

# DIGITAL WAVE IN WATER TREATMENT

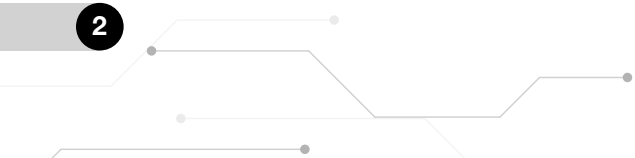


- Introduction to sustainability in the water industry
- Current drivers of the EMEA water industry
- Digital wave of innovation
- A successful journey to situational awareness
- Roadmap for the digitalisation of water treatment systems
- Digitalisation – an evolutionary process based on SMKLL
- Mitsubishi Electric's state-of-the-art solutions for the water industry



# **WATER IS THE DRIVING FORCE OF ALL NATURE**

*Leonardo da Vinci (1452–1519)*



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# INTRODUCTION TO SUSTAINABILITY IN THE WATER INDUSTRY

**“Water is the driving force of all nature” is a quotation from Leonardo da Vinci. Water is also a vital resource in the economic development, the agriculture, all sectors of industry and the sustainability of communities. We should therefore do everything possible to conserve our water resources. New technologies facilitate this.**

Ensuring the equitable access to water is one of the conditions for sustainable development. The Net Zero strategy implies that companies should aim to operate in such a way that they do not contribute to the increase in global warming.

To achieve this, it is necessary to act consistently in several fields:

- preventing climate change, which could result in the desertification of previously fertile land,
- reducing industrial pollution and keeping water consumption to the necessary minimum,
- protecting groundwater sources and open bodies of water,

- consciously and economically managing rainwater.

Linked to these issues is also the saving of electricity that is needed to power equipment in pumping stations and treatment plants.

In today’s world, these challenges should be an essential part of business strategy to align operations with the current legislation. Changes are necessary also because water is no longer understood to be an unlimited and cheap resource, equally available to all. We all need to control its use and to take full responsibility for water resources.

Automation and related technologies can provide invaluable support in processes aimed at conserving water

## IMPORTANT CORNERSTONES

**Saving and prudent management of natural resources are part of Mitsubishi Electric’s DNA. This stems from the Japanese experience of building society, culture and industry under conditions of limited access to natural resources. Sustainability initiatives, e.g. the protection of the environment, are extremely important to Mitsubishi Electric – not only as a corporate mission but also as a business model. We effectively combine social and economic values to the benefit of all involved.**

## REALISE SUSTAINABILITY

### SOCIAL VALUE

Impact on the environment and society

- Create positive impact (contributions)
- Reduce negative impact (responsibility)



- Create economic value from social value
- Create social value from economic value

### ECONOMIC VALUE

Earning power and other financial values

## DIGITAL TECHNOLOGIES WILL MAKE A SIGNIFICANT CONTRIBUTION TO WATER PROTECTION

resources. Overall, water supply networks, wastewater treatment plants and water management processes are increasingly large and complex undertakings. To be able to implement them in an ecologically sound way, it is necessary to have access to both high-quality data and advanced tools for real-time analysis.

As a global player in the field of automation technology, Mitsubishi Electric has a long track record of success in providing energy-efficient and sector-specific solutions for the water industry. To this end, Mitsubishi Electric has developed the Maisart brand of AI to support predictive maintenance, complex data analytics and process monitoring, thus making an important contribution to the company's ability to reach climate targets.

Factory automation is particularly effective in supporting and co-innovating with industry and infrastructure customers,

significantly helping to improve not only manufacturing tasks but also processes such as water treatment.



**Want more information about modern solutions that facilitate responsible water management?**

Watch "Digital Wave in Water Treatment" podcast with **Ms Alexandra Ervenich**, Director Water Industry FA EMEA.

