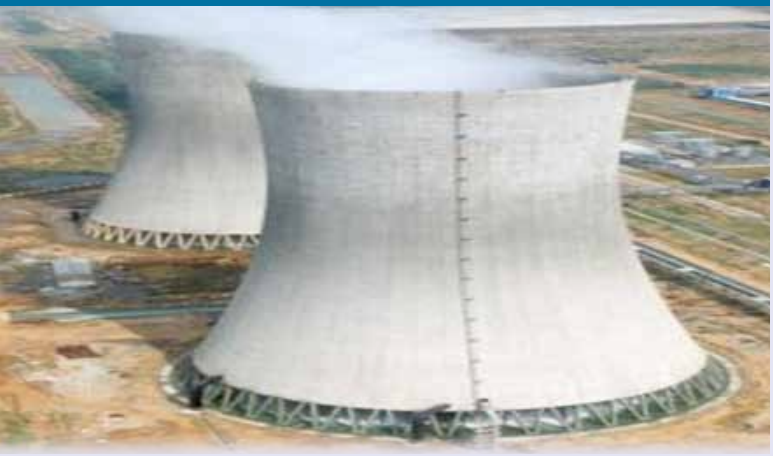
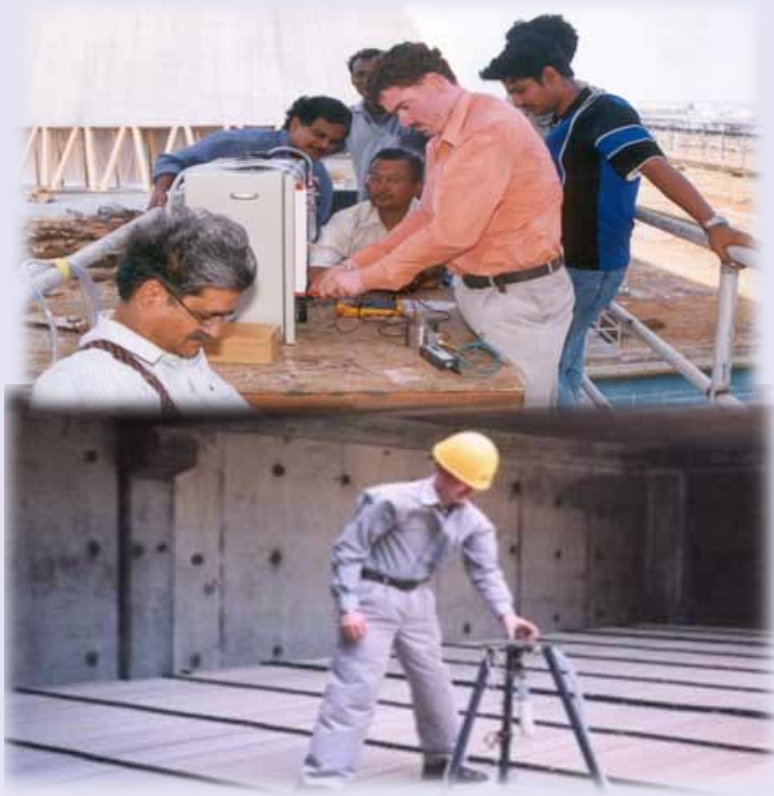
NATURAL DRAFT COOLING TOWER



INDUCED DRAFT COOLING TOWER

WATER FLOW MEASUREMENT USING PITOT TUBE

DRIFT LOSS TEST



SPECIALISTS IN:

* Cooling tower thermal/structural/mechanical audits

* Cooling tower up-gradation, retrofitting, refurbishment of any type, any make cooling towers

* Design/manufacturing, supply, erection, commissioning, testing of new cooling towers

* Spare parts of any type, any make cooling towers

FRP FAN STACK

FAN BLADES

NIRVANA TECHNOLOGIES
213, Goyal Trade Center, Opposite HDFC Bank
Shantivan,Borivali East, Mumbai 400066
Tel: +91-22-28280131/+91-9987799270
Email: mahesh_kul2@yahoo.com; info@nirvanatechnologies.co.in
Web: www.nirvanatechnologies.co.in

Impact of Cooling Water Temperature on Plant Performance

The cooling tower is generally neglected in most plants. The plant operator assumes that this equipment should run without much care. The cooling tower only comes into the limelight if proper vacuum is not achieved, which in turn begins affecting the plant process and thus hits the bottom line of business.

Let us take the example of sugar industry. An efficient cooling tower gives better cooling to the condenser, which in turn improves condensation of vapour in the condenser. This results in increased vacuum in evaporators and pans, and reduces boiling point temperature of juice. The latter thus needs less amount of steam for boiling, ultimately saving bagasse and leading to fuel economy. In turn, the bottom line will improve. Hence, cooling tower performance is directly related to profits.

The same is the case of power industry. Improvement in cold-water temperature (outlet temperature) of cooling tower by 2-3 deg C will lead to improvement in condenser vacuum by 6-9 mm hg, which improves heat rate by 12-18 kCal/kWh. This, in turn, results in reduction of fuel consumption by 1,500 tons per year for a 50 MW cogeneration unit.

In totality, for sugar and cogeneration power plant operations, an efficient cooling tower is one of the best tools to improve a company's bottom line.

Steps to Improve Efficiency

In order to improve efficiency of a cooling tower, these points need to be taken care of:

- Regular in-house maintenance of cooling tower is mandatory, by carrying out the following:

    1) Regular checkup of the mechanical equipment – proper blade angle setting, proper alignment of gearbox, drive shaft, motor, etc.

    2) Cleaning of water distribution system, header, laterals, nozzles, etc.

    3) Cleaning of choked fills.

    4) Maintaining design blade angle in the fan in order to maintain design power consumption in the fan motor. Sometimes, few suppliers convince the plant operators to reduce auxiliary power consumption by providing VFDs (variable frequency drives) or equivalent systems. But they don't realize that they are going to compromise on cooling tower performance by operating cooling tower fans at low rpm. Such systems will be useful only when there is no load or fewer loads. But in that case too, auxiliary fan power consumption can be saved by operating the cooling tower partially (in case of multi-cell cooling tower), which is normally present in every plant.

By carrying out the above-mentioned preventive maintenance of cooling towers, even if cooling tower performance is not up to the mark, it is better to get the existing cooling tower evaluated by experts and carry out the required modifications in order to achieve better cooling tower performance, and thus better vacuum, reduced fuel, and improved profits.

Author:
Mahesh M. Kulkarni
Nirvana Technologies
213, Goyal Trade Center, Sona Talkies
Shantivan, Borivali – East
Mumbai 400066
Tel: 022-28280131;
09987799270
Email: mahesh_kul2@yahoo.com;
info@nirvanatechnologies.co.in
Web: www.nirvanatechnologies.co.in