

# Valmet's water and wastewater automation solutions

To improve the efficiency  
of the plant





### Automation offering

- Valmet DNA automation system
- Information management system
  - Environmental reporting
- Condition monitoring
- Valmet Total Solids Transmitter, Valmet TS
- Valmet Low Solids Measurement, Valmet LS
- Valmet Dry Solids Measurement, Valmet DS
- Valmet Sludge Dewatering Optimizer, Valmet SDO
- Shared Journey Forward, Valmet's way to serve
  - Reliability
  - Performance
  - New technology
- Industrial Internet
  - Remote support

## Innovative solutions for the water and wastewater plants

Valmet is a leading global developer and supplier of technologies, automation and services for many industries, including the water and wastewater segment. Valmet has more than 40 years of experience as automation system supplier. Water and wastewater is one of Valmet's emerging business areas.

Valmet covers with its offering clean water production, wastewater treatment in municipal plants as well as industrial applications.

Valmet's automation and measuring solutions portfolio includes decades of pioneering measurement solutions in a wide range of industries.

### Feeling the reliability

Reliability plays a central role in an automation system's life. Valmet DNA helps industrial and municipal plants maintain business continuity with proven lifecycle security.

### Automation solutions

Valmet's automation solutions are designed to maximize the profitability of our customers' businesses by improving their production performance and their cost, material and energy efficiency.



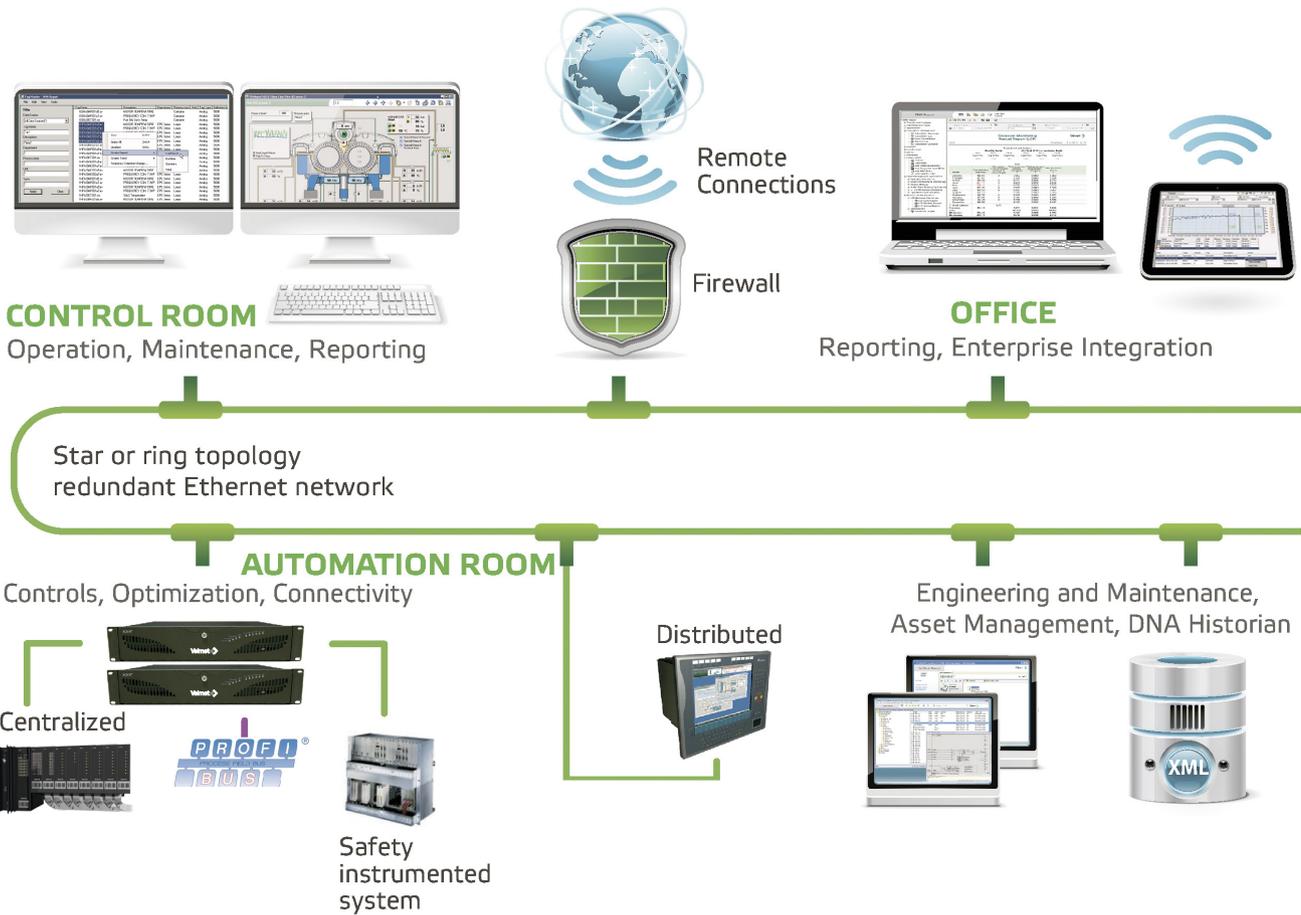
Designed to the highest industrial standards



