T o a commercial real estate property owner or manager, a properly maintained and energy efficient HVAC system is essential. A building that is too warm or cold, or an electricity bill that is too high, is bad business and creates difficult questions from management and tenants.

Many people overlook the role a clean cooling tower plays in the performance and energy efficiency of a building’s cooling system. In a typical building, the HVAC system accounts for about 45% of utility costs, with the chiller being the single largest consumer of electricity. Since chillers use about five times the energy of the cooling tower, more attention is usually paid to the chiller. However, maintaining a clean cooling tower is equally important in the energy efficiency equation.

**CLEANER = ENERGY EFFICIENT**

Because cooling towers are efficient air washers, they require regular cleaning to remove the dust, pollen, insects and other debris captured as the tower water falls through the air stream. These contaminants are carried through the tower fill and tend to settle in the basin where they contribute to all kinds of problems. Basin deposits provide an ideal environment for the growth of microorganisms that can cause severe under-deposit corrosion and even basin failure. Some microorganisms can pose a health risk to maintenance personnel and passersby, especially if released from the tower in the form of aerosols.

Dirty cooling towers also do not cool water as efficiently as clean cooling towers. Fouled air inlet louvers fill and spray nozzles, reduce heat transfer, and require the tower fans to operate longer to provide the required condenser water temperature. Clogged suction strainers reduce condenser water flow and chiller capacity. Chiller efficiency is reduced if the design condenser water temperature cannot be supplied. For every 1ºF the condenser water supply temperature rises above design, chiller efficiency is reduced by 2%. To compound the problem, accumulated tower debris delivered to the chiller with the condenser water contributes to condenser fouling, which further reduces chiller efficiency.

Routine cooling tower cleaning and chlorination is important preventative maintenance to avoid
these problems. Most cooling tower manufacturers recommend that this be done at least twice a year.

**PROPER CLEANING PROTOCOL INVOLVES:**
- Chlorination to achieve an effective residual
- Cleaning spray nozzles and orifices
- Application of a cleaner to remove louver and fill deposits
- Washing down tower surfaces and basin with a high pressure washer
- Vacuuming the tower sump
- Proper disposal of debris

Although important, cooling tower cleaning is often neglected or performed improperly. It is a labor intensive process that requires expertise and training to accomplish correctly. Specialized equipment and procedures are necessary to effectively perform the work. The chlorination procedure, which helps reduce the risks from waterborne pathogens, requires careful application and control. The louver and fill cleaning procedure, which helps maintain good air flow and heat transfer in the tower, requires specialized cleaners and application equipment. Workers must wear the proper personal protective equipment (PPE) to avoid chemical and microbiological hazards. Depending on the tower design and location, specialized equipment may be required to safely access spray nozzles, air inlet louvers and fill.

**CLEANER IS GREENER**

Many building owners do not have the in-house resources to properly perform tower cleanings and choose to contract with an outside company for this work. Using the services of a qualified cooling tower cleaning company provides assurance that the work is performed safely using industry recognized procedures. Documentation should be provided outlining the cleaning and chlorination procedures and the results of each job. Keep in mind some contractors only physically clean the basin and their services do not include chlorination or louver/fill cleaning.

Routine cooling tower cleaning and chlorination is an important, cost-effective preventative maintenance practice. It helps reduce energy costs by keeping cooling towers and chillers operating at peak efficiency. Clean cooling towers also last longer and operate more reliably. Although sometimes overlooked in the energy efficiency equation, regularly cleaning cooling towers really pays off.