Table 1.8 Typical on-site monitoring and analytical checks for cooling water treatment

Parameter* (and normal units)	**Make-up water analysis frequency**	**Cooling water analysis frequency**
Calcium or total hardness (as mg/l $CaCO_3$)	Monthly	Monthly
Total alkalinity (as mg/l $CaCO_3$)	Quarterly	Monthly
Conductivity (µS/cm) or TDS (mg/l)	Monthly	Weekly
pH	Quarterly	Weekly
Inhibitor(s) level (mg/l)	N/A	Monthly
Oxidising biocide (mg/l)	N/A	Weekly
Microbial activity (cfu/ml)	Quarterly	Weekly
Legionella analysis	N/A	Quarterly
Total iron (mg/l Fe)	Quarterly	Monthly
Chloride (mg/l Cl)	Monthly	Monthly
Concentration factor (calculated value)	N/A	Monthly
Calcium balance (calculated value)	N/A	Monthly
*An explanation of the terms used in the 'parameter' column is provided in Info Box 1.6. These parameters are typically required to check that the correct level of each treatment chemical is applied and that adequate control is maintained over scaling, corrosion and microbial activity. They are not universally applicable and tests may be omitted or added to, as appropriate, for the specific cooling system, make-up and system water character and the water treatment techniques employed.		

1.120 Dip slides should be used to sample the system water downstream of the heat source. The water sample is usually taken from the return line to the tower. If a sample point is used, it is important to flush it to ensure a representative sample before the slide is dipped. The dip slide should be placed into its sterile container and into an incubator for a minimum of 48 hours, usually set at 30 °C. The incubation period and the temperature should be the same each time the test is performed.

1.121 Cooling system water should be tested weekly, using dip slides (or similar). The timing of dip slides and other microbial sampling is important. The sampling point should be remote from the biocide dosing point and for biocides, which are applied in a shot dose, sampling should be taken when the residual biocide is at its lowest and ideally performed at the same time each week. Table 1.9 lists guide values for the general microbial activity and the appropriate action to take.

1.122 While the number of microorganisms is itself important, it is also necessary to monitor any changes from week to week, particularly if there are any increases in the numbers of microorganisms detected. This should always result in a review of the system and the control strategies. A graphical representation of these data will often help to monitor any trends.