C&W SERVICES

12 TIPS FOR COOLING AND AIR FLOW PRACTICES

FOR ENERGY-EFFICIENT FACILITY MANAGEMENT

Renewed focus on "E" in ESG (Environmental, Social and Governance) has put the spotlight on efficiently operating facilities. Facility managers and executives are constantly looking for ways to reduce energy usage, energy spend, greenhouse gas (GHG) emissions and identifying sustainability solutions. The potential solutions to achieve goals may include infrastructure upgrades (retrofits, replacements, technology updates) requiring extensive capital funding needs.

While these projects may be essential to improve the facility energy portfolio, reduce energy consumption, reduce GHG emissions and improve energy rating certifications such as ENERGY STAR, LEED, etc. The organization may not have the desired funding levels available to accomplish the projects identified. Additionally, many facility managers may not have access to energy specialists for guidance and support.

Below we identify energy and sustainability practices and cost-effective solutions that can be easily implemented or coordinated by maintenance teams to supplemen ctices that will enable facility management teams to improve facility energy utilization and preserve the life of cooling and airflow equipment with the summer months here.

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1 **Outdoor Air Temperature Lockout Setpoints:** The outdoor air temperature lockout setpoints are beneficial to reduce unwanted energy consumption. Identifying the balance point (when the facility does not require heating or cooling) determines the lockout setpoints. The cooling system lockout will disable the cooling system equipment from operating when the outdoor air temperature drops. Programming Building Monitoring Systems (BMS) for the lockout setpoints effectively ensures the proper implementation of lockout controls.

2 **Chilled Water Piping and Refrigerant Line Insulation:** Hot weather stresses chilled water systems, especially unconditioned spaces in hot and humid environments. Ensuring proper insulation of chilled water pipes and refrigeration lines prevents temperature losses and helps protect against massive equipment failures, and minimizes health concerns (due to potential mold formations).

3 **Chilled Water Temperature Reset:** Resetting chilled water temperature will increase chilled water supply temperature depending on demand. Based on demand requirements and outdoor air temperatures, programming the Building Monitoring System (BMS) reset sequence reduces the load on chillers. It saves energy by leveraging beneficial outdoor environmental conditions.

4 **Condenser Water Temperature Reset:** Chillers consume a high amount of energy to move refrigerant from low pressure (evaporator) to high pressure (condenser). Maintenance teams can achieve a reduction in the pressure differential by resetting and lowering the condenser water temperature. Programming the BMS to reset condenser water temperature will reduce the load on the compressor, consuming less energy and increasing operating efficiency.

5 Occupancy Driven Space Temperatures: A standard policy and stable range of consistent space temperature during high and low cooling requirements (occupied and unoccupied hours) are essential for building occupant comfort and energy savings. The maintenance teams can program the BMS systems and locally installed thermostats to ensure and enable local space temperature policy compliance. The HVAC systems should be reset, reprogrammed, and minimized during unoccupied facility hours.

6 Discharge Air Temperature Reset: The discharge air temp-erature controls humidity levels during the hot season by cooling the air stream and condensing the water out of the air using cooling coils. A reset on discharge air temperature during moderate temperatures or part load conditions reduces compressor utilization, reducing energy consumption.

7 Static Pressure Reset: Programming the BMS to adjust the AHU supply fan static pressure setpoint during low cooling loads will allow efficient operation of the fans. A thorough analysis and understanding of the usage trends before establishing the adjustment automatic adjustment in BMS and resetting static pressure results in significant savings in fan energy consumption.

8 Demand-driven ventilation control: BMS can be programmed to automatically reduce the warm outdoor air intake, based on occupancy and ventilation demands to ventilate the building (especially during non-occupancy hours) properly. Reducing outdoor ventilation makes it unnecessary to cool the additional warm outside air, resulting in lower energy consumption.

9 AHU/RTU Filter change based on pressure differential: Establish and implement the policy and practice to replace air filters based on manufacturer-recommended pressure differential instead of a frequency-based filter change. Clogged filters prevent effective air cleaning and cause additional energy consumption for HVAC fans. The installation of simple pressure sensors to measure the pressure drops allows teams to identify the appropriate time for a filter replacement.

10 Manage Air Dampers during unoccupied hours: Outdoor air ventilation consumes a significant percentage of energy consumed in an Air Handling Unit. Programming the outside air dampers to close during unoccupied hours to the extent necessary for maintaining positive building pressure (with proper monitoring) will minimize this energy consumption.

11 Rooftop Unit Tune-Up: Roof Top Units (RTU) are sometimes considered low priority equipment. As a result, the routine preventive maintenance activity may not include quality tune-up plans, resulting in increased energy utilization. Establishing quality tune-up plans and providing RTU controls training to maintenance technicians reduces RTU energy utilization and preserves equipment life. A quality tune-up should include proper coil cleaning, refrigerants refilled and checked for leaks, and sensors adequately calibrated.

12 Air Handling Units (AHU) Controls Tune-Up: Providing AHU tune-up reduces energy utilization and preserves equipment life. Quality AHU tune-up should include verifying the proper functioning of air dampers and actuators and their response to Building Automation System (BAS) commands. Additionally, the operation of sensors and gauges (temperature, humidity, pressure, thermostats, etc.) must be verified and calibrated.

These recommendations may be implemented by the site facility management team or coordinated through a sub-contractor. Implementing these practices will enable the facility teams to supplement the energy goals by reducing energy waste, improving energy efficiency, and preventing costly equipment failures.

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