# CURRENT DRIVERS OF THE EMEA WATER INDUSTRY

**Unrestricted access to fresh water is generally taken for granted – at least in Europe, where we are not used to water scarcity. However, the picture is deceptive. Climate change and urbanisation are putting enormous pressure on natural resources. Additional difficulties are related to socio-political as well as security issues.**

## TOP-RANKED ISSUES FACING THE WATER SECTOR

It must be acknowledged that water utilities around the world face similar challenges. American Water Works Association (AWWA)<sup>1</sup> identified the top 20 issues facing the water sector, ranging from ageing infrastructure, long-term drinking water availability over regulatory compliance and cyber security issues to labour shortages, energy-saving and cost recovery. This thought-provoking list is equally applicable to all other regions of the world.

This means that new and resilient solutions must be found, also on the European scale. It is certain that not all of the challenges mentioned by AWWA can be solved by state-of-the-art technology; some problems are simply of an organisational or political nature.

However, there is a great opportunity to respond to the challenges in water management with the effective use of intelligent technologies.

### **FACING RISING ENERGY COST**

**The continuous monitoring of electricity consumption and the efficiency of electric motors and other equipment makes it possible to identify and eliminate sources of loss. Mitsubishi Electric produces software and devices that enable the simple and effective collection and analysis of such data.**

<sup>1</sup> <https://www.awwa.org/Professional-Development/Utility-Managers/State-of-the-Water-Industry>.

## TRENDS CHANGING THE FACE OF THE WATER INDUSTRY

**Regulatory Compliance**  
**Non Revenue Water**  
**Safe Water Supply** **Urbanisation**  
**World Population** **Digitalisation**  
**Energy Efficiency** **Water 4.0**  
**Ageing Infrastructures** **Cyber Crime**  
**Service & Maintenance Cost**  
**Climate Change and Agriculture**  
**Skilled Labour Shortage** **Decarbonisation**  
**Ageing Workforce**

The water industry is going through a phase of fundamental change. This is primarily due to external factors, the effect of which water suppliers have to manage.

### AN INVALUABLE RESOURCE

Water is becoming so important not only because it is a vital resource and a basic prerequisite for all life on this earth, but because we increasingly feel that this resource is no longer available to us in unlimited quantities. Nowadays more and more conflicting interests appear between the supply of water to the population and the needs of industry.

**1.** Without efficient public water management there would be no residential or commercial areas, no industry, and no economic growth.

**2.** Critical issues include not only water scarcity, but also excessive rainfall/floods, and the contamination of water sources (sometimes all these simultaneously).

**3.** Acquiring drinking and process water, as well as pre-treating it and maintaining operating pressure in a distribution network, is energy-intensive – care should be taken to reduce these costs.

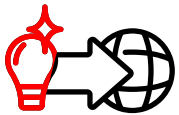
## AGEING INFRASTRUCTURE, LABOUR SHORTAGES

In many regions, the infrastructure used for water supply and wastewater treatment has been in operation for decades, with minimal investment in upgrading and expansion. Regardless of whether this situation affects local government institutions or private enterprises, the optimum solution is to gradually implement digital control of existing equipment and expand the system with modern components.

The key to success is software and devices that enable the implementation of modern control of both legacy- and up-to-date equipment.

The increasing average age of the workforce and the lack of experienced and educated engineers to replace retiring employees is also becoming a problem in the EMEA. This is where solutions using artificial intelligence and machine- and deep-learning come to the rescue. Expert systems built with their help are capable of partially absorbing the knowledge and experience of employees, and also support the training of new talents.

## WHAT DOES WATER MANAGEMENT NEED TODAY?



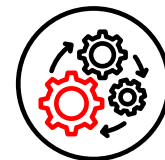
future-proof  
strategies



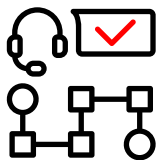
digital  
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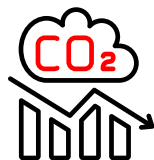
to become a data-  
driven industry



to optimise  
system operation



to streamline  
processes and  
customer services



to reduce energy  
consumption, CO<sub>2</sub>  
emissions and costs



integrative way to  
develop resilience  
strategies





## OPERATIONAL AND MAINTENANCE COST

Water treatment plants are under greater pressure than ever to ensure smooth operations and cost-effectiveness. These seemingly contradictory goals can be achieved by detecting the causes of losses and bottlenecks and optimising control.

