



# Technical Paper

## Wastewater systems

### Session 8-2

## Optimization of Sewage Pumping Station using System Approach

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## Summary

Sewage Pumping Stations of medium and large size cities often consist of one to more dry pumps driven by electrical motor, power supply via frequency converter, computerized control system and often equipped with pump diagnosis system.

Because of higher grade of automation as well as change of sewage itself operational problems due to clogging of sewage pump became major problems in some installations.

New approach for investigation of sewage pumping system is done by including all relevant elements in the experimental setup. The strong interaction between control system, fluid flow and operational behaviour results in special effects, which are detectable by overall system approach only.

TU Berlin Fluidsystemdynamics, Berliner Wasserbetriebe and KSB built up a complete sewage pumping station in scale 1:3 (Fig.1). All major parts like suction basin, pipes and elbows are made of synthetic glass which allows detailed investigation and documentation of clogging phenomena in different areas.

The presentation deals with new understanding of causality for different kind of clogging in a sewage pumping system. Typical clogging scenarios are simulated and clustered, always compared to practical experience in the field. Improvements of operational behaviour for sewage pumping turned out from understanding the reasons for clogging in different areas.



**Figure 1: Pumping Station test rig**