mechanicalservicecorporation

TECH TALK

MSC - THE ONLY TRUE HVAC SERVICE COMPANY - WE FIX IT

NEWSLETTER - APRIL 2016

973-884-5000

SERVICE CALLS

Boiler Shutdown: During a severe cold snap a set of condensing high efficiency modulating boilers were shutting down and locking out when they were needed most in single digit weather. The water vapor in the combustion gas was freezing due to the length of the outside exhaust pipe. Also the condensate drain line was plugged with sediment due to lack of yearly cleaning and preventive maintenance. Condensing boilers depend on proper installation, control, line sizing and good PM to perform properly.

Voltage Spikes & Dips: MSC was called in to investigate a series of puzzling HVAC system problems affecting VFDs and various instruments. Technicians suspected that voltage dips, spikes and surges were wreaking havoc on the BAS, despite the presence of a UPS (uninterruptible power supply) to regulate voltage and provide emergency power in case of failure. Sure enough, the UPS was found switched to "bypass". The UPS was reengaged, and all issues were rectified.

COOLING MRI SUPERCONDUCTORS

Magnetic resonance imaging, or MRI, is an invaluable medical device that uses a strong magnetic field and radio waves to create detailed images of organs and tissues within the body. The scanner's bore, through which a patient is moved, is surrounded by a superconducting magnet consisting of coils of wire through which a current of electricity is passed to create a strong, uniform magnetic field. Superconductivity is the phenomenon of near-perfect electrical resistance that occurs at temperatures approaching absolute zero. In an MRI, this is achieved by bathing the windings in liquid helium at 452.4 degrees below zero Fahrenheit. The superconducting magnet causes hydrogen atoms in the body to align in one direction, either north or south. A radio pulse is then applied, causing the atoms to momentarily relax. This "resonance" is captured and used to create MRI images.

With MRIs (as well as other medical equipment like linear accelerators and CAT scan machines), downtime is not an option. Reliable cooling is absolutely critical to the uninterrupted operation of MRI equipment, so it is supremely important that chillers maintain tight temperature control and proper flow. Chiller preventive maintenance should be performed at least quarterly and preferably once a month to ensure unfailing and efficient operation. Medical chillers should always be on emergency power, and redundant systems with lead/lag control are highly encouraged whenever possible. Chillers commonly used for MRI application include Mokon, Kraus, and Thermal Care.

As a leading HVAC and process cooling service subspecialist, MSC provides a level of expertise that can virtually eliminate MRI chiller downtime. For more information, call us at 973-884-5000.

INSIDE...

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HISTORY OF REFRIGERATION

Refrigeration is an invention that has unquestionably changed our lives. The earliest methods of refrigeration were very basic, often consisting of harvested ice or snow stored in cellars. Still, rapid food spoilage was nearly impossible to prevent, and the bulk of the average American diet consisted of bread and preserved meats.

During the first half of the 19th century, as the country expanded, cities grew, and economic status improved, demand for fresh food and refrigeration increased. An entrepreneur named Frederic Tudor revolutionized the ice industry by developing insulation, storage, and transportation methods that kept melting losses to a minimum, and the ice trade flourished.

As time went on, uncontaminated natural ice sources became increasingly difficult to find, and an increasing need for other means of refrigeration sped development of mechanical systems. As the largest consumers of natural ice, the brewing industry began using gas absorption systems in the 1870s, and almost all breweries were using mechanical refrigeration by 1891. The meat packing was the next to embrace refrigeration, and by the early 20th century, most meat packing plants were using ammonia compression systems. Meat packers were also instrumental in the development of refrigerated rail cars, making it possible to safely ship perishable food products long distances.

Because early refrigerants like ammonia, sulfur dioxide, and methyl chloride were difficult to work with and often toxic, one of the most important advancements in modern refrigeration was made when Frigidaire discovered chlorofluorocarbons and released Freon in 1930. The household refrigerator quickly becoming an essential household appliance, and by 1950 more than 80% of farms and 90% of urban households owned a refrigerator.

KEEP IT CLEAN, KEEP IT GREEN

It's the time of year again to replace winter filters and clean evaporator coils, condensing coils, and drain pans. Cooling towers and tower water filtrations systems should be cleaned and tested. Flush and blow out chilled water systems and clean strainers. The same goes for reheat hot water systems. Check for refrigerant leaks in all DX systems. This is the swing season, when we run cooling during the day and heat at night, so make sure your economizer cycles are programmed correctly. Lastly, make sure all systems operate to their design intent. This is the best way to conserve energy and extend equipment life. *Remember, when you keep it clean, you keep it green.*

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RETRO COMMISSIONING - THE PROCESS

Retro-commissioning is the application of the commissioning process to existing buildings in order to improve how mechanical, electrical and controls systems function interactively to enhance overall building performance.

The ultimate goal of retro-commissioning is to ensure that a building is meeting the unique needs of its owner and occupants while operating as efficiently as possible. It can resolve problems that occurred during design or construction, or address problems that have developed over time. Commercial buildings frequently undergo operational changes that can challenge systems and hinder optimal performance. Today's control systems can be highly complex, and small problems can trickle down and significantly affect building operations. Time takes a toll, as well; even well-constructed and properly maintained buildings and systems will experience performance degradation over time, affecting system dynamics and hampering efficiency.

Retro-commissioning provides a wide array of benefits to a building owners, managers and occupants. **Typically retro-commissioning saves owners 10-20% of total building energy costs.** Most improvements do not require expensive retrofit and can be achieved through controls changes alone.

Benefits include:

- ⇨ Improved equipment performance
- ⇨ Better system manageability
- ⇨ Improved documentation and staff training
- ⇨ Improved indoor environmental quality
- ⇨ A more comfortable work environment

TECH TIDBIT...

❍ MYTH: You shouldn't lower your thermostat at night because you'll use more energy heating the house up again. FACT: As soon as your house drops below its normal temperature, it loses heat more slowly. The lower the interior temperature, the slower the heat loss. The longer your house remains at a lower temperature, the more energy you save, because your house has lost less energy than it would have at higher temperature.

MSC is a retro-commissioning specialist. If you would like to find out more about how retro-commissioning can help you save money and energy, please contact us at (973) 884-5000.