"Repeatable analyzer results and Sample line piping"

Achieving Repeatable Results From On-Line Analyzers

The purpose of a Sample Conditioning and Analyzing System is to provide the operator with the information needed to prevent system corrosion and to insure clean steam. On-line analyzers should not only display significant upsets, but also show slowly occu rring trends. To accomplish the latter, the sample presented to the sensor must remain constant in flow and temperature. The role of the Sample Conditioning System is to maintain these "constant" conditions regardless of the operating mode of the plant, the season of the year, taking grab samples, or the maintenance or calibration of one or more analyzers.

To achieve constant flow through the analyzers, the input to the valved flowmeter supplying each analyzer must remain at a constant pressure. Next, the flow through the main pressure reducing device must remain constant. Finally, pressure must be contr olled with a back pressure valve to allow analyzer flows to be adjusted or grab samples to be taken without affecting other parallel flows.

The ideal constant sample temperature is 77°F (25°C), since at that temperature both conductivity and pH read true, regardless of the mix of chemicals in the water. Two stages of cooling are required to bring all of the samples to 77°F. The first stage sample coolers remove the bulk of the heat, while second stage coolers trim the temperature of all of the samples to the desired temperature. If the first stage subcools the samples (lowers the sample temperature below 77°F), then the trim stage must be capable of warming the samples to the desired temperature. Normally, a specialized chiller is used to provide 76°F cooling water to the trim coolers.

If only one stage of cooling is used, both the sample flow rate and the cooling water temperature must remain constant for a constant sample temperature to be maintained. This assumes, of course, that the pressure of the incoming sample remains constan t also. If these two conditions are maintained, the temperature of each sample will remain constant, even though the temperature of each sample will be different from the others.

Most sample systems use the plant closed loop cooling water to remove the heat from the coolers. Since the temperature of that water usually goes up and down with the season, a means must be provided to remove the temperature fluctuations if constant s ample temperature is to be achieved.

Every Employee an Owner,
Every Customer a Commitment

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