Sand filter system keeps cooling water clean; eliminates tower downtime

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New Solutions to Plant Problems

Problem: Water circulating through a cooling tower scrubs dust and other atmospheric particulates from the air. The cooling tower at ARCO Oil & Gas Company, Plano, TX, serves a computer/data processing complex which has a 2000 ton air conditioning system, normally operating at about 70% capacity, that is required to provide temperature-humidity control for the operation of the computers and associated electronic equipment. The water is circulated by a 300 hp pump through 24" diam pipes to chillers and other heat transfer equipment located on four floors of a six story building about 50' below the tower. The equipment must be kept in operation at all times. Any downtime for preventative maintenance must be minimized and has to be coordinated with user schedules.

Surrounding the complex is farmland on three sides and heavy construction on the other. The amount of airborne dust entering the tower varies with the crop season and wind conditions. Mud accumulation in the cooling tower sump and on the warm heat exchange surfaces will eventually lead to system failure if it is not removed.

Normal practice has been to schedule a shutdown over a weekend about once a year and clean out the cooling tower during the downtime. It takes a crew of 4 men about 6-8 hours to clean out the system.

Solution: ARCO learned of a continuous cooling tower water filtration system through an employee who used to install the equipment. They decided to purchase one of the permanent (sand) media filtration systems which they learned had reduced downtime, lowered energy and maintenance costs, and extended equipment life at a number of other cooling tower installations.

The 36" diam (7.1 sq ft area) sand filter was installed on a side stream of the plant condenser water, piped from the main pump's 24" discharge pipe with a 4" diam line which is connected to the top of the filter and out the bottom, discharging to the condenser water return header back to Sand filter at ARCO Oil and Gas Co. has eliminated the need for cleaning the cooling tower.
Contaminants in Your Cooling Tower Increase Your Operating Costs

Solid contaminants such as dirt, dust, sand, slime, and dead algae will reduce your cooling system's efficiency, and will increase your operating costs. Deposits of solids as thin as a human hair reduce heat transfer efficiency, thereby increasing energy costs. Further build-up of solids will cause increased head pressure, clog spray nozzles, and require more frequent need for maintenance shutdown.

Can you risk possible system shutdown during production hours? In businesses where production downtime is measured in minutes, preventing less than one hour of downtime can pay for a PEP Filtration System.

Your Cooling Tower is a natural air scrubber. In the scrubbing process airborne particles are pulled into the tower, an ideal environment for algae and bacteria growth. The cooling tower sump concentrates these pollutants causing a deposit buildup on your condenser and heat exchanger tubes and on other process or cooling equipment. The result is reduced efficiency, frequent downtime and costly cleanouts.