



Practice report

Sludge Thickening
KA Freigericht (32,500 PE)



More Even Total Solids Mass Flows For The Digester

The initial situation

Introduction:

The requirements for operating wastewater treatment plants are becoming more and more complex. At the same time, many water companies cannot afford to fundamentally upgrade wastewater treatment plants, some of which are getting old. Under these framework conditions, using standardised open and closed loop control elements is often a cost-effective option that still brings about the intended solution.

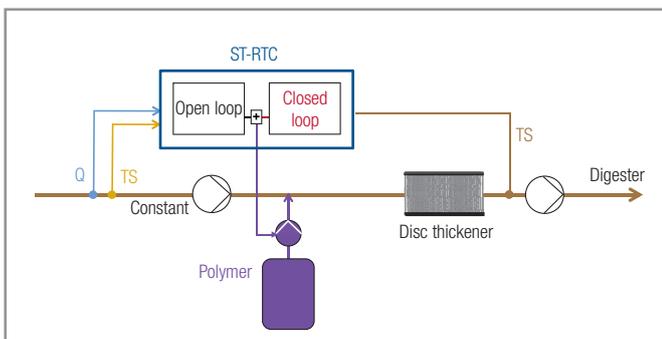
The wastewater treatment plant:

Mechanical sludge thickening at the Niedermittlau WWTP is carried out using a disc thickener and polymer addition. Previously, this component was controlled using flow measurement and total solids (TS) measurement upstream of the disc thickener.

However, this variant still left a number of shortcomings:

- ▶ Significant fluctuations in the TS mass flow in the influent to the digester
- ▶ High polymer consumption
- ▶ Only limited parameters could be configured for the open loop control components
- ▶ Target/actual values are significantly different in some cases

Schematic display of the RTC installation



Graphic 1: Simultaneous open loop control and closed loop control of the polymer addition. Optimum metering of the polymer is only possible by integrating the load volume Q and the TS measurements upstream and downstream of the mechanical sludge thickening process. That results in consistently high product quality at the discharge of the disc thickener.

The plant

- ▶ Capacity: approximately 32,500 PE
- ▶ Utilisation: approximately 40,000 PE
- ▶ Last modernised: 2005-2007
- ▶ 2 combination tanks (aeration tanks with internal final sedimentation), together 10,230 m³
- ▶ Nitrification & de-nitrification
- ▶ Anaerobic sludge stabilisation
- ▶ Sludge generation: 2,200 t/a
- ▶ Communal and commercial wastewater



The advantages

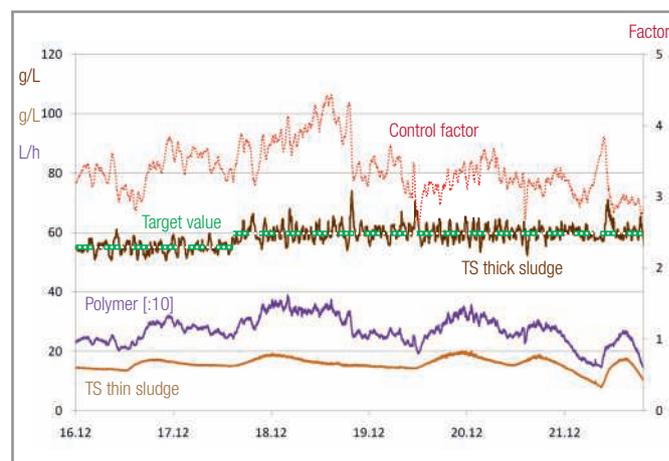
Retrofitting the HACH LANGE standard automation components for “mechanical sludge thickening” can achieve results including more stable TS concentrations in the influent to the anaerobic reactor. Together with load-dependent polymer addition, the combination of open loop control and closed loop control ensures greater process stability and a more even supply to the digester.

- ▶ More stable TS concentration in the influent for the anaerobic reactor
- ▶ Transparent TS contents during thickening
- ▶ Cost-effective solution without fundamental alterations to the system
- ▶ System operation that is easy to understand and menu-led



The measurement data

Consistently high product quality after thickening using TS load dependent polymer addition



Graphic 2: Load dependent polymer addition in practice. With a consistent load volume, the TS contents before the thickener (light brown) determine the polymer addition (purple). The success of this strategy is demonstrated by the clearly more consistent TS measurement after the thickening process (dark brown). The interventions by the downstream closed loop control are shown by the fluctuating control factor (red).

The solution

- ▶ Installing two SOLITAX highline sc solids probes in the influent and in the solids discharge of the disc thickener (pipe installation)
- ▶ Load dependent polymer metering via ST-RTC
- ▶ Simultaneous open loop control and closed loop control of the polymer addition



Author:
Frank Fischer
Niedermittlau wastewater treatment plant (ARA II)
Abwasserverband Freigericht

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