



## **Zaneta Williams - Don't let your system give you a "cold shoulder" - Spring is the best time for cooling tower maintenance**

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Unlike other mechanical systems, cooling tower maintenance and repair has a limited window of opportunity for service because they require clear weather conditions and it is preferred for them to be serviced before the cooling season because the system must be put out of service for repair. Therefore the spring is the best time to check belts, oil levels, gear boxes, fans and motors.

Cooling towers are heat exchangers that use water and air to remove heat from air-conditioning systems into the atmosphere. They are normally used to remove heat from the condensate water as it leaves a chiller. Cooling towers are usually located on rooftops of multistory buildings or other outdoor sites. They are often neglected by operation-and-maintenance technicians, because they are frequently out of sight, and precarious to service, thus resulting in lower cooling-system efficiency which ultimately increases energy expenses as well.

Reducing energy expenditures for your cooling tower may be as simple as regular maintenance. An improperly maintained cooling tower will produce warmer cooling water, resulting in a condenser temperature 5 to 10 degrees F higher than a properly maintained cooling tower. This reduces the efficiency of the chiller, wastes energy, and increases cost. The chiller will consume 2.5 to 3.5% more energy for each degree increase in the condenser temperature.

For example, if your chiller uses \$15,000 of electricity each year, it will cost you an additional \$500 to \$700 per year for every degree increase in condenser temperature. Thus, for a 3 to 10 degree F increase, you can expect to pay \$1,500 to \$7,000 a year in additional electricity costs. In addition, a poorly maintained cooling tower will have a shorter operating life, is more likely to need costly repairs, and is less reliable.

The performance of a cooling tower degrades when the efficiency of the heat transfer process declines. Some of the common causes of this degradation include:

### **Scale Deposits**

When water evaporates from the cooling tower, it leaves scale deposits on the surface of the fill from the minerals that were dissolved in the water. Scale build-up acts as a barrier to heat transfer from the water to the air. Excessive scale build-up is a sign of water treatment problems.

### **Poor Air Flow**

Poor air flow through the tower reduces the amount of heat transfer from the water to the air. Poor air flow can be caused by debris at the inlets or outlets of the tower or in the fill. Other causes of poor air flow are loose fan and motor mountings, poor motor and fan alignment, poor gear box maintenance, improper fan pitch, damage to fan blades, or excessive vibration. Reduced air flow due to poor fan performance can ultimately lead to motor or fan failure.

### **Poor Pump Performance**

An indirect cooling tower uses a cooling tower pump. Proper water flow is important to achieve optimum heat transfer. Loose connections, failing bearings, cavitation, clogged strainers, excessive vibration, and non-design operating conditions result in reduced water flow, reduced efficiency, and premature equipment failure.

To keep the cooling towers running at optimum efficiency, create and maintain a regular maintenance schedule which will keep your mechanical parts operating effectively.

- \* Check the belts for signs of wear and tear, inspect all moving parts such as drive shafts, pulleys, and belts. Adjust belts and pulleys.
- \* Lubricate bearings and bushings. Check the level of oil in the gear box. Add oil as needed.
- \* Operate the water float switch manually to ensure proper operation.
- \* Inspect motor supports, fan blades, and other mechanical parts for excessive wear or cracks, check for excessive vibration
- \* Inspect the fan for bacterial growth and check the belts for proper tension. Adjust the tension if necessary.
- \* The fan motor will run in cycles as needed and will shut down when cooling is complete. You should run the fan motor continuously using the control panel to switch it from auto. Run it for three hours at least once each month to dry out moving parts and lubricate the bearings
- \* Every three months you should lubricate the fan shaft bearings by turning the rotating parts by hand and then greasing the bearings.
- \* Check the fan's belt tension and condition the belt thoroughly for signs of wear or damage. Replace it if necessary. Inspect bolts in the fan and mechanical equipment and tighten them.
- \* Annually you should inspect the entire tower thoroughly. Clean away debris from the collection points inside the tower and check the hot water system for algae and silt. Lubricate the fan's motor and fan shaft bearings and change the drive belt if you notice excessive wear such as tearing or thinning.

Pump & Motor Corp. has the expertise in all phases of mechanical repair for your cooling tower. Call today for a free site survey.

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