Real-time data analysis and AI come to the rescue, supporting the process of anomaly detection. Rapid reaction to presage failures or situations potentially causing increased water and energy consumption helps prevent problems. A predictive model for servicing equipment extends its

service life and minimises the risk of unplanned downtime.

## PROVIDING A WIDE VARIETY OF INFORMATION

Water companies have to provide a lot of valuable information, not only about the level of water wastage but also about pathogens, microbes, and micropollutants. Using wastewater analysis to support early warning systems for infection and contamination has very high potential.

It is worth remembering that in 2021 the European Commission issued a recommendation to monitor



### CYBER SECURITY

the presence of the SARS-CoV-2 virus in municipal wastewater in cities with at least 150,000 inhabitants. In the future, similar recommendations may also apply to the presence of other viruses.

As a result, water companies need to provide and archive increasing amounts of information. It is impossible to manage this without the support of automation. To enable medium- and long-term statistical analyses, water companies should collect and conduct the real-time processing of large amounts of data. Technologies such as TSNs, edge processing and analysis using AI can help with this. These technologies are being continuously developed by Mitsubishi Electric.

Water management needs to be viewed in a more integrated way, so as to develop strategies for resilience to water supply interruptions, which are a major problem. For example, a lack of water in an industrial plant (e.g. a power plant) can bring production to a standstill and cause large losses; and an interruption in a wastewater treatment plant is a risk of contamination of rivers, reservoirs and other bodies of water.

Given that most water installations are being controlled by industrial automation systems and managed via computer networks, cyber security is crucial. It must be taken care of at all levels: from designing systems and software and managing software updates to responding to incidents and analysing attacks.

# DIGITAL WAVE OF INNOVATION

Modern water treatment plants have long been implementing a high degree of automation. The use of intelligent equipment such as solutions for pump optimisation, aeration control and smart sensors, and the practice of predictive maintenance has already increased. Nevertheless, the water industry needs to move to the next level of digital transformation to make itself future-proof.

Upgrading from a traditional water treatment plant to a digitally optimised one leads to much better operational efficiency, lower costs, better resource management, improved water quality and customer service, and a more sustainable and resilient treatment process overall.

Digitalisation is about improving processes by harnessing data and making data-driven decisions. The idea is to arrive at an integrated view of the complete

operational area, asset performance, customer contacts and work activities, thereby making the manual checking of multiple systems redundant. This is called 'situational awareness'.

## SITUATIONAL AWARENESS

This term means going from being reactive to being proactive and taking intelligent control – to create greater links between cause and effect (i.e. the relationship between weather and sewage alarms or the effect pump speed has on leaks).

### KEY AIMS ASSOCIATED WITH THE DEVELOPMENT OF SITUATIONAL AWARENESS



#### To prevent an issue

before it becomes an event. This mitigates risks dramatically.



#### To ensure the system's ability to link various sources of completely disparate data

to support the early identification and business responses.



#### To having a flexible system

sufficient to both develop and enhance in-house to meet future business needs.

### KEY AREAS FOR DIGITALISATION AND AUTOMATION

The automation of water supply systems or wastewater treatment plants is a necessity. Without it, it would be impossible to control systems in which reliability, safety and speed of response to failures and other emergencies are critical.

**The specific requirements in this industry are determined by:**

- the large number of devices that need to be controlled in real time,
- significant distances between these devices,
- the need to collect real-time information on physical parameters (e.g. pressure, flow rate, volume, temperature),

- the need to record the status of the system (opening or closing of valves, gates, starting and stopping of pumps, the filling level of storage tanks),
- the need to consider meteorological data, in particular current and expected rainfall,
- the need to ensure continuity of operation through the use of redundancy: multiplexed equipment, controllers, computers, reliable packet transmission in TSN networks,
- the need to prepare multi-variant analyses to anticipate the effects of changes, upgrades, network failures.





Scan the QR code  
and watch our podcast  
**'Digital Wave in Water Treatment'**.