Superior solutions for industrial and municipal plants



# Powerful architecture



# Thinking beyond technology

The Valmet DNA user interface is a live window into the process. It efficiently adapts to the user's work, enabling them to manage various process situations. Control work today does not only include normal process monitoring and predefined task execution, but also learning, communication, development and information gathering are new tasks for the operator.



A wireless Valmet DNA user interface is very useful in water treatment plants which often spread out over a large area.

## Operate, integrate, report

Valmet DNA is designed for all operator tasks. Obvious operations and clear pictures ensure that users have instantly accessible, accurate information about the task at hand. Trending, alarm analyzing, field device status and diagnostics, as well as reports, allow for users to act immediately in all situations.

## Intuitive and straightforward

The intuitive and straightforward Valmet DNA user interface enables quick problem solving and efficient decision-making.

Functions are especially designed with production professionals in mind. Process pictures designed for the tasks and role, give the user an intuitive view into process structure and situation. Graphical navigation, viewing history data from the very same process picture and information flow to the maintenance management system are user-praised examples of our straightforward approach in user interface.

## Feel the results

Despite being fact-based decision-making by nature, process control work includes lots of feelings connected with solving various situations.

The best results are achieved when operators feel competent to manage these situations, having the knowledge to make the right decisions, and the access to the right information and a connection to the right people, as well as when they feel able to develop both their working methods and themselves.

It's in our DNA.

# Network of experts

Getting data from the process is not enough – it also has to be distributed, shared and further processed in the mill's or plant's entire organization. This holds true, not just for the process data itself, but especially for the knowhow of the experts.

## Sharing the information

Modern communication technology and standardization have opened up new possibilities for transferring and displaying information wherever it may be needed.

A selection of tools supports the corporation-wide exchange of information and remote monitoring via mobile Internet. This ensures that your key experts can share the same event information at the floor level as well as in the head office. This way, all your teams can work towards common goals together, which leads to improved production and quality results. Business critical

information can be secured by classified user-rights.

The organization's memory – DNA Diary electronic diaries are used as discussion and information exchange tools for organizations. They have revolutionized the working habits in mills and plants while enabling fast communication and learning. The Web-based DNA Diary tool collects and stores work experience of the production community, which can be utilized for decision-making in similar situations in the future.

## Virtual expert teams

The development of tools for exchanging expertise and knowledge has brought new network-enabled cooperation forms, familiar from people's private computers, to plant floors. Today, an expert in a remote location, fed with real-time information from the target plant can collaborate and participate with his skills and experience in the decision-making process. Or when long distances and shift work become an obstacle for communication, a virtual expert team can be composed to solve an urgent problem.

## Reporting and analyzing tools

### DNA Report – basic system includes

- End user reporting environment with report development tools
- Tracer for trending and analyzing
- EEMUA 191 compliant Alarms and Events Analyzing tools
- Basic report set: log, summary, runtime and total reports
- End user Manual Data Entry tool
- Report scheduler for automated printing and e-mailing

### DNA Report – options

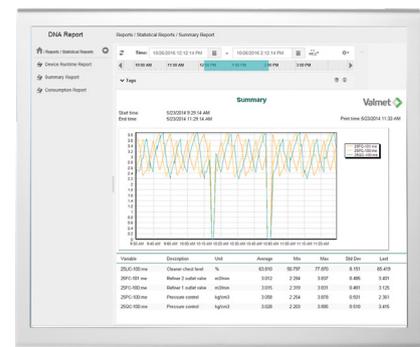
- DNA Report Disturbance Management
- DNA Report Sequence of Events
- DNA Report Excel Add-in
- DNA Report Diary – Operator Log Book

### Performance

- Concurrent users: No practical limits

### Hardware

- DNA Operate environment or office PCs



# Measurements for concrete savings



## Valmet Total Solids Measurement (0-40%)

Valmet Total Solids Measurement (Valmet TS) measures sludge feed and output cake solids for better process control.

