Aeration System Optimization at WWTP Bramsche

Workshop ATLANTIS, Cairo, 25th October 2021

Company

RMU is specialized in the biological processes and aeration technology for municipal and industrial wastewater treatment plants.

MESSNER® Aeration Panel

- Membrane types for different applications
- Mounted directly on the tank floor
- To be lifted out on a frame

MESSNER® ICS

- Interactive Control System for biologic stage of WWTP's
- Concepts, modular PLC-Blocks or PLC-Systems with touch panel

Complete Aeration Solutions for optimized biological treatment

WWTP Bramsche

MESSNER Aeration Panel Classic (2m²)

- **Base Plate:**
  completely consisting of acid-proof stainless steel (AISI 316) -> unlimited service life

- **Membrane:**
  long-term stable, permanently elastic membrane of TPU without plasticizers or other additives
  -> expectable service life up to 20 years

- **Perforation:**
  unique RMU perforation procedure to obtain optimal sized 2-3 mm bubbles
  -> highest oxygen transfer efficiency

- **Assembly:**
  fixed installation on the tank floor, thus maximum depth of entry and optimal oxygen utilization without sedimentation of activated sludge

MESSNER Aeration Panel Compact (1m²)

- **Base Plate:**
  completely consisting of acid-proof stainless steel (AISI 316) -> unlimited service life

- **Membrane:**
  long-term stable, permanently elastic membrane of TPU without plasticizers or other additives
  -> expectable service life up to 20 years

