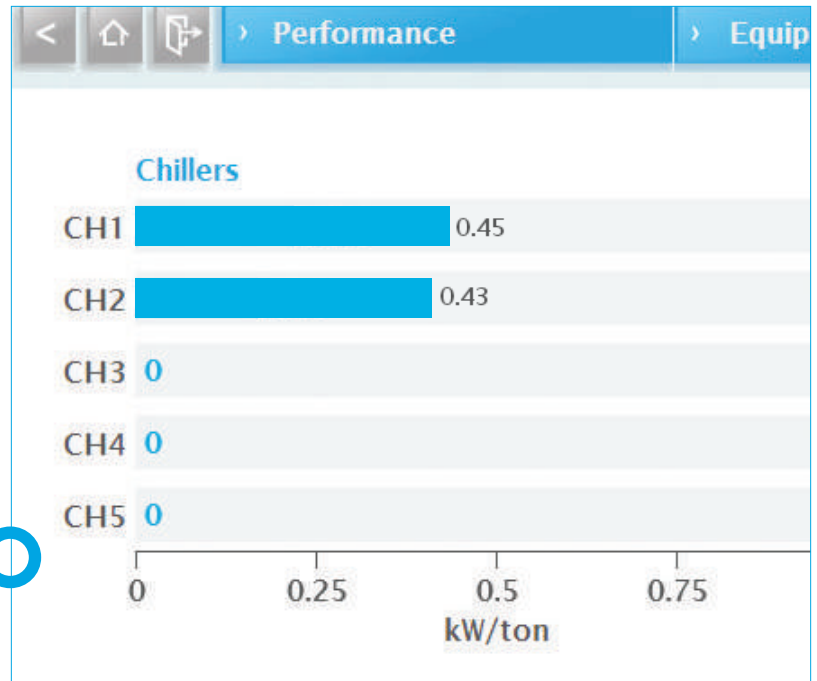
Imagine if you could have a preview of all the key aspects of your cooling system today based on yesterday's performance and the days before that.



That daily insight into your future is now available through ECO*PULSE™ HVAC health management service.

ECO*PULSE™ is a health management service for your building that combines 'deep dive' diagnostics of your HVAC system with expert review.

Coupled with your investment in an Armstrong Integrated Plant Controller or OPTI-VISOR™, the ECO*PULSE™ HVAC Health Management Service from Armstrong helps building professionals like you maintain **optimal operating efficiency** and **minimize costs**. Equipped with timely, accurate data you can manage the health of your building and succeed in a competitive environment.



The screenshot shows the login interface for the ECO*PULSE™ service. At the top right is the ARMSTRONG logo. Below it is a red banner with the text 'ECO*PULSE™'. On the left side, there are input fields for 'Username:' and 'Password:'. Below these fields is a blue 'Login' button with a right-pointing arrow and a small icon. To the right of the login fields is a keyboard icon. On the right side of the screen is a photograph of a modern multi-story building with a glass facade, partially obscured by trees in the foreground.

KEY BENEFITS

With **ECO*PULSE™** you will:

Spend less on energy

Optimize your maintenance programs

Devote fewer resources to understanding and managing your cooling system

Enjoy a more reliable cooling system

ECO*PULSE™ employs analytics software that stays in constant contact with your cooling system and feeds you only the most relevant insights. You benefit from understanding key performance indicators and how they change

The opportunities to reduce costs and improve your business results are considerable.

over time. Most importantly, using this knowledge and the recommendations provided by Armstrong experts, you can optimize your HVAC operating efficiency and maximize your maintenance programs. You can also identify and address maintenance issues before they

grow and become expensive problems. The opportunities to reduce costs and improve your business results are considerable. By eliminating the time required to gather system data and generate reports, ECO*PULSE™ removes the need to constantly check a host of system indicators that may or may not require action. This allows managers and maintenance staff to focus their time and energy on other aspects of building operations.

