



DHI SOLUTION

# HYDRAULIC ANALYSIS OF INDUSTRIAL WATER SYSTEMS

## Ensuring optimal conditions

Safe, reliable, and sustainable water use is crucial. It also poses multiple challenges in industry. Site-specific measurements, telemetry data and output from numerical models all serve as typical sources for establishing water systems, developing safe and energy-efficient operating conditions and maintaining water quality standards. We cover all these aspects, making us your ideal partner for water supply, distribution, treatment and disposal as well as related services.

### HYDRAULIC MODELLING

We provide in-depth analyses and studies of the industrial water chain, its elements and their functionalities, including normal operation under controlled conditions and emergencies. The analyses are performed for the existing state of the systems as well as for planned system expansions.



Hydraulic modelling is used to support the design as well as to develop safe operating conditions. © DHI

Hydraulic models are often used to:

- validate the design of new or rehabilitated pipelines
- verify the system capacity
- analyse the effect of modified infrastructure within the context of the entire water distribution system or its subsystem

We provide hydraulic and water quality modelling services. These include:

- steady-state analysis
- unsteady flow analysis
- hydraulic transient analysis
- water quality analysis
- scenario development
- pressure optimisation
- existing and future demand scenarios
- optimum operation
- existing and emergency water supply

### SUMMARY

#### CLIENT

- Food and beverage industry
- Chemical industry
- Pharmaceutical industry
- Hospitals
- Consultants and contractors
- Technology providers
- Emergency response companies
- Factories

#### CHALLENGE

- Non-optimal network planning and operation
- Inefficient system performance
- Non-compliance with regulations
- High energy consumption
- Increased costs of water
- Need for water safety and security planning
- Unreliable production

#### SOLUTION

- Hydraulic and water quality modelling
- On-site monitoring and reporting
- Risk assessment and forecasting for network operations
- Emergency response systems
- Decision Support Systems

#### VALUE

- Ensures pipeline system operated safely
- Reduces risk of delayed or failed operations
- Enhances emergency response management
- Major cost savings and reduced downtime risk
- Cost-efficient design of water use systems
- Ensures compliance of risk levels with target values



*We analysed the industry pipeline system of a car manufacturing factory using our hydraulic transient program to establish safe operating conditions. Photo: iStockphoto © zhuzhu*

### DESIGNERS AND TECHNOLOGY PROVIDERS

This category comprises those entities which develop technologies to enable production industries (end users of technology) to:

- comply with more stringent regulations
- get value from water reuse, energy recovery and materials recovery

### FOOD AND BEVERAGE INDUSTRY

The food and beverage industry focuses on the health and safety of their products as well as on smart and green production to increase product efficiencies. We can assist you with solving the associated issues related to water management, including water availability, optimising water use and improving of wastewater treatment efficiency.



*We analysed a brewery pipeline system in order to determine the production capacity of the pipe network. © DHI*

### PHARMACEUTICAL INDUSTRY

We can improve the reliability of pure and safe water. In most cases, this will positively influence process efficiency and production costs. We have wide-ranging experience addressing the growing concerns related to restrictions on the discharging of certain chemicals into the environment.

Contact: [info@dhigroup.com](mailto:info@dhigroup.com)

For more information visit: [www.dhigroup.com](http://www.dhigroup.com)

### CHEMICAL INDUSTRY

We will help find solutions to a variety of typical issues like optimising water distribution networks, the availability of water for extinguishing fires, minimising water losses, optimising wastewater processes, and controlling the environmental impacts of wastewater discharges.

### MONITORING

Appropriate calibration data is a prerequisite for the application of models for analytical studies and on-line monitoring systems. The hydraulic model is typically calibrated and verified based on the flow and pressure measurement. At DHI, we can provide specialised monitoring services that address all these modelling needs. We can also conduct fire flow tests and unidirectional flushing to discover the bottlenecks in the existing systems and foresee problems that can emerge in crisis situations.

### REAL-TIME CONTROL AND ON-LINE MODELLING

All the mentioned issues can be controlled in real time. We can deliver comprehensive solutions for on-line control of water supply and distribution networks. Furthermore, we can develop advanced operational decision support systems (DSS) based on forecasts and automated simulations. The operational DSS supports system managers and operators in making well-informed decisions based on instant analysis of complex situations.



*At Odebrecht s.a., we provided on-site monitoring of and reporting on their industry pipeline systems. © DHI*

### REGULATORY RISK

Strict environmental regulations put high demands on industries to reduce waste emissions, substitute hazardous chemicals and invest in waste handling and treatment. Our on-line optimisation systems – based on hydraulic models of receiving waters – have solved serious issues related to such regulations.