Monitoring and Data Management

February 29th, 2024

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER

Providing effective energy strategies for buildings and communities

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

Webinar Outline

Part 1 – Shawn Maurer – SEDAC Overview

Part 2 – Paul Morlock – McEnery Automation

Part 3 – Mike Lunn – Xylem, Inc.

Who We Are

We assist buildings and communities in achieving energy efficiency, saving money, and becoming more sustainable.

We are an applied research program at University of Illinois.

Our goal: Reduce the energy footprint of Illinois and beyond.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER

About the IEPA PWI Energy Efficiency Program

The Illinois EPA Public Water Infrastructure Energy Assessment Program helps municipalities reduce the cost of water and wastewater treatment.

- **No-cost** energy assessments and technical assistance
- Comprehensive report listing:
  - Potential savings
  - Estimated economics
  - Funding sources
- Operator continuing education

Apply at:
www.smartenergy.Illinois.edu/water

Funding provided in whole or in part by the Illinois EPA Office of Energy. This program is in partnership with the U.S. Dept. of Energy Sustainable Wastewater Infrastructure of the Future (SWIFT) Accelerator for energy efficiency in wastewater treatment.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER

Why Complete an Energy Assessment?

Older Existing System or No Previous Assessments?

Identify missed opportunities

Plan for capital improvements

Uncover what is possible

3rd party support for WWTP personnel's ideas

New or Recently Upgraded?

Always more to improve

Plan for future opportunities outside the scope of recent projects

New technologies and processes always in development

Identify opportunities for repairs or upgrades and associated funding!

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER

Apply for an Energy Assessment!

Step 1: Initial Application – Pre-Qualification

- Apply at www.sedac.org/water
- Be located in Illinois and be a publicly-owned plant
- Allow SEDAC/ISTC to visit site – Remote visit is an option!
- Be willing to share facility information
- Share final assessment report with Illinois EPA

Step 2: Data Collection

- Facility information –discharge reports, process flow, etc.
- 2 years of utility bills and DMRs
- We're here to assist!

Step 3: Site Visit Scheduled

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER

McEnery Automation

McENERY Automation

Optimizing Assets & Productivity

Introduction & Overview

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER

Company Overview

- Midwest based, founded in 1993
- 25 Certified Engineers On Staff
- St. Louis based with Redundant co-location in Kansas City
- CSIA Certified Systems Integrator, 1 of 70 in North America
- Rockwell Automation Silver System Integrator
- Aveva Certified Operations System Integrator
- Ignition Gold Certified
- Siemens and FANUC experience
- Business Information Systems, ERPs, Power BI
- Mature Cyber Security Program

Our Partnerships

- Rockwell Automation, Aveva (OSI PI/Historian & Wonderware), ThinManager, and Ignition partnerships mean our engineers are well trained and well supported on the latest technologies deployed at our customer's sites

- Control System Integrators Association (CSiA) Certification means McEnery Automation meets the strict qualifications and implements the same best practices as the country's top System Integrators

SILVER
System Integrator
A ROCKWELL AUTOMATION PARTNER

AVEVA
CERTIFIED OPERATIONS
System Integrator

Ignition!
Gold Certified
8.1

csia
CERTIFIED

THINMANAGER
A ROCKWELL AUTOMATION TECHNOLOGY

OSIsoft.
partner

Water & Wastewater

- Our engineers have played a key role in ensuring reliable water treatment and supply across the US for the last 25 years.

- Our team of engineers with a strong water / waste water background. To date, we have logged 55,000+ hours on 200+ projects in this field.