- **Perforation:**
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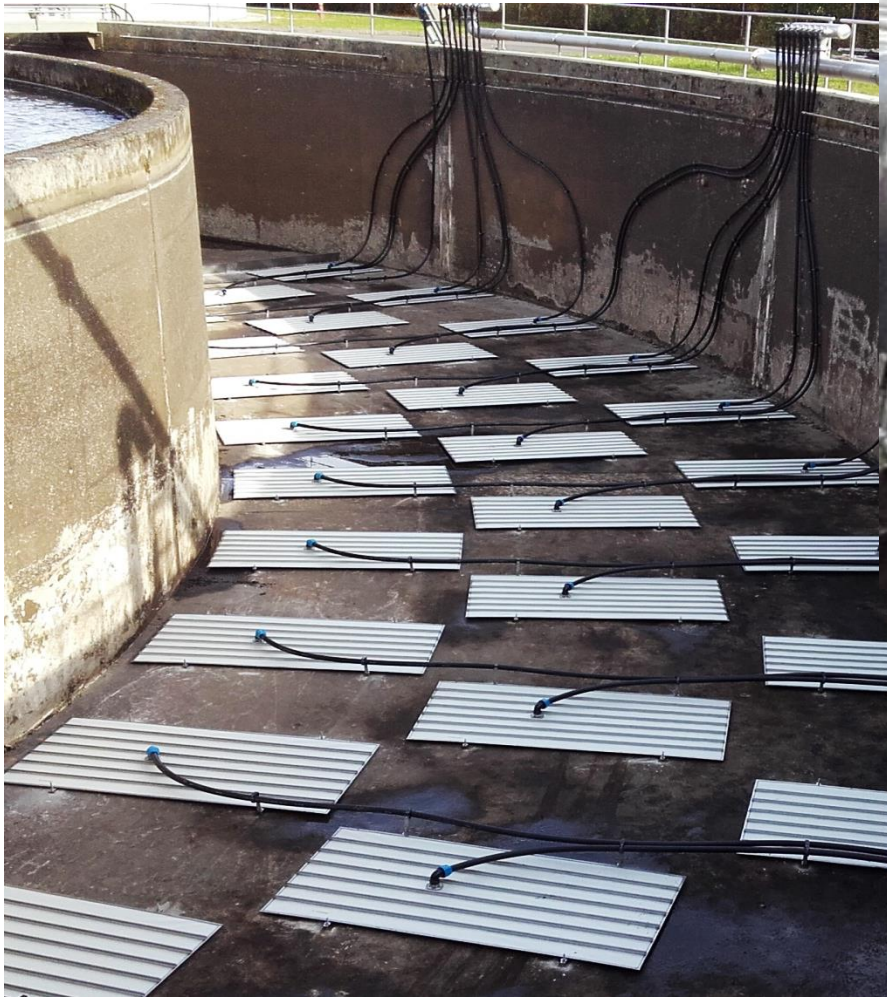
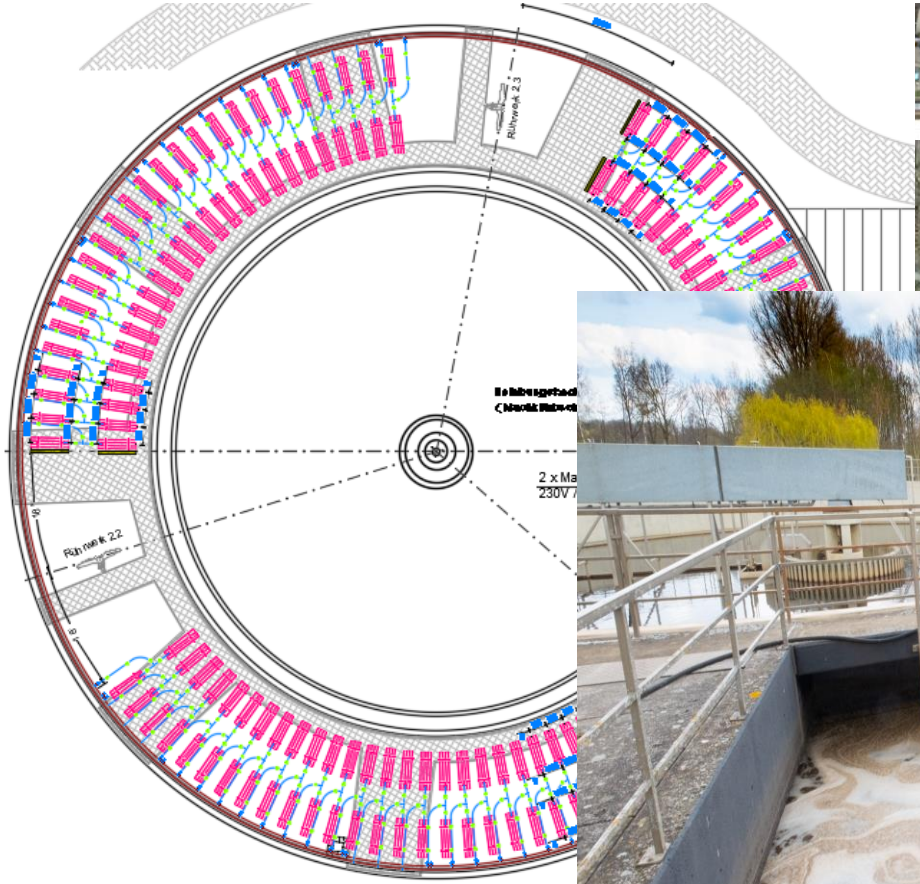
Installation of the MESSNER® Aeration Panel



