Introducing the PI System for water

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Balancing ROI and risk for efficient, proactive operations

Water infrastructure challenges

Aging infrastructure

Changing workforce

Resilience & security

Increasing costs

It’s time to find a new way to work

Where do water infrastructure companies find value?

Energy efficiency

- Track total energy costs and usage
- Reduce pumping costs
- Forecast water demand
- Manage time of use rates
- Leveraging smart water meter data
- Collaborate with power utility

Process optimization

- Keep the utility resilient
- Reduce opex/capex
- Detect and find leaks
- Prevent pipe bursts
- Reduce infiltration
- Reduce chemical costs

Asset health

- Prevent pump failures
- Reduce equipment downtime
- Condition based maintenance of assets
- Manage aging infrastructure
- Maintain asset performance
- Optimize pump schedules

Quality & Safety

- Prevent/track sewer overflows
- Effluent discharge compliance
- Ensure drinking water quality
- Detect algae blooms and other anomalies
- Prevent boil water advisories
- Ensure worker safety
- Secure water sources

Regulatory reporting

- Water quality testing
- National Pollutant Discharge Elimination System (NPDES) reporting
- Operational KPIs
- Monthly compliance reports

Business outcomes enabled by the PI System

Energy efficiency

VEOLIA WATER

YorkshireWater

Process productivity

mpwik WROCŁAW

United Utilities

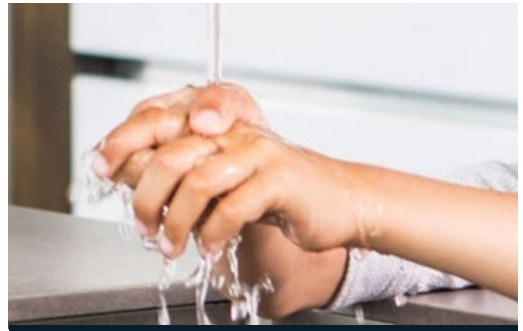
WHITE HOUSE UTILITY DISTRICT

Asset health

San Francisco Water Power Sewer

Thames Water

Maynilad



Quality, safety, & reporting

Georgia Spring Utilities

California Water Service Co.

HRSD

The City of Calgary

Water Corporation

taswater

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150+

utilities serving over 250 million customers in 25 countries rely on the PI System

Los Angeles Department of Water & Power

Journey to an intelligent water system for 4 million customers ↗

Colorado Springs Utilities

O&M savings: 30% in vehicle use, 58% in overtime ↗

Maynilad Water Services

Reduced leaks and cost of leak repairs (>90%), customer complaints and improved energy efficiency by 10% ↗

Taswater

Improved detection methods: 13 hours ahead of previous methods ↗

Customer Results

Colorado Springs Utilities uses visualization to improve water quality

Water quality

Challenge

- Multiple data silos
- Barriers to data access
- Low chlorine residual and high water age
- High CAPEX

Solution

- A centralized data platform
- Environment of data accessibility
- Ability to visualize, analyze and ‘rewind’ real-time data

Benefits

- More efficient operations
- Optimization of water conveyance
- O&M savings: 30% in vehicle use, 58% in overtime

“The best thing is having a single platform for data access.”

Jeannette Ortiz
Systems and Database Lead

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SWCC manages world's largest desalination firm with PI System

Operational efficiency

Challenge

- Data scattered across different formats and plants
- Need to build a "future-proof" system to support evolution of the water landscape

Solution

- A central Water Management System via PI System
- Integration with ESRI GIS, hydraulic model, IT/OT and other systems

Benefits

- Faster decision making
- Increased operational efficiency
- Enhanced performance analysis

“In the new dispatch center, we are able to do operational planning and match demand and supply.”

Abdullah Bin Nasser AlZowaid
Deputy Governor for Operation and Maintenance

Operational awareness – Dashboard with geospatial analysis

Hampton Roads Sanitation District

Challenge

- SQL database of regulatory compliance data growing too large
- Need to keep large amounts of “raw” data
- Many data silos

Solution

- PI System as a robust data infrastructure
- Integration with ArcGIS to track KPIs, trends, and pressures in the system

Benefits

- Rapid system deployment
- Expansion in scope for “future-proofing” OT data
- Improved operational efficiency

“We had a challenge, we needed to plan for future expansion, and PI really was our answer.”

Kim Peterson
Data Analysis Manager

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Asset Health – Managing IoT

Maynilad Water Services

Challenge

- Widely distributed assets in the field
- Many different kinds of sensors and meters
- 60% leakage

Solution

- PI System for data capture, analysis, reports, long-term storage
- Integration with ESRI GIS and other applications

Benefits

- Reduced leaks and cost of leak repairs (>90%)
- 35% fewer customer complaints
- Improved energy efficiency by 10%

“Different systems can share the same IoT data. You’re accessing a single source of truth.”

Francisco Castillo
Senior VP and CIO, Maynilad

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Polish water utility reduces water consumption and downtime

MPWiK OT-IT convergence

Challenge → **Solution** → **Benefits**

- Disparate data sources
- Need for predictive analytics
- Detect leaks and water use

- PI System as a central hub for real-time metering and weather
- Azure Machine Learning for predictive analytics

- Saved 500,000 liters of water in 6 months
- Decreased fault detection time and downtime
- Predictive analysis

“PI System has enabled convergence for IT and OT systems, for real-time data access, for analysis, for visualization.”