**Mitsubishi Electric supplies its customers in the water management industry with:**

- reliable industrial automation equipment: controllers, industrial PCs, HMIs, sensors,
- energy-efficient, state-of-the-art inverters,
- hardware and software for building TSN networks,
- software for modelling and simulating processes using digital twin technology,
- software for managing complex industrial automation systems (ICONICS),
- solutions based on AI, such as MELSOFT MailLab.

Mitsubishi Electric also has very considerable and proven experience in implementing methodologies for starting and continuing the digitalisation process at a pace and scale tailored to the individual organisation's needs. We deploy our solution according to the Smart Manufacturing Kaizen Level (SMKL) philosophy.

## AI IN WATER INDUSTRY

**Artificial Intelligence can provide additional value without the need for water utilities to be familiar with this complex technology. Mitsubishi Electric has taken care of this by implementing AI at various levels:**

- **on the device level, to make Mitsubishi Electric's products smart and very efficient, to extend their lifetime and to deliver valuable process information;**
- **on the edge level for further data analysis.**

**As a result, artificial intelligence allows devices to self-diagnose, provide real-time diagnostics such as poor environmental conditions, detecting corrosion and faults, and improving energy efficiency – again without the customer needing to be familiar with AI or even data analysis.**

## REGULATORY PERFORMANCE BENEFITS

### ○ Improved customer service

### ○ Reduction in:

interruptions to supply  
number of properties affected by sewer flooding  
number of properties affected by low pressure  
pollution incidents  
leakages  
energy consumption

### ○ Improved asset condition

## COMMERCIAL BENEFITS

- **Prioritisation of tasks based on the financial implications for the company** – reduction of business costs (e.g. costs of work outside working hours/night calls, filtering alarms by priority and focusing first on those that are crucial, optimisation of planned work).
- **Increasing work efficiency** (more effective use of existing staff and knowledge transfer – compensation for shortages in the qualified labour force).
- **Anticipation and proactive response to weather conditions** so as to minimise impacts on business and customers (floods, weather including rainfall intensity).
- **Effective management of different locations/business units** (rationalising disparate data to reduce and shorten the decision-making process).
- **Extension of equipment life** with condition based maintenance.
- **Identification of energy reduction potentials.**
- **Management dashboards** (quality issues, KPIs, trends, water shortage, pipe bursts, etc.).

# A SUCCESSFUL JOURNEY TO SITUATIONAL AWARENESS

## A CASE STUDY OF SCOTTISH WATER

**Scottish Water, Scotland's public water supplier, is successively changing its operating model by using ICONICS Suite, the cutting-edge software from Mitsubishi Electric.**

This company began this particular journey about ten years ago, looking for a solution that could provide an integrated view of asset performance, customer contacts, and work activities. These activities concern their entire water network, with many different automation systems deployed and many different sources of data.

The search for an optimal solution was imperative due to the scale of Scottish Water's operations. Today the water and wastewater services



Reservoir at Edinburgh, Scotland

that the company delivers are vital on a daily basis to 2.62 million households and 159,219 business premises, which means it is important to the whole of Scotland.

Scottish Water's digitisation process has been smooth and has delivered tangible benefits at every stage. This is possible because, from the outset, all decisions are made based on accurate situational awareness. When planning the next steps in a process and evaluating their effectiveness, the Smart Manufacturing Kaizen Level (SMKL) method is helpful, as it is a reliable and highly effective way of proceeding that Mitsubishi Electric follows when implementing technological solutions.



ICC team members evaluating requirements

## THREE AIMS OF SCOTTISH WATER'S ICC

(Intelligent Control Centre)



**1.** Improve the speed of identifying various business risks (especially those which impact on customers!).

**2.** Build a flexible and future-proof system that could be further developed in-house to meet future business needs.

**3.** Have the capability to create business intelligence and link data sources (telemetry, SCADA, customer calls, GIS, weather and workflow systems).