Reference: WWTP Bramsche
Aeration System Optimization

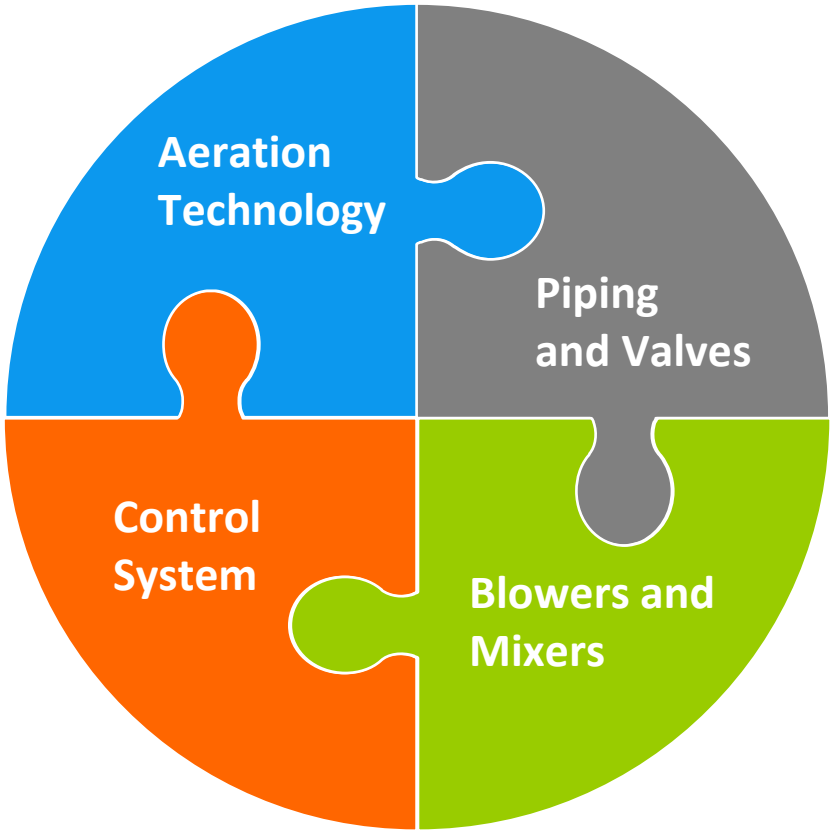


Initial Situation
Renewed Situation

- **Energy Savings > 50%**
- **CO2 Reduction 520 to/year**

Key Factors for Aeration System Optimization

1. Aeration Technology / Diffuser Type
2. Aeration Layout / Design
3. Blower Selection / Operation
4. Process Engineering / Control System



Matching selection of all components and flexible oxygen delivery to the current demand!

