The bridge to possible

Cisco and Rockwell Automation Save Water Worldwide with Digital Water Solutions

Water conservation is critical to sustainability. A solution that reduces leaks can increase output from existing water system infrastructure—and reduce the energy use associated with treating and pumping water.

Overview

Globally, organizations are investing in water and wastewater solutions. In 2022, the U.S. EPA announced US$7.4 billion in water infrastructure funding tied to the Infrastructure and Investment Jobs Act[1]. In 2020, the European Investment Bank (EIB) lent €4 billion to water-related projects in EMEA[2]. The Asian Infrastructure Investment Bank (AIIB) estimates that addressing water supply and sanitation across the region will require from US$90 to $150 billion per year[3].

Statistics from UN articles and documents[4] help tell the story:

- 2.1 billion people globally don't have access to clean drinking water.
- 4.5 billion people around the world lack adequate sanitation.
- Insufficient supply, poor sanitation, and water insecurity cost more than US$250 billion per year worldwide.

In response to this giant-size problem, Cisco and Rockwell Automation are working to create innovative water and wastewater solutions. These two industry leaders are driving digital transformation for smart water through industry-ready, world-class controls; power and information systems; and IT networking and security technologies.

[1] EPA Announces Water Infrastructure Funding for States Through the Bipartisan Infrastructure Law, Calls for Prioritizing Underserved Communities - December 2, 2021
[2] "There's plenty of water in the universe without life, but nowhere is there life without water" - 2021
[3] Asian Infrastructure Investment Bank (AIIB) Water Sector Strategy – May 2020
[4] Water Infrastructure and Investment

This solution overview discusses Cisco and Rockwell Automation Digital Water Solutions, a cloud-based platform. (See Figure 1 for a high-level view.)

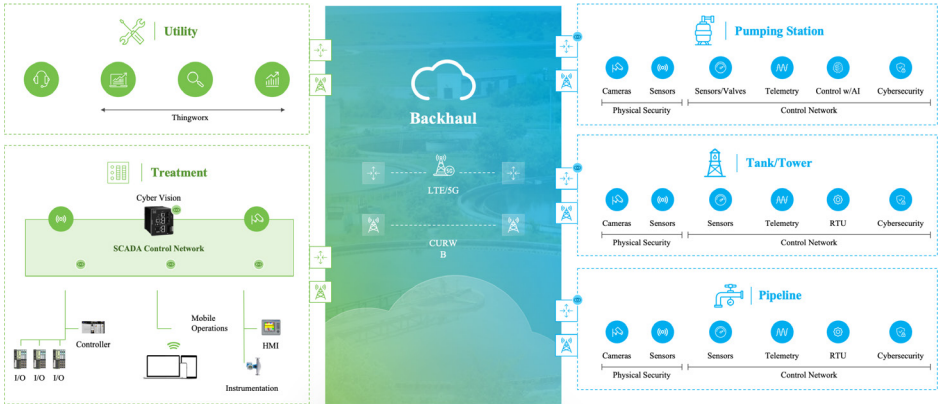

Figure 1 Cisco and Rockwell Automation Digital Water Solutions high-level architecture

Benefits

- Reduce energy consumption and costs with smart reservoir management and setpoints, while also managing process risk.
- Forecast and optimize energy consumption through predictive models.
- Control power surges that cause aging of equipment and materials.
- Reduce equipment breakdowns and costs by managing water pressure during distribution.
- Proactively prevent loss and significantly decrease mean time to resolution (MTTR) of corrective actions that require physical interaction.

Challenges

Utilities, municipalities, and industrial users confront significant challenges.

In an average-size* U.S. water processing system, (which services 80,000 people):

- Average water loss is nearly 5 billion gallons/year.
- Average energy loss is 15 million kWh/year.
- Average CO_2 loss is 11,850 metric ton/year.

* According to the EPA, the average-size U.S. water processing system processes 30 billion gallons and consumes 100 million kWh in energy per year to treat water.

The average cost associated with these losses is US$1.5 million annually.

Globally:

- More than 700 water lines break every day in the U.S.
- Almost 2 trillion gallons of water–15 percent of treated drinking water–are lost annually to leakage in North America.
- US$12 billion of water per year disappears through leakage in Asia Pacific.
- Eighty percent of Asia Pacific's wastewater is discharged into untreated bodies of water.

* The statistics cited in the first and second bullets are from the U.S. EPA. The statistics cited in the third and fourth bullets are from a study published by AIIB.

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How Cisco and Rockwell Automation solution works

By leveraging edge sensing, wireless connectivity, and sensor technology as well as data analytics and machine learning, Cisco and Rockwell Digital Water Solutions proactively addresses water loss and significantly decreases the time required to repair conditions such as broken pipes. Its architecture is comprised of three solutions:

Pressure management in water distribution

This solution predicts and manages pressure fluctuations (water hammer) caused by weather, seasonal variations, and demand for water. It optimizes water pressure to increase energy savings, reducing equipment breakdowns, and unexpected expenditures. (See Figure 2.)

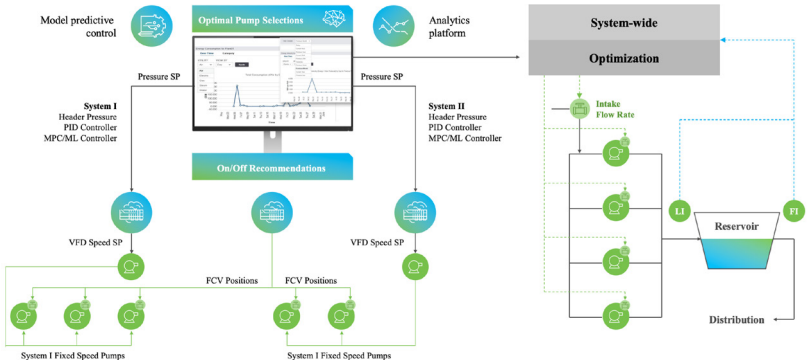

Figure 2 Pressure management in water distribution

Energy Consumption, Prediction, and Process Optimization

This solution deploys predictive models based on an advanced machine learning algorithm. This algorithm predicts setpoints, process values, and the power consumption of blowers and pumps. These capabilities result in lower energy consumption and costs, reduced equipment and material aging, and better-managed process risk. (See Figure 3.)