## THE SOLUTIONS

Integrated met office view



Geo-spatial asset notification



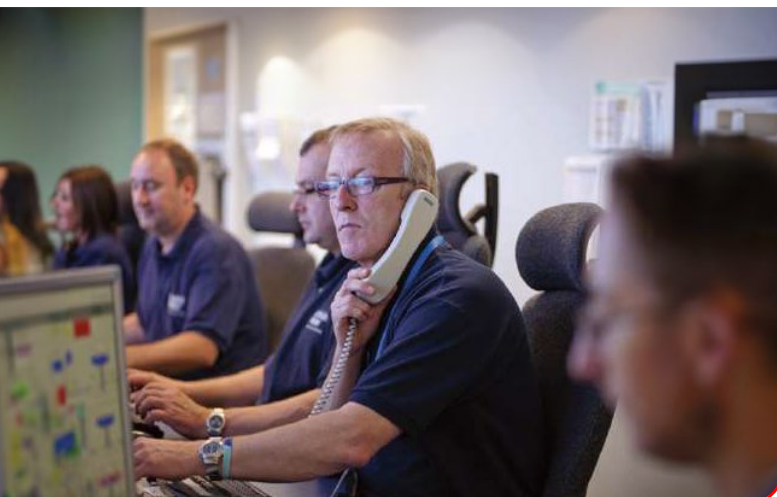
- » Real-time asset management dashboard(s).
- » Business rules and advanced alarm logic, applied across multiple data sources in real-time.
- » Open integration – utilisation of existing systems: GIS, Weather, Work Orders, Vehicle Tracking, Customer Calls, SCADA and Telemetry.
- » IoT-friendly and self-configurable solutions: Scottish Water have a solution that can be developed further in-house. They plan to plug extra data sources into this system in the future.



**This overarching situational awareness concept (utilising existing systems and not replacing them), which involves turning disparate sets of data into meaningful information, has allowed Scottish Water to respond more quickly and effectively to the needs of their customers.**

**It has also given them the ability to proactively respond to scenarios in which its assets or customers may have been detrimentally affected. And, finally, the financial savings are significant.**

**Scottish Water's path to digitalisation has been an evolutionary process. There are upcoming plans to integrate more telemetry systems and to add further intelligence to the system.**



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## THE BENEFITS

### » Improved speed of identifying business risks

between the 'event' and the customer has been established.

### » Improved response times

Scottish Water now can geographically position engineers into specific flooding hotspots based on live telemetry data, alarms and weather predictions.

### » Internal development:

We proved that you don't need to be an IT expert to build with ICONICS – said a manager of Scottish Water in 2015.

### » Complete view of their entire operation in real-time:

every data source is accessible from the control room, within a couple of clicks.

### » A future-proof system they can rely on!

# ROADMAP FOR THE DIGITALISATION OF WATER TREATMENT SYSTEMS

To create such a roadmap, it is necessary to have a plan, a strategy and, above all, a clear goal in mind. Even appropriate software and data collecting processes are not a guarantee of success. Successful digitalisation requires a solid foundation! A water company that uses data effectively has more control over its operations, leading to operational efficiency.

## 1 CLEARLY SET YOUR TARGETS

Find out which issues should be addressed and solved first.

Digitising a water distribution and treatment system can be costly and time-consuming. Most companies in this sector have limited budgets, so special attention needs to be paid to aspects such as feasibility, usability and financial control.

This is why it is important to start with prioritising things that need to be done first and working from there.

It is a good practice to prepare a detailed digitalisation plan that takes into account actual needs and future benefits. The basis is always to diagnose the existing situation, setting goals and defining optimal ways to achieve them. As elsewhere, in the water industry a tool for working through the digitalisation process is the Smart Manufacturing Kaizen Level (SMKL) method.

## 2

## COLLECT THE RELEVANT DATA

The data may come from very disparate sources or protocols. Mitsubishi Electric's software platforms are built around universal connectivity through open protocols. This kind of approach allows for data to be gathered from the relevant automation, IT and IIoT systems.

Nowadays we have a lot of data. The point is that we have to collect data that matters.

In this step, the water company should define the scope of the data needed and verify its availability. It should also verify that it has the tools for retrieving and transmitting data (sensors, interfaces built into equipment such as inverters, a TSN network etc.). It is also worth identifying company's data priorities and their impact on safety, production quality and process economics.