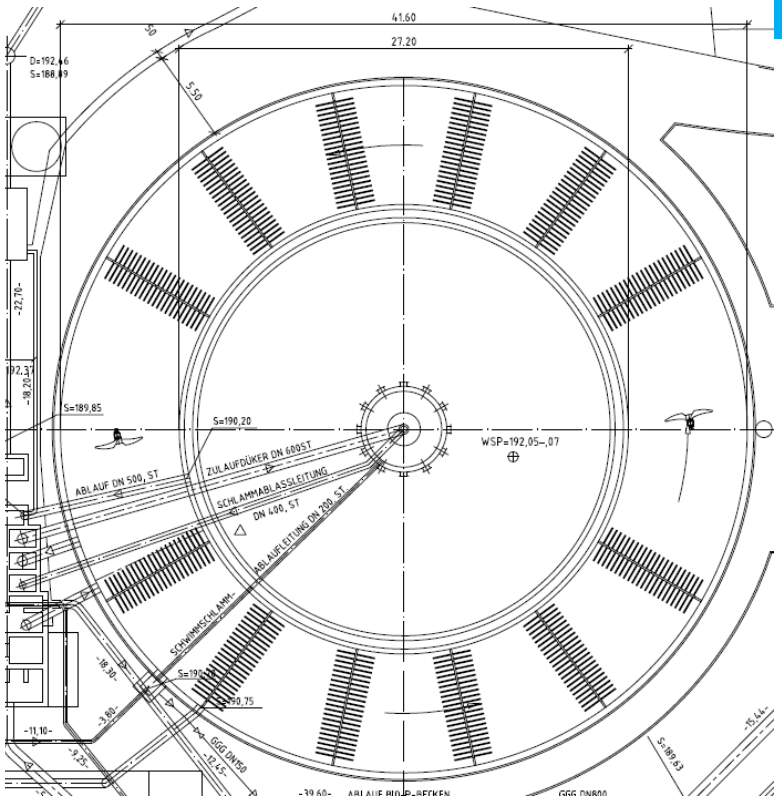
1 Efficiency vs. Aeration Technology

Surface Aeration

Diffused Air Aeration

Efficiency

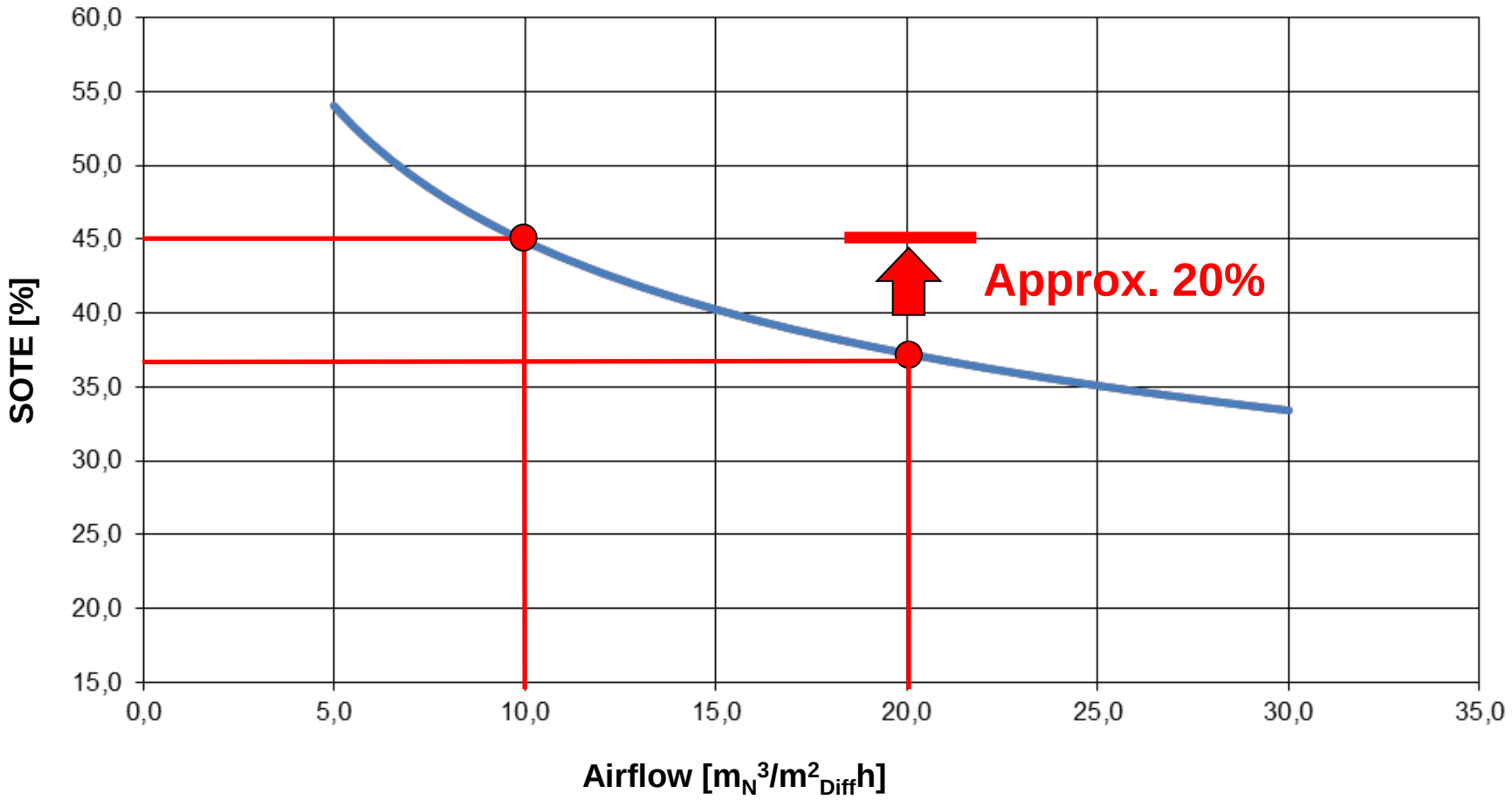