Michał Ślósarz
IT Manager

Spill prevention

United Utilities

Challenge

- Untreated sewage spills threaten waterways
- Overflows cause problems with regulatory compliance

Solution

- Online CSO forecasting based on PI System
- Evolutionary Artificial Neural Networks in Matlab developed with University of Exeter

Benefits

- 97% accurate predictions of possible CSO event up to 6 hours ahead
- Prediction of incidents enables proactive management

“Why do we want to identify potential spills?
It means we can get ahead of incidents.”

Kevin Woodward
Technical Manager

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Actionable intelligence

Riverside Public Utilities

Challenge

- Opaque systems, people-dependent processes
- >8 hours/week spent compiling data and reports

Solution

- Implementation of PI System >10 enterprise systems and applications
- Automated processes and streamlined reporting

Benefits

- Cultural shift toward a data-driven, transparent utility
- ROI of >$3 million in 3-5 years from process automation alone

“Now instead of driving the entire line and trying to find a grid sensor blinking, they can see it on a map on their iPhone or iPad.”

CJ Smith
Project Manager, Operational Technology

Smart sewer analytics

TasWater

Challenge

- Sensitive shellfish growing area
- Limited data, variable operating conditions
- Needed advance warning of sewage spills

Solution

- PI System with real-time insights by Nukon
- Seeq Analytics for machine learning
- Real-time pump analytics and condition

Benefits

- Improved detection methods: 13 hours ahead of previous methods
- Future expansion to other failure modes and regions

“We’re hopeful this program can be used wherever our assets are in high-risk areas.”

Alexander Jovcic
Department Manager of Service Operation

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Integration of business process information

SABESP

Challenge → **Solution** → **Benefits**

- Integrate diverse systems and build an environment where the user has quick and reliable access to all information in a friendly interface

- Use the PI Asset Framework's native tools integrated with the PI System's client tools
- Training of key users for knowledge replication and learning culture

- Customer satisfaction increased 20%
- Awarded as the 2nd most reliable public company in São Paulo, 2018 – IBOPE
- Decreased energy usage by 9%

“We now have easy and continuous access to field information, enabling proactivity and preventive action.”

Silvana C.S.S. Franco
Manager of Supply Control

Digital transformation in water accounting

California Water Service

Challenge

- Keep track of cost, price, quality, and location of each gallon to maximize water in CA
- Monthly production reports were plagued by outdated water data, analyzed in manually manipulated spreadsheet reports
- Monthly effort involved many people, cost too much in time and money

Solution

- Re-organized production information architecture into a digital data hierarchy managed by PI AF and PI analytics
- Data hierarchy based on both business information needs and engineering needs
- Each water district has its own standard AF structure that's easy to maintain

Benefits

- Production reporting cut in half
- Improvements in the quantity and quality of data
- 30 separate reports automatically compiled into one report within minutes
- SOX compliance, much easier accounting

“What was before a two-week process is now about a day and a half, and there’s a consensus and auditability about the data that really matters to producing the report.”

Greg Dumas
Chief Technology Officer, DST Controls

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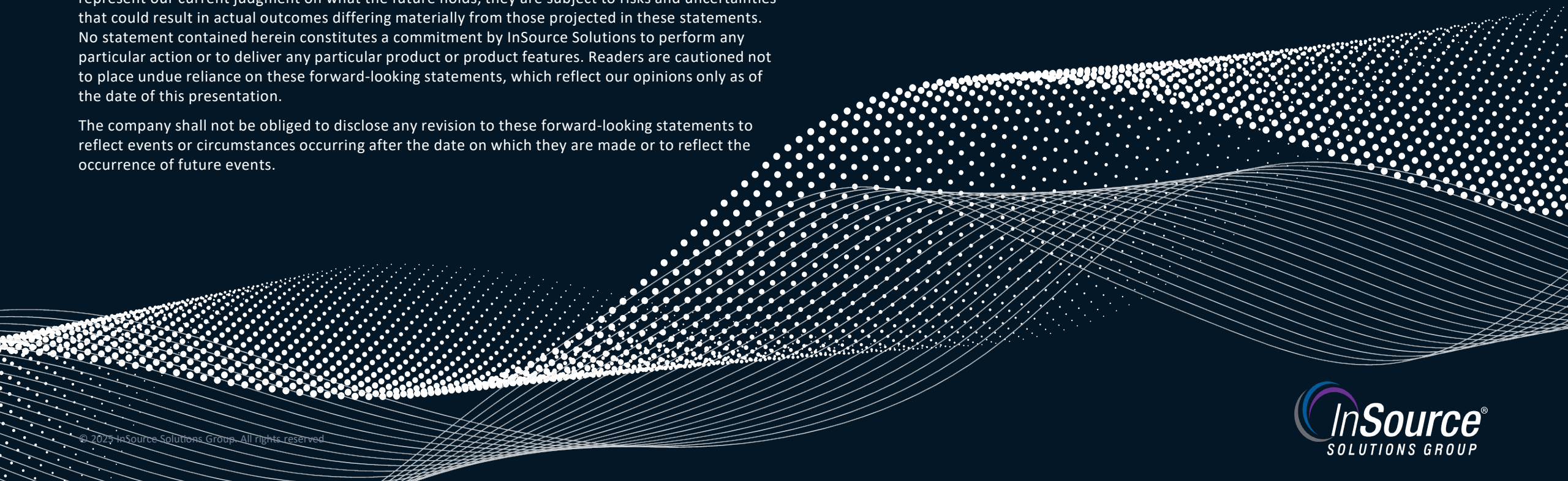

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