### 3

## ANALYSE DATA TO CREATE DIAGNOSTIC RULES; IMPLEMENT MACHINE LEARNING AND AI

The goal is to extract high-quality data that can be used to feed analytical software, digital twin simulation models or infrastructure management software. Once this has been achieved, it is the right time to prepare the necessary analytical tools. In the case of traditional statistical methods, we have to choose an appropriate mathematical model that is sufficiently compatible with the real system.

If a software incorporating AI is being used, the process of learning takes place in this phase. It is important to verify operational correctness and to check its level in terms of recognising anomalies and generating control signals or alarms.

### 4

## RUN ONLINE DIAGNOSIS OR DIAGNOSTIC SYSTEMS

The company already has the right tools in place for receiving the data provided online. Depending on the solutions adopted, these tools could be the control of equipment using edge-layer computing or the use of AI algorithms working directly on machine controllers and their HMIs. Predicting the effects of planned changes or modifications to the infrastructure without directly interfering with the actual system and incurring the associated risks can be supported by digital twin simulation models. Sufficient computing power and the parallel processing of the effects of several possible developments can be simulated in a short period of time. These processes are possible thanks to the digital twin solution deployed by Mitsubishi Electric.

### 5

## MAKE YOUR COMPANY TEAM TO BE ON BOARD

Digitalisation often involves a shift in mindset and skills. Training and open communication can help the transition run smoothly. The effective digitalisation of a company always involves a change in working practices. Employees need to change their habits, learn to trust expert systems, and recognise the limits of their applicability. This requires not only training users in the new tools, but also supporting them in gaining experience, e.g. in developing intuition, being able to assimilate the criteria for evaluating the effectiveness of the tools etc. Employees at all levels should become familiar with the new tools and learn how to use them. In this process, it is very important to have the support of experts who can clarify, on an ongoing basis, any doubts that arise.



# DIGITALISATION – PROCESS BASED ON SMKL

New technologies have the potential to deliver significant outcomes in the water sector. The capabilities of technology are progressing, not least when it comes to collecting information from disparate remote sources. Water companies can now gather and correlate such information across diverse systems and achieve situational awareness in near-real time. In addition to this it is now possible AI to interpret information coming from an array of structured, and increasingly unstructured, textual sources and data sensors.



more frequent and/or broader cyber risks as a serious threat. Statistics from the United Kingdom<sup>2</sup> show that around 45% of manufacturers do not invest in digitalisation because of concerns about cyber security. The research also uncovers the key obstacles to improving cyber security in this sector. Respondents identify the following: maintaining legacy IT (45%), lack

However, many companies face a number of challenges during the digitalisation process.

## CYBER SECURITY

In the PwC report “Managing business risks”<sup>1</sup>, this issue tops the list, with 40% citing

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<sup>1</sup> <https://www.pwc.com/us/en/library/pulse-survey/managing-business-risks.html>.

<sup>2</sup> <https://www.makeuk.org/-/media/eef/files/reports/industry-reports/make-uk-blackberry-cyber-security-report.pdf>.

## COMMON REASONS FOR LOW IMPLEMENTATION OF DIGITALISATION



### shortage of skills

(the ability to plan and manage digital transformation, develop solutions etc.)



### structural issues,

lack of accurate tools for digital maturity assessment



### limited awareness

about and risk aversion towards the implementation of new technologies

Source: <https://european-digital-innovation-hubs.ec.europa.eu>

of cyber skills within the company (38%) and providing access to third parties for monitoring/maintenance (33%). Mitsubishi Electric has developed many tools for dealing with these threats.

## IS IT NECESSARY TO REPLACE AN ENTIRE INFRASTRUCTURE?

The water industry may delay the introduction of digitalisation because of their belief that their infrastructure is outdated and needs to be replaced. These concerns are exaggerated. Digitalisation can proceed in stages, based on the resources available. Mitsubishi Electric's operating philosophy is based on integrating existing systems and new automation components as much as possible. This is important for companies in the water industry, where projects are rarely built from scratch.