2 Aeration System: Optimized Layout



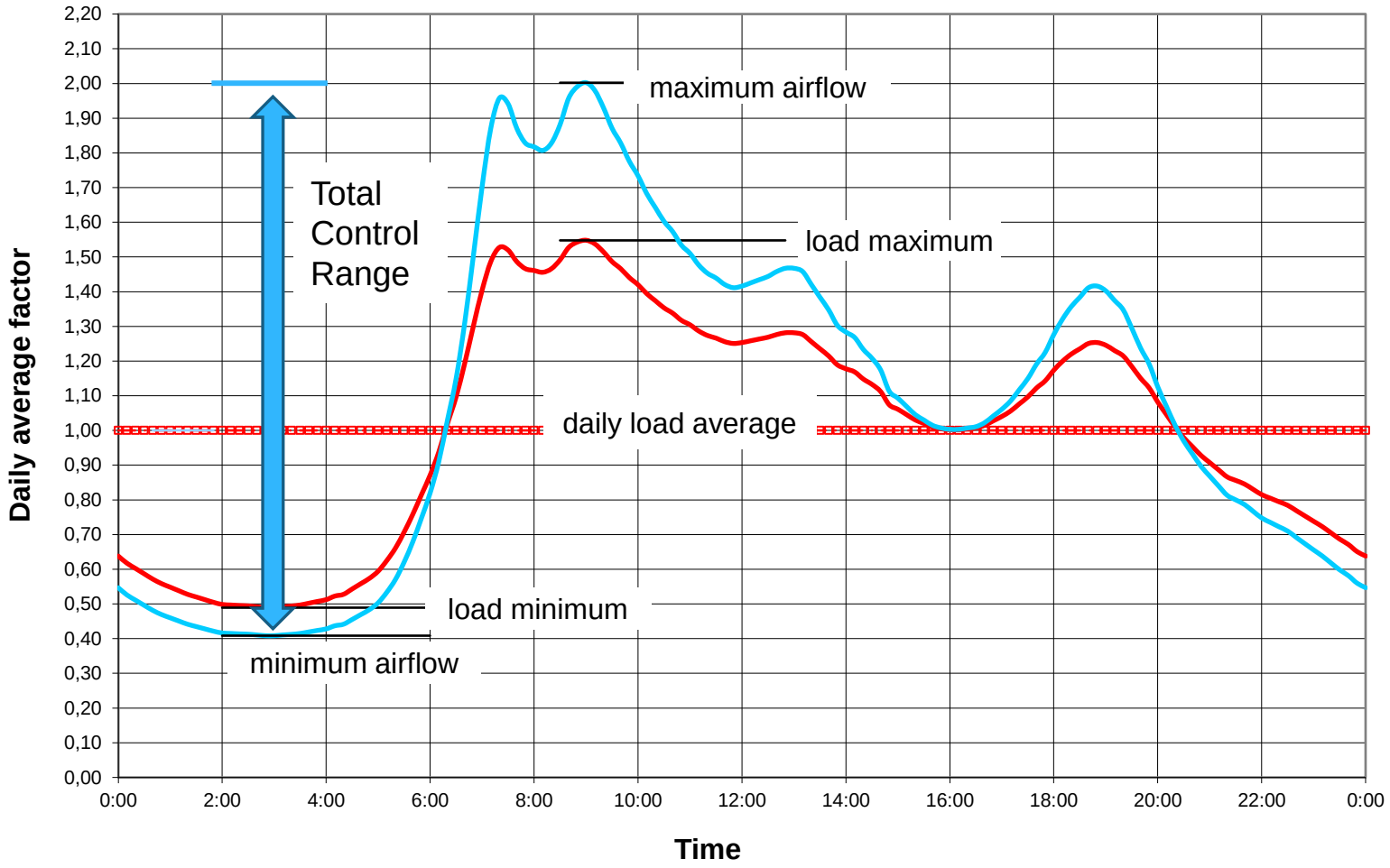
- High floor coverage
- Low airflow per sqm of membrane area
- High efficiency
- Low operating costs