As part of the ECO*PULSE™ service, Armstrong will help you establish clear priorities for maintenance and operating adjustments. Plus, you'll benefit from expert advice on how to achieve and maintain optimal efficiency.

ECO*PULSE™ efficiency savings

A modest 5% undetected degradation in efficiency can generate substantial costs. The following calculations are based on a sample building with 200 tons of cooling capacity, that might experience a degrada-

tion of efficiency from 0.60 kW per ton to 0.63 kW per ton. ECO*PULSE™ helps building operators avoid efficiency degradation and the related energy costs.

SEASONAL COOLING

2000 ton cooling system

3840 run hours/year (16 hour/day x 30 days x 8 months)

50% average load on cooling system when running

\$.10/kWh cost of power

.03 kW/ton improvement in efficiency

=\$11,500 savings/year

BASELOAD COOLING

2000 ton cooling system

7000 run hours/year

(20 hours/day x 365 days)

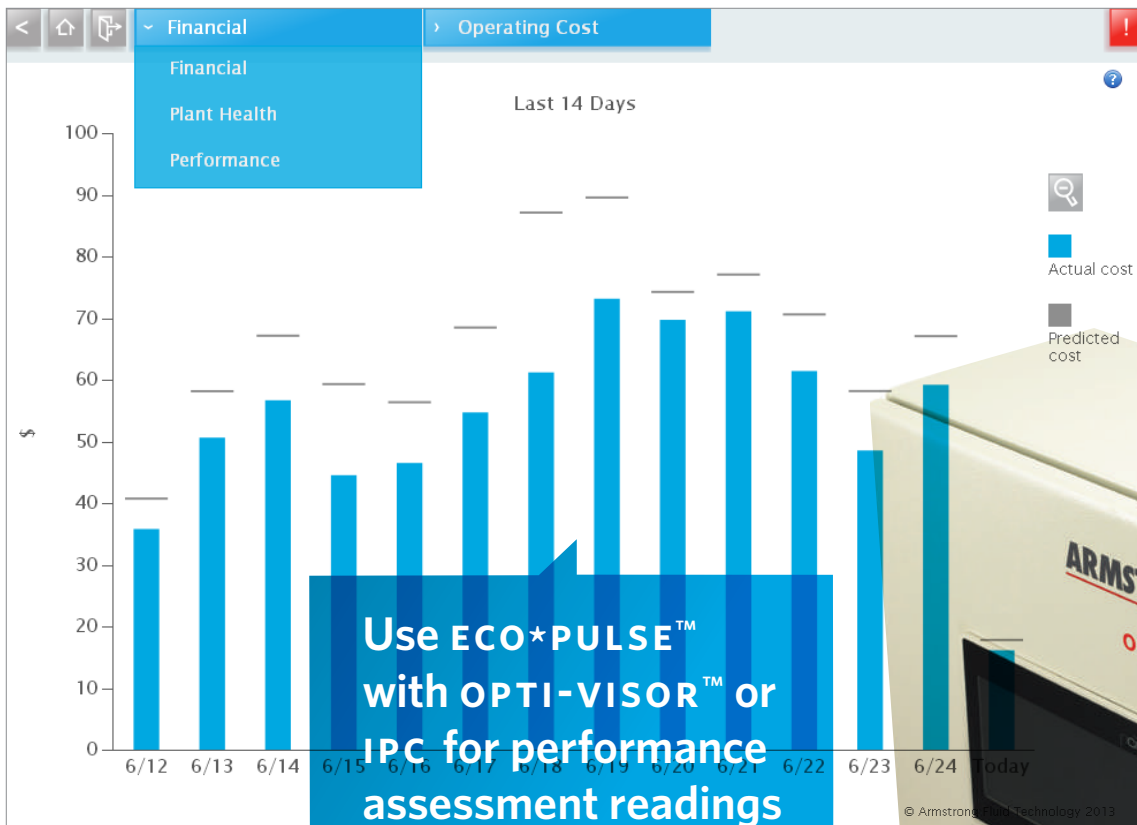
50% average load on cooling system when running