It is much more common and cost-effective for technological changes and innovations to be implemented based on existing infrastructure.

**Mitsubishi Electric's role is to identify actual needs and provide the appropriate equipment and software for water management systems.**

## THE HIDDEN ADVANTAGES OF DIGITALISATION

Though most of the industrial companies confirm the importance of digitalisation/Industry 4.0, only a minority has already implemented a digitalisation strategy. What are the reasons for this? One answer is that many firms still do not know exactly what the benefits of digitalisation are, how it can contribute to making the industry future-proof, and, more basically, where to start.



Data-collecting is not a new process. It has been around for many years – the difference now is that we have more advanced technologies at our disposal. The key here is data science. Using statistical methods and AI to collect that data, contextualise it, analyse it and provide information back to an operation, which can then be used to make data-based decisions about the process. This is the fundamental change that leads to digital transformation.

At the same time, the risks associated with the lack of innovation are high. They range from biological and cyber vulnerability, technical obsolescence, inefficiency and waste of resources up to the inability to meet demand. The solutions provided by Mitsubishi Electric are making water companies more resilient to these problems.

**SMKL allows for the analysis of the current state of the company, the identification of its issues, and the planning and implementation of improvements. Smart Manufacturing Kaizen Level, based as it is on data, enables improvements to be made at various levels of the organisation and supports management in making the right business decisions.**

### SMKL – A RELIABLE EVALUATION

Two important questions arise from all this: how, specifically, can Mitsubishi Electric contribute to a successful digital upgrade of processes such as water treatment? How can it help those that are looking to initiate this transformation?

One of the advantages of Mitsubishi Electric is that it understands what needs to be done at two levels: the plant and OT level, and the enterprise level. In the first field, Mitsubishi Electric brings automation platform technology to perfection.

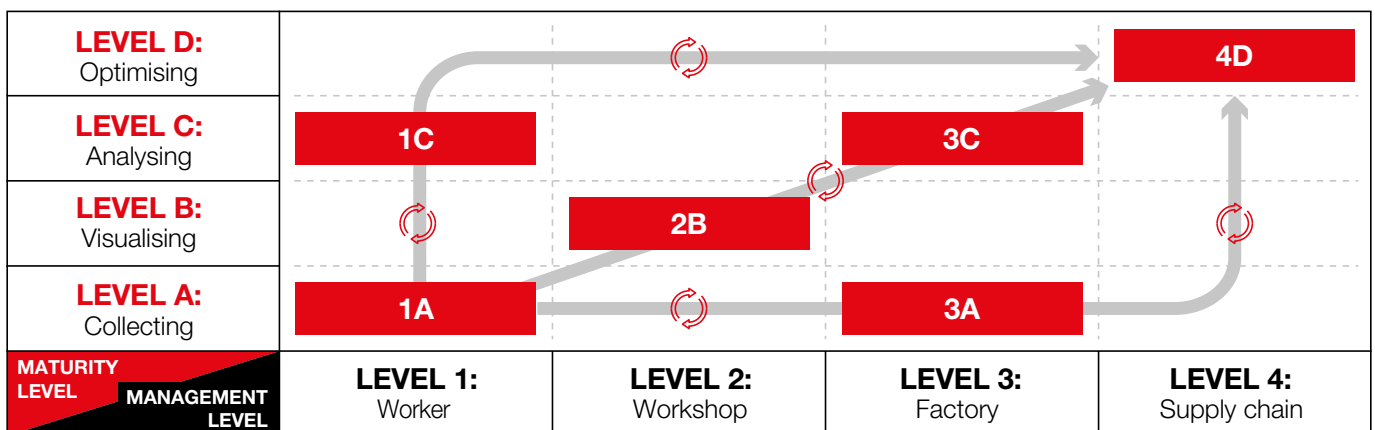
This platform is the basis of every process – whether it is a production task or a process such as water treatment. At this level a company typically collects data. Mitsubishi Electric also knows the enterprise level very well and how to use that data. This is why, as a company, it has developed Maisart®, Mitsubishi Electric’s own proprietary AI technology. Together with a strong focus on cyber security, universal connectivity and the integration of existing equipment, successful digital transformation models can be built. The company has also created MELSOFT MaiLab, a very useful tool based on AI. But the most valuable contribution Mitsubishi Electric can make to supporting its customers in their digital journey is related to the company’s Japanese origins.