- Low floor coverage, air rolls
- High airflow per sqm of membrane area
- Low efficiency
- High operating costs

2 Aeration System: Specific Airflow
Higher Efficiency by reduced Specific Airflow

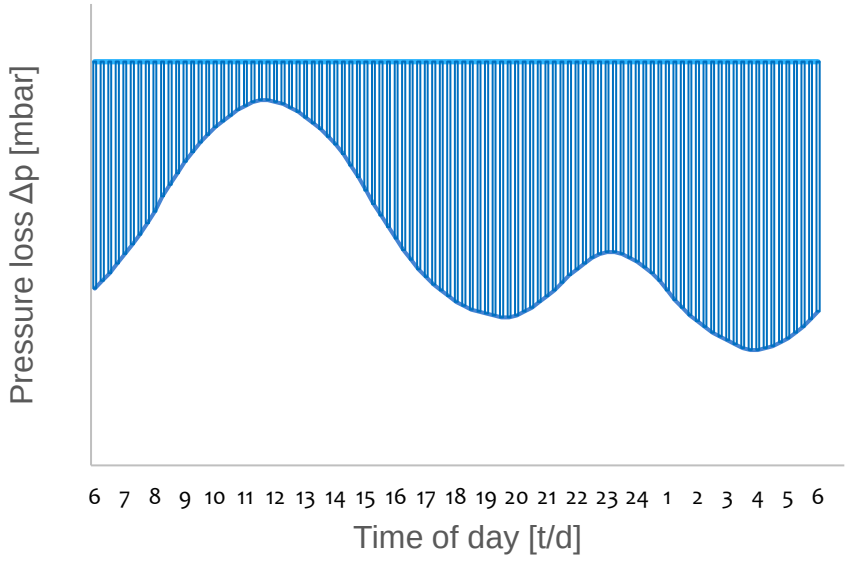


3 Blower Selection / Operation
Typical Daily Characteristic of Load and Airflow

