

SERVICE CALLS

Voltage imbalance: On three-phase power systems, too much load on one or two phases can cause nuisance breaker trips and VFD faults. MSC technicians found this to be the case when a client's AHU breakers were tripping for no apparent reason. The issue was corrected by taking electrical readings throughout the facility and rebalancing the electrical loads.



Proper positioning of instruments - freeze stats, differential pressure, temperature, etc.- is critical to system performance. Below, a static pressure sensor was improperly mounted after a large elbow, producing turbulent static readings that caused the VFD to ramp up and down. Relocating the sensor two-thirds of the way down the system in a straight duct allowed the VFD to run smoothly and eliminated large airflow fluctuations.



COMPRESSOR AUTOPSY: What Went Wrong

"Bring that compressor back to the shop and tear it down", comes the order from Mechanical Service Corporation owner Harry Hartigan.

When a compressor fails prematurely, getting someone to replace it is only half the battle. Having someone determine exactly why a compressor failed is just as important. MSC performs autopsies on all failed semi-hermetic and screw compressors so a repeat failure can be avoided – and a good deal of the time, it can. More often than not, compressors are killed by system problems, not by a defect in the compressor itself.

Did the compressor overheat? Was it oil or refrigerant slugging? Could it have been an electrical failure? Was it lack of lubrication, or maybe an acid burnout? Through the years, MSC has found out why a compressor failed for countless clients and made changes to their systems in order to prevent a disruptive and very-costly cycle of repeated compressor failures, upset, and finger-pointing.

Tearing down a compressor isn't quite as easy as taking out a "wrenched ankle" in the old board game "Operation" from long ago. After the compressor is torn down, motor windings are examined for nicks and cylinder walls are examined for scoring. Sometimes, pieces of pistons and connecting rods are found in a heap in the bottom of the oil pan. A thorough post-mortem, along with a complete set of refrigeration readings at the start-up of the new compressor, makes all the difference in the world for the life span of the replacement compressor.



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Ice Thermal Storage: Old Technology, New Popularity

Ice thermal storage is not a new technology, having been used in the dairy industry since the 1930s, but it is surging in popularity as a way to save energy and reduce one's environmental footprint. Utilizing low-temperature water from ice built during overnight off-peak hours can substantially lower utility costs in commercial, industrial, and now even residential applications.

Ice thermal storage systems rely on inexpensive nighttime electricity to make ice inside storage tanks, which is then melted to provide a steady source of chilled water during peak daytime hours. Air conditioning can demand huge amounts of energy during peak hours, and day-to-night kWh costs can vary by 500 to as much as 1,000 percent. **Because ice thermal storage shifts the demand to off-peak hours, energy savings are very substantial.**

The up-front costs of ice thermal storage systems are usually the same or lower than that of traditional systems due to the fact that they require smaller chillers, cooling towers, pumps, and piping than the traditional system. Ductwork, fans, and motor sizes can be reduced as well. Since smaller equipment requires less connected horsepower, peak-hours electrical demand can be lowered by 50 percent or more. Additionally, chillers are inefficient when run at low loads, and during spring and fall - about half the year - they typically operate at about one-third capacity. Smaller ice system chillers are operated at full load, maximizing their efficiency.



Other beneficial factors in favor of ice thermal storage are ease of maintenance due to lack of moving parts and smaller chillers, pumps and other equipment, as well as increased system reliability. Ice storage systems typically utilize two chillers that provide about sixty percent of the required cooling each day, with the stored ice providing the remaining forty percent. In the event one chiller fails, seventy percent of the usual cooling capacity will still be available, as opposed to a maximum of fifty percent from a traditional two-chiller system when one of them fails.

For more information on how ice thermal storage systems can help you save money and energy while reducing your carbon emissions, please contact MSC at 973-884-5000.

TECH TIDBIT...

○ **Wireless technology** continues to increase in popularity for building automation, security, and lighting systems. With rapid improvements in battery life, security, reliability, and integration, users are embracing the flexibility, energy savings, and many other advantages WiFi has to offer over traditional wired systems.



TECH TALK

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Prevent PM Budget Cuts with Hard Facts & Figures

Every good facility manager knows that preventive maintenance is absolutely critical to the efficiency and longevity of an HVAC system. And many facility managers have experienced the frustration of having their PM program downscaled or cut entirely due to budgeting decisions made by upper management. More often than not, this is due to the fact that they are not supplied with the necessary data to make an informed decision. Preventive maintenance, when represented as a static dollar amount with no attached value, practically begs to be cut from an overhead budget.

Ensuring that your PM program budget is safe can be accomplished by educating decision-makers with concrete facts and figures demonstrating the ROI of preventive maintenance vs. deferred maintenance, reactive repairs, and premature equipment replacement. Chillers, for example, commonly fail at 15 years with lack of PM, while properly-maintained chillers typically last 20-25 years, and sometimes as long as 30 years. Calculated over time, this can account for savings in the tens, or even hundreds, of thousands of dollars. Poorly-maintained systems consume far more energy than those that receive regular PM, and frequent repair expenses can add up to alarming numbers.



We often hear facility managers lamenting budget cuts, not realizing that the situation could have been avoided had they provided decision-makers with accurate and compelling facts about their building systems. *If you need assistance, please contact MSC's Pete McGrath at 973-884-5000.*

Smooth Your Transition to Heating Season

Autumn is the time to prepare for heating season with preventive maintenance. Besides the all-important belt and filter changes, MSC recommends inspecting your heat exchangers, balancing hydronic systems, checking heat pump systems, and checking heating controls. Also, make sure economizer cycles are properly programmed and working correctly to take advantage of cooler nighttime temperatures. Autumn is also the ideal time to perform retro-commissioning, which can extend equipment life, reduce downtime and repairs, and provide substantial energy savings.



DID YOU KNOW...

○ In a recent Facility Maintenance Decisions magazine survey of 550 of in-house maintenance and engineering managers, 32.9% characterized the state of deferred maintenance issues at their facility as "major", and 2.2% considered issues to be at "crisis" level.