Smart Manufacturing Kaizen Level (SMKL) is the method. KAIZEN in Japanese means ‘change for the better’ – this perfectly reflects Mitsubishi Electric’s philosophy and has become a company-wide slogan. As a part of our Japanese cultural DNA, this is still valid and applicable today.

SMKL allows for the analysis of the current state of the company, the identification of its issues, and the planning and implementation of improvements. Smart Manufacturing Kaizen Level, based as it is on data, enables improvements to be made at various levels of the organisation and supports management in making the right business decisions. Instead of tackling a huge challenge as a whole, it can be broken down to small steps that are incrementally addressed and optimised.

This is a perfect solution for the water industry too, as it provides the capacity for an appropriate digital transformation that fits business requirements and opportunities and guides utilities through this whole process – step-by-step.

SMKL is a framework driven by data that understands what is happening in a company’s process, identifies issues, helps to improve them and supports companies in making the right decisions and maximising profitability.



# MITSUBISHI ELECTRIC'S STATE-OF-THE-ART SOLUTIONS FOR THE WATER INDUSTRY

**Water is one of the most valuable natural resources, so every effort should be made to manage it properly. A large part of the responsibility for this situation lies with water and sewage companies, as they operate water intake and treatment systems and sewage treatment plants. Modern solutions that can support the management of those are necessary to improve the effectiveness.**

The Internet of Things (IoT) technologies like data analytics, cloud computing and AI provide new capabilities for analysis and automation, and the real-time correction, prediction and minimisation of risks. They have the power to help water and wastewater utilities address many of the challenges they face.

**These technologies bring the following benefits:**

- extend the life of ageing assets,
- reduce leakages, hacker attacks and other abnormalities in the distribution network,
- improve quality of water-monitoring, service levels and the reliability of supply,
- increase revenue through the improvement of operational efficiency,
- promote water conservation.

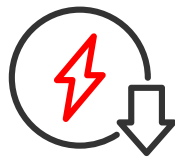
Existing and planned installations vary significantly in terms of their degree of technological advancement, their equipment, their machinery and their efficiency. Therefore, improving water

management must begin with creating a coherent, efficient and safe system. This system should be implemented gradually and include both existing and new solutions; it must also be scalable, secure and reliable. The primary goal is to achieve the ability to solve the problems from the very beginning, at the stage of implementation and the activation of the first facilities to be used.





**BUILD COMPETITIVE ADVANTAGE  
WITH MITSUBISHI ELECTRIC'S SOLUTIONS**



**the reduction of energy consumption**



**the monitoring the level of water quality**



**the reduction of emissions of carbon dioxide and other greenhouse gases**



**the increasing the efficiency of water and wastewater treatment**

Mitsubishi Electric has decades of experience in planning and implementing such solutions. We use the proven Smart Manufacturing Kaizen Level (SMKL) methodology to help set realistic goals and achieve measurable benefits in the very first phases of implementation.

Mitsubishi Electric has developed modern SCADA tools (ICONICS) for managing large installations. They are tailored for the individual needs of our customers.

Water industry companies have MELSOFT MaiLab at their disposal – an innovative tool with exceptional features. MELSOFT MaiLab is an analytical package that does not require

implementation or management by data science specialists. This translates into financial savings for firms by not having to hire highly qualified specialists. MELSOFT MaiLab users can adjust decisions made by AI to improve the quality of subsequent analysis. This tool continually keeps pace with the development of the enterprise.

The above-mentioned tools, together with a full range of automation components and Time Sensitive Network (TSN) technology, constitute a complete package of solutions tailored to individual customers in the water industry.

Together we protect water – the treasure of our planet – for the benefit of future generations.

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