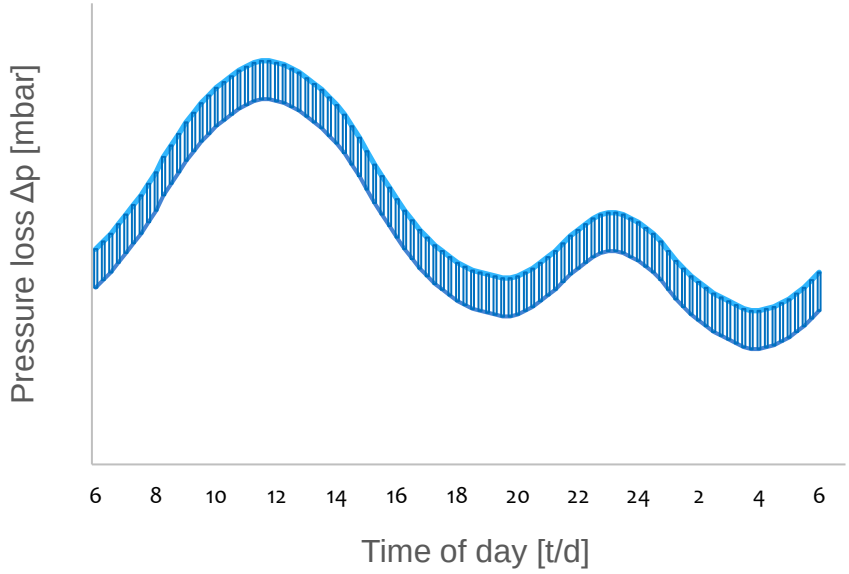


4 Control System
Constant vs. Sliding Pressure Control

Constant pressure control



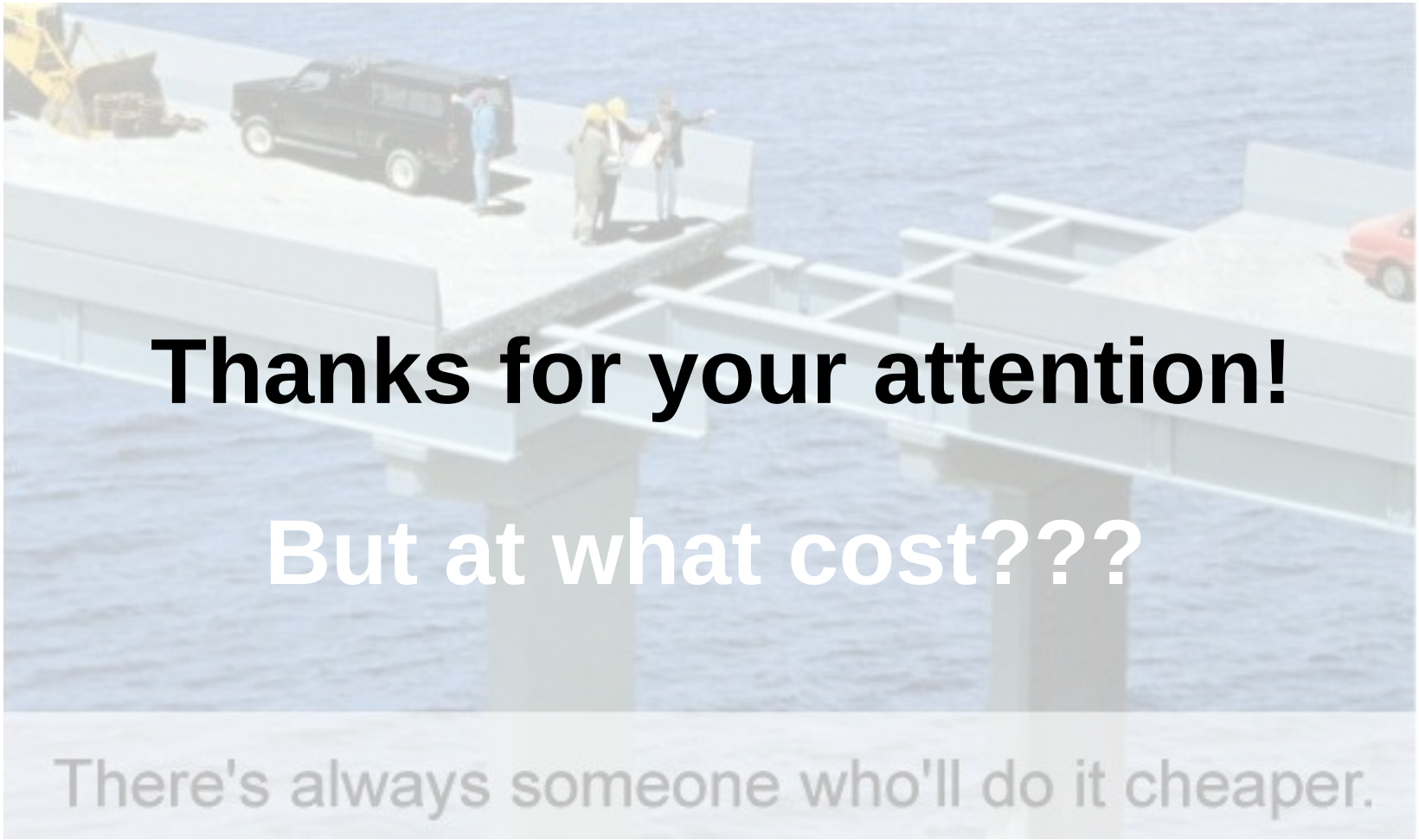
Sliding pressure control



Energy loss: $E_{loss} = \int [f_2(x) - f_1(x)] dx$

Member of
German Water
Partnership

RMU



Thanks for your attention!

But at what cost???