

RTC-ST REDUCES POLYMER AND INCREASES BIOGAS PRODUCTION

Introduction

Hach's off-the-shelf Real-Time Control System for Sludge Thickening (RTC-ST) adjusts the sludge thickening process in real time. Thanks to the RTC-ST, a wastewater treatment plant improved thickened sludge consistency and gas production while reducing money spent on excessive polymer dosing and maintenance.

Background

A Hach customer in the wastewater treatment industry has a plant capacity of approximately 76 MGD. The sludge from the primary sedimentation basins is consolidated in a sludge thickener and then undergoes mechanical sludge thickening before it is sent to the sludge digestion stage. Before the installation of the RTC-ST, polymer was added based on laboratory measurement values of the sludge concentrations taken every two hours. It was therefore impossible to adjust polymer concentration based on the current sludge concentration and composition, resulting in high polymer use, fluctuating and low solid concentrations in the thickened sludge, and low gas yield during digestion.

Objective

In order to reduce the use of polymer, increase the TSS concentration in the thickened sludge, and increase the gas yield, the operating company sought a polymer metering method dependent on the actual sludge load and sludge composition.

Figure 1 shows the loading volume (blue), the solid concentration in the influent (green) and in the thickened sludge (purple) along with the polymer volume (red) measured at a specific thickener in the initial situation.

With influent concentrations between 10 g/L and 30 g/L and manually set polymer volumes, the TS concentration varies in the thickened sludge between 38 g/L and 100 g/L. This leads to an excessive use of polymer and can cause

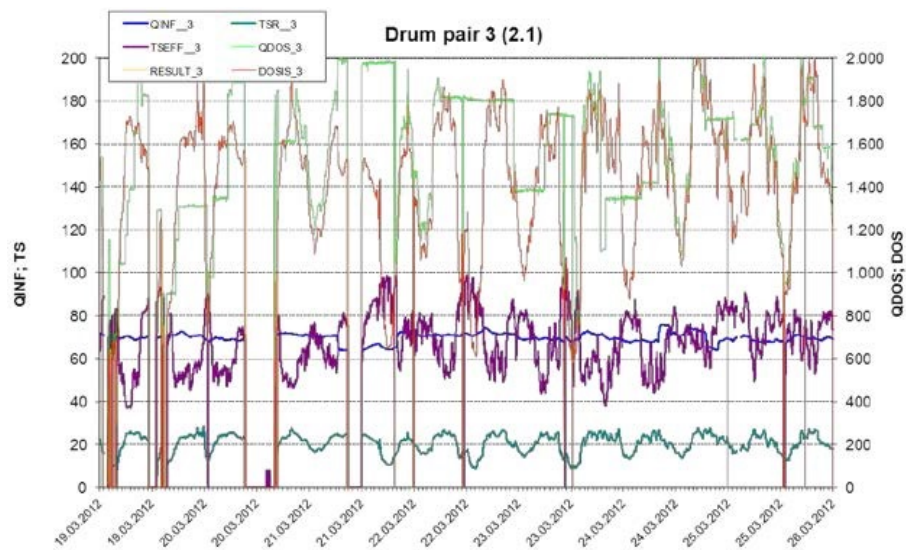


Figure 1: Operational results before the use of RTS-ST System



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further operational problems during sludge treatment.

Figure 2 shows the results achieved at the thickener. Based on the solid measurements and the RTC-ST system, polymer addition has been reduced; the required solid concentration in the thickened sludge (here 5.5%) can also be set.

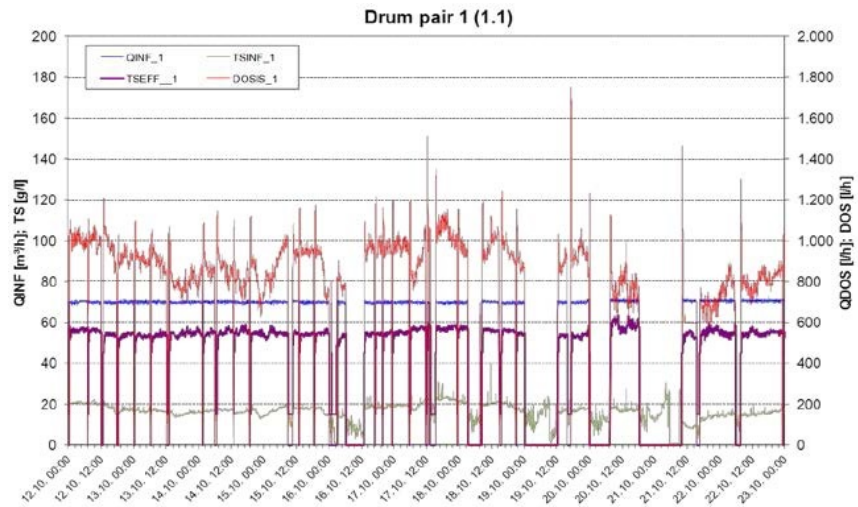


Figure 2: Operational results with use of the RTC-ST System

Solution

To measure the solids concentrations in the thickener’s influent and in the thickened sludge, SOLITAX solids probes with corresponding installation fittings were installed. Based on the load volume and the solid measurement in the influent, the RTC-ST system sets a specific polymer dosing rate (kg of polymer per t of solid).

Based on the measurement of solids concentration in the thickened sludge, the load-dependent metering volume is corrected in order to achieve the required target solids concentration value in the thickened sludge in the event of varying sludge properties. Through the installation of the RTC-S system, the sludge thickening process has been optimized considerably at this wastewater treatment plant.

Advantages include:

- Increase in the solid concentration in the thickened sludge from 4.5% to 5.5% on average
- Increase in biogas production by 6%
- Reduction in polymer use by 35%
- Reduction in the cleaning and maintenance work by avoiding overdosing polymer
- Easy integration into the existing plant control



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LIT2146 Rev1

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