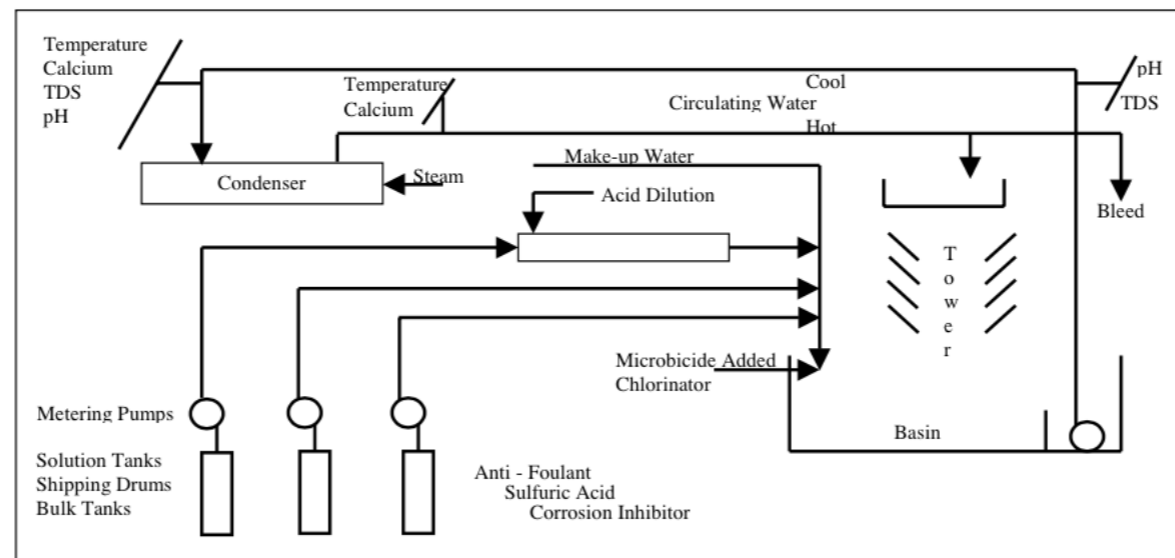


Honeywell

HC900 Cooling Tower Water

Industry: Utility

Application Brief



Problem

The primary function of a cooling tower is to cool water from the condenser by absorbing heat through evaporation. Water losses require the addition of make-up water based on a "Cycles of Concentration" calculation:

- $CC = \text{TDS in cooling water} / \text{TDS in make-up water}$

Or:

- $CC = \text{cooling water chlorides} / \text{Make-up water chlorides}$

Where:

CC = Cycles of Concentration

TDS = Total Dissolved Solids

The main concern in any cooling system is to maintain the integrity of the condenser. The cleaner the surfaces, the better the vacuum that can be obtained, improving turbine efficiency. Continuous evaporation of water causes concentration of dissolved and suspended solids to remain in the recovered cool water. Over a period of time, due to maximized solubility limits, deposits will begin and increase at a steady rate.

Corrosion and scaling, being the major deterrent to condenser cleanliness, dictate monitoring of many water quality parameters and implementing many levels of control to assure optimum water quality.

Corrosion and scaling potentials of the cooled water are measured and controlled based on the "Langlier Saturation Index" (LSI) calculated from pH, Total Dissolved Solids (conductivity), calcium, M – alkalinity, and temperature.

"Bleed Off" controlled based on variables such as Cycles of Concentration and Langlier Saturation Index varies the level of concentration in the cooling tower by replacing certain quantities of concentrated water with make-up water.

The HC900 Solution

In the past, cooling towers were controlled manually or with simple and limited automatic control. This was due to the large number of parameters and calculations needed for automation and the associated high costs for acquisition, installation, and maintenance of large control systems.

Today, rising energy costs and increased cycling/peaking operation are driving the need to implement life extension and unit performance improvement programs.

The HC900 Hybrid Controller has the capability to monitor all standard parameters such as pH, conductivity, calcium, alkalinity, and temperature. In addition, auxiliary parameters such as tank levels, hydrazine hardness, dissolved oxygen, and chloride concentration are easily handled.