SCADA – An Overview

Supervisory Control and Data Acquisition

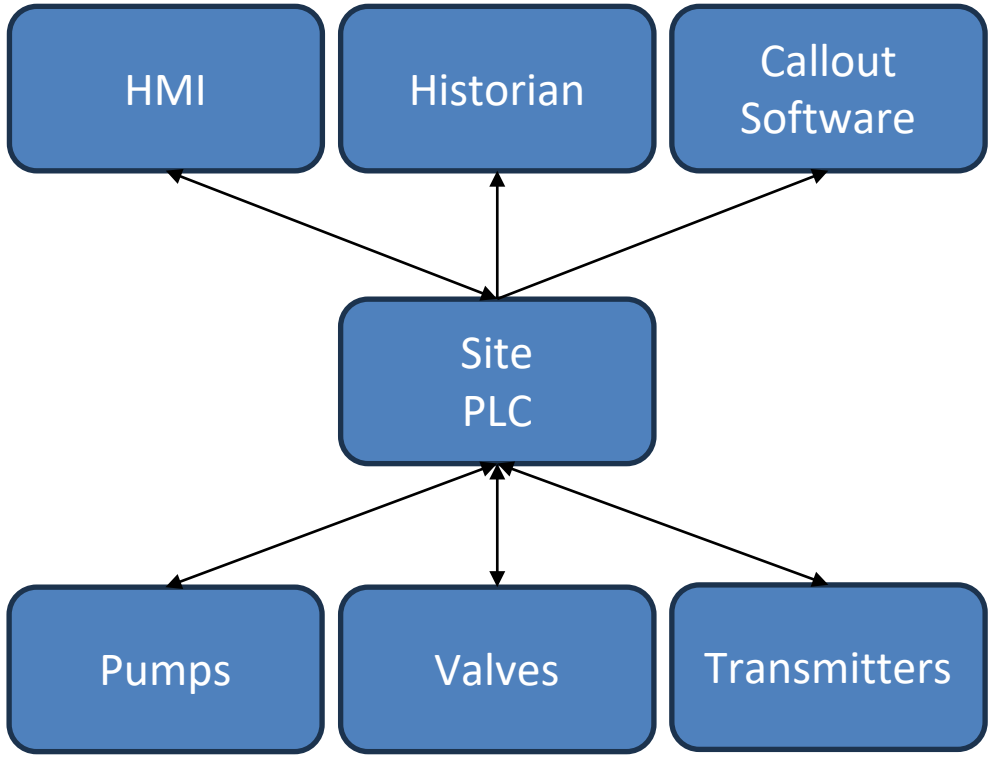
- Basic SCADA model for a Wastewater site
- Importance of SCADA in Wastewater
- Utilizing SCADA for Plant Performance
- Key Data Points for WWTP Efficiency