Valmet TS helps maintain optimized solids in the sludge entering the digester, which helps save on running costs and improves intake digester capacity.

## Valmet TS benefits:

- Lowers the need for laboratory testing
- Lower transportation and incineration costs
- Reduces energy and polymer consumption
- Minimizes sludge accumulation
- Low maintenance requirements, with no moving parts

Delivered more than  
1,000 Valmet TS



## Valmet Low Solids Measurement (0-5000 mg/l)

Valmet Low Solids Measurement (Valmet LS) measures suspended solids in centrate liquid.

Until now, there has not been online measurement technology available that offers reliable measurements of material with minimal solids content.

## Valmet LS benefits:

- Accurate measurements easily available
- Self-cleaning and flushing for low maintenance optical LED measurement
- Helps to optimize polymer dosing and centrifuge torque
- Improves throughput of centrifuge
- Minimizes the amount of suspended solids that are recycled back into the plant



## Valmet Dry Solids Measurement (15-35%)

Valmet Dry Solids Measurement (Valmet DS) offers on-site sampling and analysis, with stable measurements. Unique to Valmet DS, the sample is extracted from falling cake flow, before it is returned to the process.

Accurate measurements are available real-time, to provide a solid foundation for controlling and developing the process, and improving efficiency.

## Valmet DS benefits:

- Reduces need for laboratory sampling
- Increases capacity
- Motor-controlled auger removes air issues in cake flow
- Savings in transportation and incineration costs
- Optimizes polymer dosage
- Energy savings through better torque control



## Valmet Sludge Dewatering Optimizer

Valmet Sludge Dewatering Optimizer (Valmet SDO) applies inputs from solids and centrifuge measurements to optimize the dewatering process.

Optimization takes shape from Valmet TS measurement of feed solids and dry cake percent solids and Valmet LS's centrate suspended solids measurements. With this data, Valmet SDO utilizes a multi-variable model predictive control (MPC) to control polymer dosing and centrifuge optimization.

## Valmet SDO benefits:

- Optimizes and automates centrifuge operation
- Savings through more efficient polymer usage
- Transportation and incineration cost savings
- Greater process sustainability
- Minimizes need for laboratory sampling
- 24/7 operation, no operator necessary

# Selected references

## World's largest membrane water reuse project

### Sulaibiya, Kuwait

Municipal effluent wastewater into high quality reclaimed water that will be used for agriculture. It is an alternate source of water for agriculture instead of using potable water needed for Kuwaiti residents.

The automation order was placed by Kharafi National, a contractor responsible for the engineering, procurement and construction, and Valmet's value added reseller (VAR) in Kuwait.

The plant will be started in 2017.

Advanced technology required: Valmet DNA automation system to cover the entire process

- Central control room in Sulaibiya
- Site in two locations: Sulaibiya and Ardiya
- Automation scope in total 2,600 I/Os

**Capacity change from  
375,000 m<sup>3</sup>/day to  
600,000 m<sup>3</sup>/day.**



## Water treatment plants in the capital

### City of Helsinki, Finland

Helsinki Water Works supplies the clean water to the capital. Two plants, Vanhakaupunki and Pitkäkoski are potable water treatment plants. The total capacity of these plants is 5,800 l/s.

Helsinki receives the raw water from the depths of the Lake Päijänne in Central Finland. The Päijänne tunnel is excavated deep in granite and gneiss to ensure the safe passage of the high-quality raw water. This is also the longest connected rock tunnel in the world which travels 30-100 meters below the ground.

Valmet DNA automation system in use in both plants

- Automation start-ups in 1994
- 75 million m<sup>3</sup> a year treated in total
- Activate carbon processes
- Automation scope 7,500 I/O in total

**"Efficient disturbance handling and process control reliability were taken into account."**

## Underground wastewater treatment plant

### City of Helsinki, Finland

Helsinki Water Works takes care of the wastewater treatment for the capital and many neighboring communities.

Viikinmäki Central wastewater treatment plant is constructed underground and has seven parallel lines. It is processing wastewater 100 million m<sup>3</sup> a year.

In addition to the process lines, facilities for pretreatment, sludge treatment, machinery and equipment have been excavated in rock. Most of the process facilities are above the sea level. The total space is 1,1 million m<sup>3</sup>.

Valmet DNA automation system in use since 1994

- Activated sludge process
- Automation scope 10,500 I/O
- 8 Valmet TS to help maintain optimized solids
- 2 Valmet LS for accurate measurements
- Valmet SDO to optimize and automate centrifuge operation

**"The main objective was to create an automation solution to control the plant 24 hours a day."**



Valmet's professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.



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