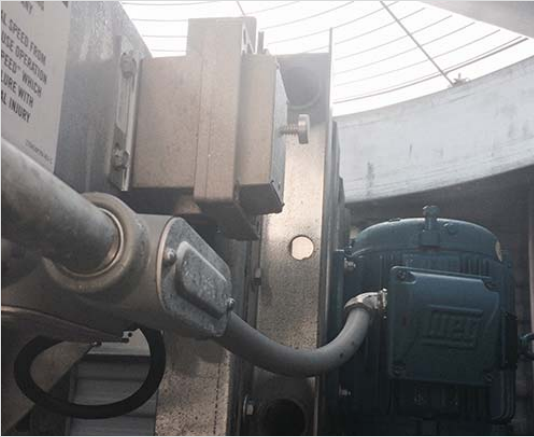


## SERVICE CALLS



**Vibration Sensors** – Cooling tower vibration sensors monitor fans, gear housing, shafts and motors for excessive vibration and provide early warning before a catastrophic failure can occur. An MSC client's vibration sensor recently alerted them to a vibration issue that was traced to a bad bearing, and a costly tower failure was successfully averted.



**Heat Pump** – Large heat pump loops depend on constant circulation for proper heat exchange. Problems with flow, heat exchangers, controls, or cooling towers can jeopardize the loop and shut off heat pumps. During a recent heat wave, a client's backup pump failed to come on during a power outage due to a controls issue, stopping circulation, tripping heat pumps, and shutting off cooling.

## To Repair or Replace: Thinking Beyond Energy Ratings

By Pete McGrath

**When clients are considering replacing their HVAC equipment, MSC is often asked to compare the energy efficiency of old equipment vs. new in order to justify the replacement.** Efficiency is, indeed, a key consideration, but an efficiency rating is only a small part of the equation. There are a number of other important factors that must come into play when determining overall savings.

Many facility owners and managers base decisions largely on efficiency ratings and will often nix replacement when ratings of old and new equipment differ by only a few percentage points. Though repair is often the better choice, savings gained through replacement can be significantly greater when the increased costs of maintaining and repairing older equipment is factored in. Like houses and automobiles (and human beings, for that matter), **HVAC repair costs usually increase with age, and things like bearings, compressors, and gas-fired heat exchangers are increasingly likely to fail as units grow older.**

New warranties, sizeable rebates, and energy incentive programs like New Jersey SmartStart Buildings can be of considerable value and should always be taken into account when deciding whether to repair or replace equipment. The rising cost of R-22 refrigerant is another important consideration, as it is four to five times more expensive than the R-410A used in newer systems. And finally, parts become obsolete as equipment ages, and retrofits can be challenging as well as costly.

### INSIDE...

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- [CATALYST by Transformative Wave: Case Studies](#)
- [System Efficiency / Wireless BAS Controls](#)
- [FIVE Commonly Misdiagnosed HVAC Problems](#)

The bottom line is that energy ratings should never be the main deciding factor when weighing the benefits of repair vs. replacement, as there are many other important elements to consider. MSC is expert in complex HVAC systems in commercial and industrial environments and can help guide clients in making the best choices for their business. **For more information, please call me, Pete McGrath, at 973-294-0343.**

# TECH TALK

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## CATALYST by Transformative Wave - Three Case Studies:

**CATALYST** is an RTU retrofit upgrade that has been proven to reduce HVAC energy use by 25-50%. They can operate as stand-alone units or wirelessly networked via the eIQ Platform. CATALYST can function as a BMS or can be integrated with an existing BMS.

### REMOTE CONTROL – Bartell Drugs

Energy savings: 59%

Bartell Drugs, the nation's oldest family-owned drugstore chain, operates 62 locations in Washington State. The CATALYST and eIQ Platform were installed in 42 stores on 124 HVAC units in order to enable the Facilities Director to have real-time insight and maintain multi-site consistency via remote control. Over the course of one year, Bartell's realized a 59% reduction in HVAC energy use.

### FAULT DETECTION – Whole Foods

Energy savings: 29%

Whole Foods is a four-time recipient of the EPA Green Power Partner of the Year award and a world leader in green practices. As part of a DEP study, five Whole Foods rooftop HVAC units were retrofit with CATALYST. In one case, the eIQ Platform's advanced fault detection and diagnostics identified simultaneous heating and cooling commands coming from one of the units, and correcting the issue resulted in significant energy savings.

### FAN CONTROL/BMS COMPATIBILITY – IKEA

Return on investment: 56%

When IKEA in Renton, Washington was tasked with saving an additional 7% in energy expenditures, facilities staff turned to CATALYST. Because a sophisticated BMS already provided energy-saving features, only the CATALYST Opti-Run fan control was applied to IKEA's forty units. With a 25% utility subsidy and significant energy savings, ROI is 56% and the project paid for itself in less than two years.



## System Efficiency

HVAC operating and performance issues can have a deleterious effect on system efficiency. The #1 offender is lack or absence of preventive maintenance, so be sure to have a good PM program in place.



**Check for leaking ductwork, which can increase blower energy consumption by as much as 50%.** Dirty filters and coils can increase compressor use by up to 30%. Replace one-speed motors with VFDs that change speed automatically. Verify that economizers and occupied/unoccupied modes are properly programmed. Finally, sequence of operation issues can affect system functionality.



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## FIVE Commonly Misdiagnosed HVAC Problems

**As an HVAC and controls service specialist, much of our business comes from clients who are frustrated with other contractors' costly misdiagnoses.** Most misdiagnoses are due to technicians who lack proper training and rely heavily on guesswork, or contractors who make their living replacing expensive parts and equipment rather than diagnosing and fixing the actual issues at hand.

The most commonly misdiagnosed problem, and one of the most costly, is compressor failure. It is extremely important to identify why a compressor failed and correct the underlying problem so the new compressor doesn't fall victim to the same issues. The same goes with premature motor failure. Dirt, improper ventilation, motor overload, voltage irregularities, etc., can cause a host of issues. If cause for failure isn't addressed, the new motor will almost certainly fail as well.



Many HVAC service techs are perplexed by electrical and control issues and CPU faults, and often apply the wrong fix. **"It could be the board" is a vague and insufficient diagnosis.** Problems with airflow and water circulation can also go unrecognized. Improper flow or velocity can cause heat exchange problems, and many technicians don't have the proper knowledge to identify these issues. Finally, recharging low refrigerant is a temporary patch, not a fix. If there is a leak, the source should be identified and remedied to prevent serious damage.

## Wireless BAS Controls

**When BAS wiring presents design and installation challenges, wireless or hybrid systems can often provide an ideal solution.** There are many instances – in remote or inaccessible areas, harsh environments, or historical buildings – where wiring can be difficult, impractical, cost prohibitive, or visually unpleasing. Wireless controls can alleviate or eliminate these challenges by simplifying planning, installation, and setup, and by lowering installation and maintenance costs. Wireless can be used to control major components such as central plant, VAVs, boilers, and lighting, as well as end devices like thermostats and lighting sensors.

**Wireless BAS controls have been found to be just as reliable as wired systems,** and continuing major advancements have virtually eliminated security concerns. Factors to bear in mind when considering wireless devices are building materials and characteristics that may obstruct signals, interference from electronic devices operating within the same radio band, and battery life. Most batteries last about five years and should be replaced as part of a PM program to avoid disruption and downtime.

### DID YOU KNOW...

○ MSC has received an A rating from ISNetworld. ISNetworld is a global resource for connecting corporations with safe, reliable contractors in capital-intensive industries.