

## Cooling Towers

- ◆ Control cooling tower fans based on leaving water temperatures.
- ◆ Control to the optimum water temperature as determined from cooling tower and chiller performance data.
- ◆ Use two-speed or variable-speed drives for cooling tower fan control if the fans are few. Stage the cooling tower fans with on-off control if there are many.
- ◆ Turn off unnecessary cooling tower fans when loads are reduced.
- ◆ Cover hot water basins (to minimize algae growth that contributes to fouling).
- ◆ Balance flow to cooling tower hot water basins.
- ◆ Periodically clean plugged cooling tower water distribution nozzles.
- ◆ Install new nozzles to obtain a more-uniform water pattern.
- ◆ Replace splash bars with self-extinguishing PVC cellular-film fill.
- ◆ On old counterflow cooling towers, replace old spray-type nozzles with new square-spray ABS practically-non-clogging nozzles.
- ◆ Replace slat-type drift eliminators with high-efficiency, low-pressure-drop, self-extinguishing, PVC cellular units.
- ◆ If possible, follow manufacturer's recommended clearances around cooling towers and relocate or modify structures, signs, fences, dumpsters, etc. that interfere with air intake or exhaust.
- ◆ Optimize cooling tower fan blade angle on a seasonal and/or load basis.
- ◆ Correct excessive and/or uneven fan blade tip clearance and poor fan balance.
- ◆ Use a velocity pressure recovery fan ring.
- ◆ Divert clean air-conditioned building exhaust to the cooling tower during hot weather.
- ◆ Re-line leaking cooling tower cold water basins.
- ◆ Check water overflow pipes for proper operating level.
- ◆ Optimize chemical use.
- ◆ Consider side stream water treatment.
- ◆ Restrict flows through large loads to design values.
- ◆ Shut off loads that are not in service.
- ◆ Take blowdown water from the return water header.
- ◆ Optimize blowdown flow rate.
- ◆ Automate blowdown to minimize it.
- ◆ Send blowdown to other uses (Remember, the blowdown does not have to be removed at the cooling tower. It can be removed anywhere in the piping system.)
- ◆ Implement a cooling tower winterization plan to minimize ice build-up.
- ◆ Install interlocks to prevent fan operation when there is no water flow.
- ◆ Establish a cooling tower efficiency-maintenance program. Start with an energy audit and follow-up, then make a cooling tower efficiency-maintenance program a part of your continuous energy management program.