

Application of Streaming Current Technology in Water Treatment

The Streaming Current Meter provides a valuable tool for water treatment plant operators to optimize and control coagulant dosage. A major advantage of the SCM is that it provides information at the beginning of the process. This measurement allows operators to know precisely if the coagulant dosage is at the optimum point. Alarms and control systems can enhance the use of the SCM. It is important that the instrument be installed and operated properly to receive the maximum benefit.

The SCM is an online instrument that continuously samples the treated water just after coagulant is added. Chemical coagulants are added to surface water to destabilize the colloids and suspended material and promote flocculation. In raw untreated water, colloidal particles are stabilized with electrostatic forces. Oppositely charged chemicals reduce these repulsive forces to allow the particles to agglomerate or floc. The floc is then settled or filtered. The SCM measures how well the chemicals are doing their job by detecting the residual charge in the sample. The measurement indicates if the surface charges have been neutralized. So anything that will affect the charge balance will affect the SCM reading.

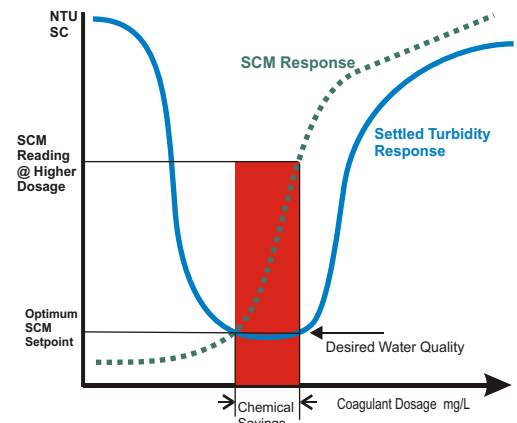
"The most important factor in plant performance is the use of optimal coagulant dosages in pretreatment processes. Without optimal coagulation, even the best rapid filtration facilities and the best filter operational procedures cannot ensure good filter performance", Journal AWWA, December 1993. Assessing Treatment Plant Performance, p.36.

The SCM responds to changes in raw water coagulant demand caused by turbidity, flow or other changing conditions. An automatic control system or an operator can make the necessary adjustments to maintain the optimum setpoint for the SCM. The setpoint is determined empirically or with the use of other instruments depending on the treatment goals. Typically, this optimum setpoint corresponds to the SCM reading where the minimum dosage is required for acceptable water quality. The reading can be adjusted to zero, which is a convenient reference with respect to the optimum condition. Alarm outputs of the SCM give provide an early warning system in case of chemical feed loss or other malfunction. This feature minimizes any potential plant upsets. Other benefits include chemical savings through minimizing any overfeed conditions and more consistent finished water quality.

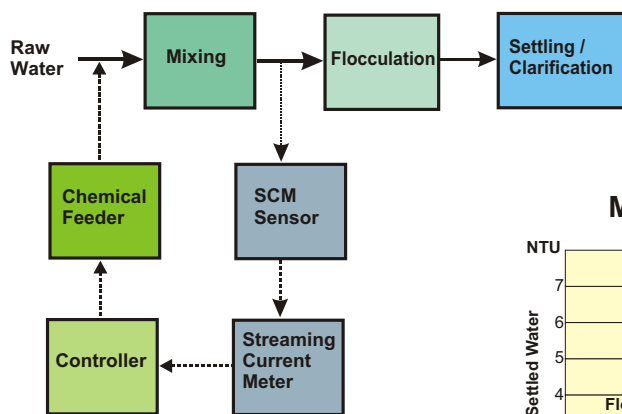
The SCM has proven it can help operators avoid plant upsets and minimize the threat of waterborne disease outbreaks associated with pathogens such as *Cryptosporidium* or *Giardia*. More recently, the SCM gives the plant an extra security measure by providing an early warning system in case of sabotage or terrorist activity. Treatment plants have seen chemical savings averaging 12 to 23% with the help of the SCM. Many plant operators have documented the merits of this technology over the years and confirm its value as a tool for water treatment.

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Streaming Current and Turbidity Relationship



Streaming Current Control System



Maintain Water Quality with SCM Control