\$.10/kWh cost of power

.03 kW/ton improvement in efficiency

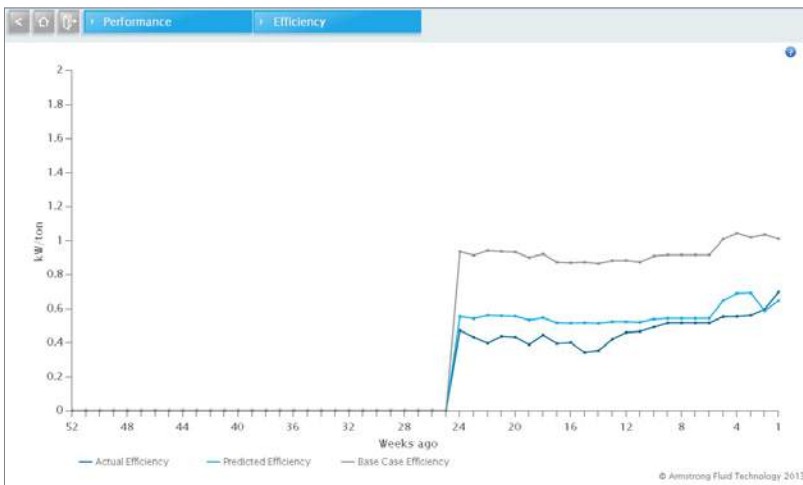
=\$21,000 savings/year

Note that the calculations above do not factor in reductions in maintenance spending or the added value of improved up-time of your cooling system.

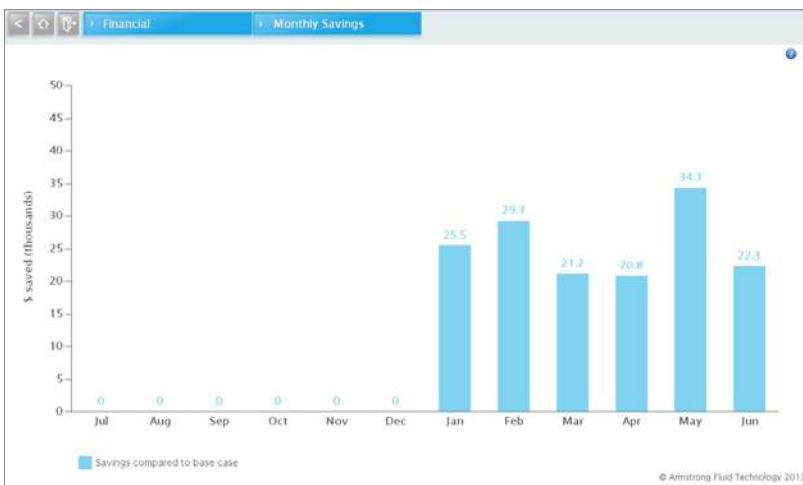




A high-level summary of financial results for month-to-date and year-to-date comparisons.



A time-based graphical display of system efficiency relative to the base case and predicted efficiency. In this example, a 25-week history with ECO*PULSE™.



A monthly summary of savings compared to the base case.

KEY FEATURES

ECO*PULSE™ is a comprehensive combination of real-time diagnostic tools, software and personal service. Key features include:

PERFORMANCE ASSESSMENT

24-7 performance assessment of your cooling system relative to real-time performance expectations for your building and weather conditions

STANDARDS COMPLIANT

Long term operating data collection compliant with the expectations and building performance standards of ASHRAE 189.1

DAILY NOTIFICATION

Daily and/or real-time e-mail notifications with advice to help identify root causes of performance issues

QUARTERLY REPORTS

In-depth quarterly reports with actionable recommendations for preventive maintenance and operating changes

EVALUATION

Easily digestible, insightful evaluations of equipment and system performance

REVIEWS

Regular review of your systems and operating data by industry experts

DAILY SUMMARY

Daily emails on plant efficiency and savings

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For more information, contact your
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MAKING
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SENSE™