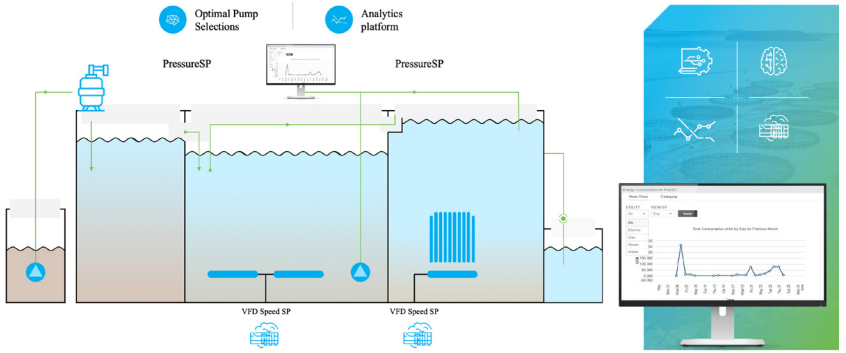

Figure 3 Energy consumption, prediction, and process optimization

Smart Water Reservoir Management

Designed to save energy, optimize water production, and help ensure supply, smart water reservoir management monitors and changes reservoir setpoints—adjustable parameters that control system operations—based on weather predictions, energy costs, demand predictions, and equipment status. (See Figure 4.)

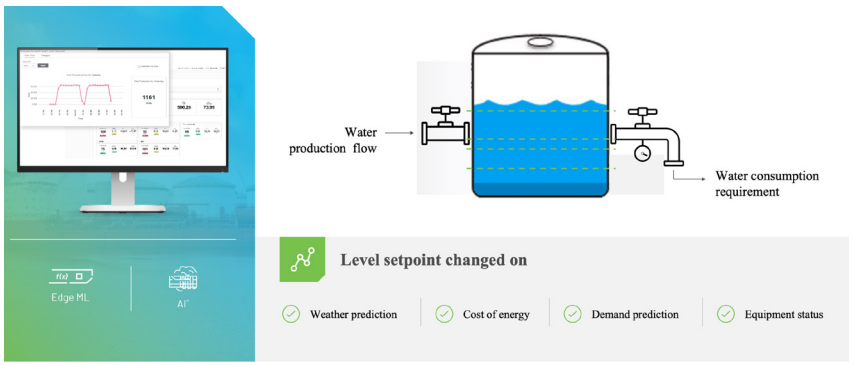

Figure 4 Smart Water Reservoir Management

Use cases

Climate impact/ cost savings, average-size U.S. water processing facility	Key assumptions* ▪ Gallons/person/day: 1000 ▪ KWh/gallon: 0.0034 ▪ Average cost/kWh: US$0.1042 ▪ Percentage of treated water lost/year: 15 percent ▪ **33 percent reduction in leakage** Impact ▪ Water savings: 1.5 billion gallons/year ▪ Energy savings: 4.9 million kWh/year ▪ CO_2 savings: 3882 metric tons ▪ **Facility cost savings: US$512 thousand/year**

* Above figures are based on theoretical assumptions.

Sustainability commitments by Cisco and Rockwell Automation

Cisco has committed to reach net zero emissions across its business by 2040. We are decreasing greenhouse gas emissions for product use, operations, and supply chain. We will also reach net zero for all global Scope 1 and Scope 2 emissions by 2025.

Strategies we plan to use to meet these goals include:

- Increasing the energy efficiency of our products through innovative product design
- Accelerating the use of renewable energy
- Embracing hybrid work
- Investing in carbon removal solutions
- Embedding sustainability and circular economy principles across our business

Learn more about our sustainability commitments on our Corporate Social Responsibility page.

One of 2020's World's Most Ethical Companies, sustainability is central to Rockwell Automation's purpose to make the world more productive and to its promise of Expanding Human Possibility. The company has pledged to reach carbon neutrality for all global Scope 1 and Scope 2 emissions by 2030 with the following actions:

- Achieving ISO 14001 management standards at 20 sites
- Recycling or reclaiming 8102 tons—84 percent—of waste
- Spending US$255 million with diverse suppliers
- Joining the U.S. EPA SmartWay program for responsible logistics management
- Generating $1.6 billion in revenue from energy-efficient products and offering per the Sustainability Accounting Standards Board (SASB) definition

Learn more about Rockwell Automation's sustainability solutions—Environment, Social, and Governance—on our Sustainability page

The bridge to possible

Financing to help you achieve your objectives

Cisco® Capital can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx. Accelerate your growth. Optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. Learn more.

Cisco and Rockwell Automation alliance advantage

Sustainability is the way forward for global societies. As leaders in networking and industrial automation, respectively, Cisco and Rockwell Automation are developing smart and secure water management solutions that focus on sustainability and the responsible use of this precious resource.

Prepare to save water

Is your water management system giving you the visibility into operations you need—visibility that will allow you to detect leaks and take swift action to control them? Get real-time information with Cisco and Rockwell Automation Digital Water Solutions. For more information on the solution and *release time frame*, view Water and Wastewater Solution overview, then contact your Cisco sales representative or Cisco authorized channel partner.

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