Basic WWTP SCADA Model

Level 3
Supervisory

Level 2
PLC

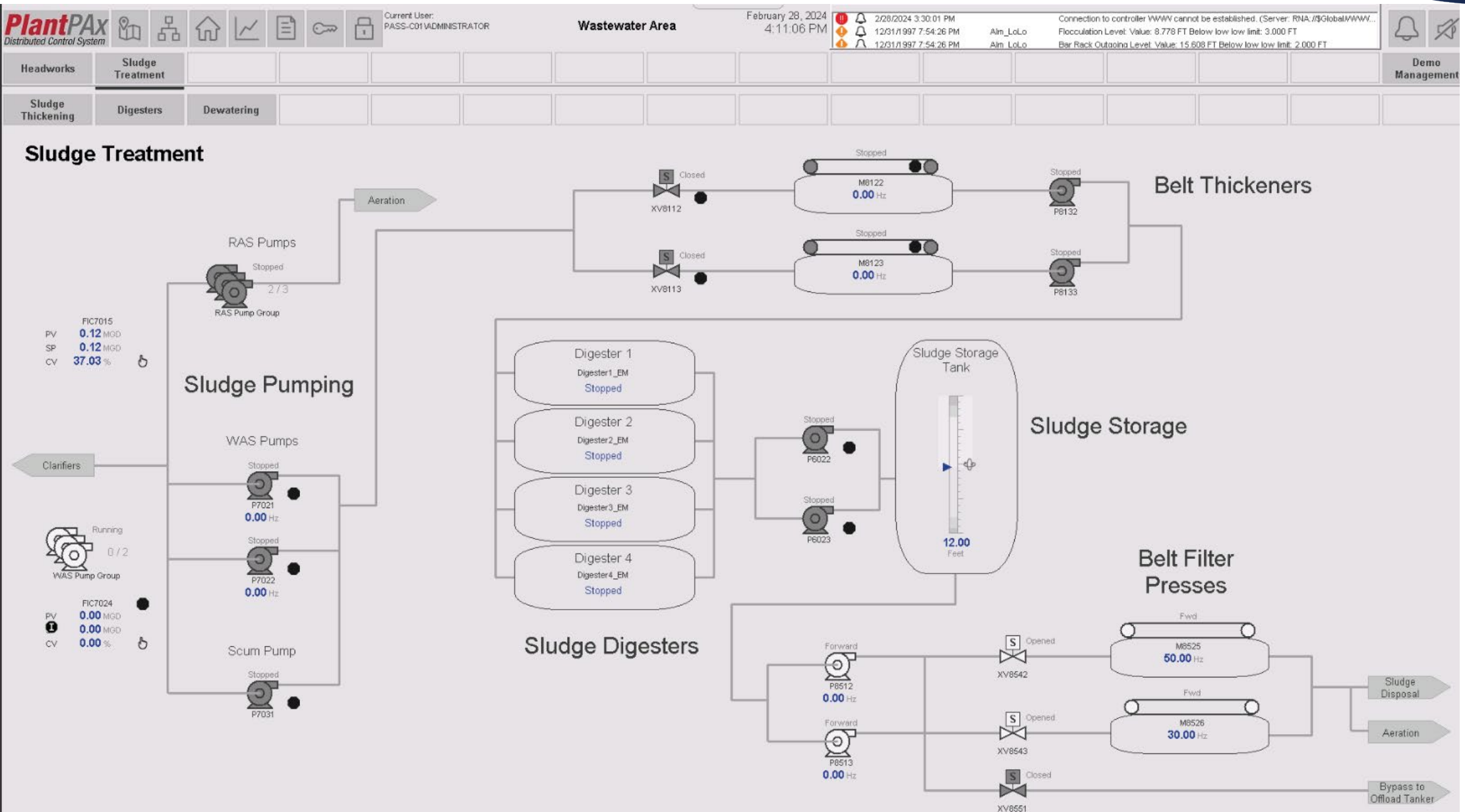
Level 1
Plant Devices



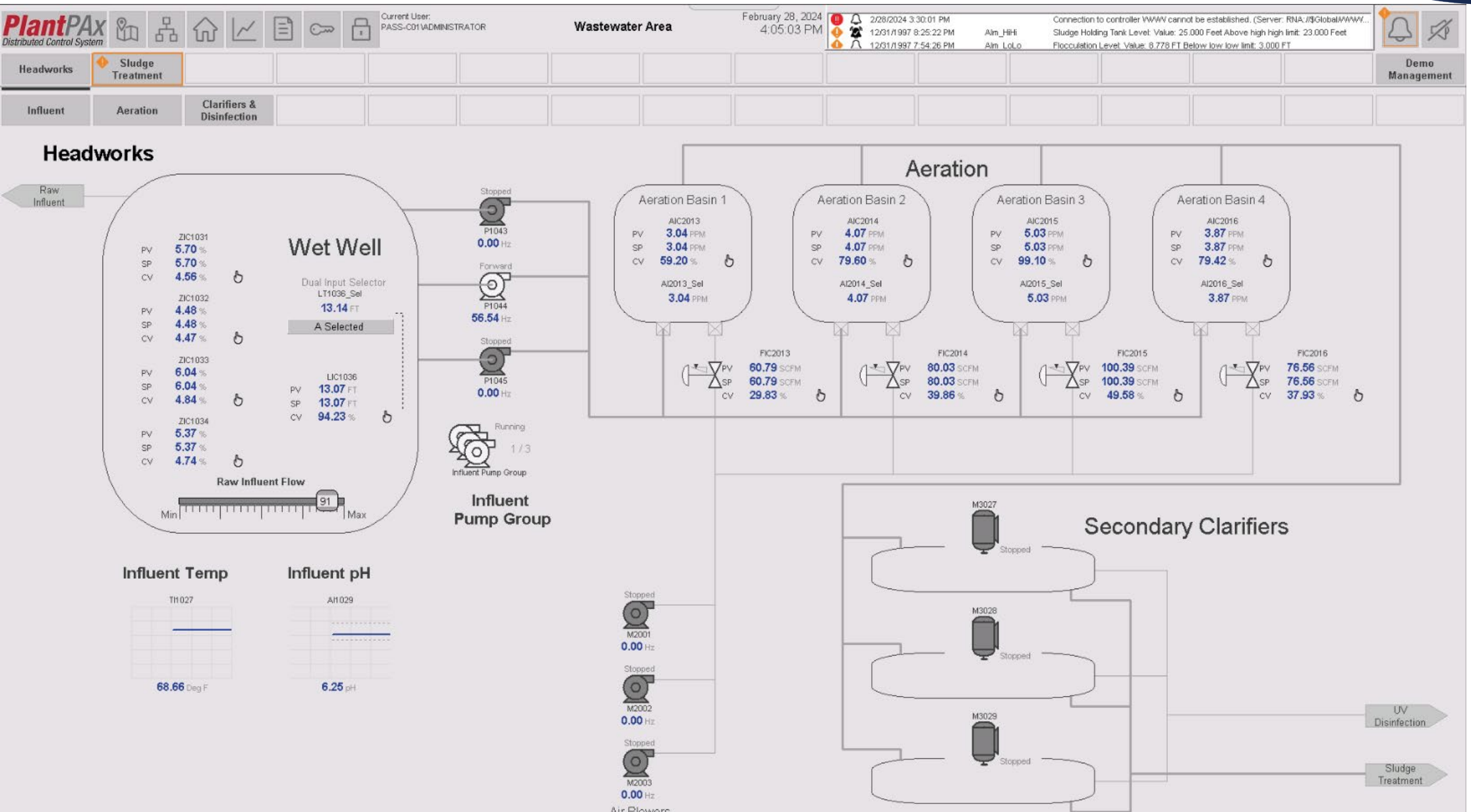
Importance of SCADA in Wastewater

- Increased visibility for Operators
- Decrease in response time
- Consolidated plant controls for simpler interface
- Report generation
- Data validation

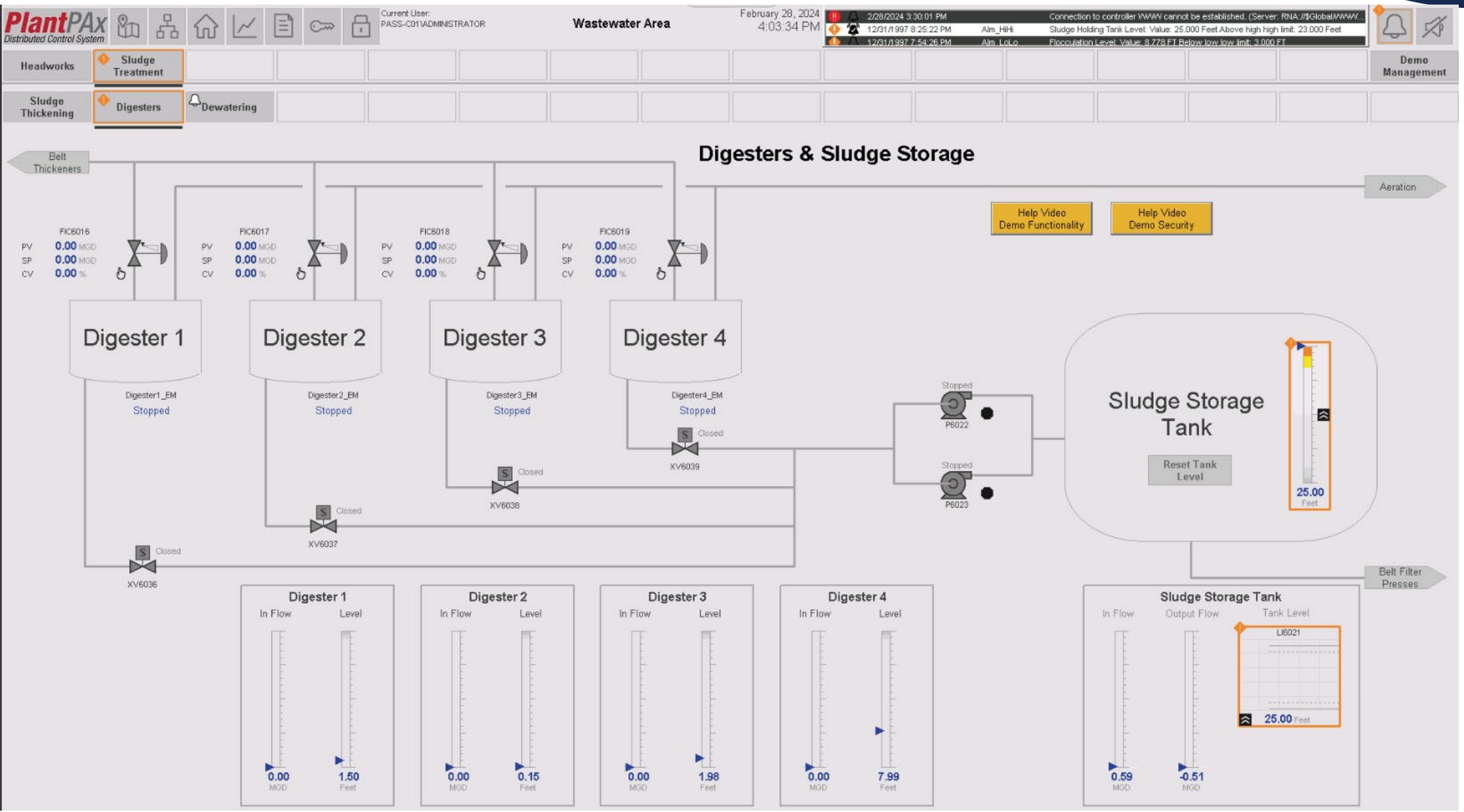
High Performance Plant Overview



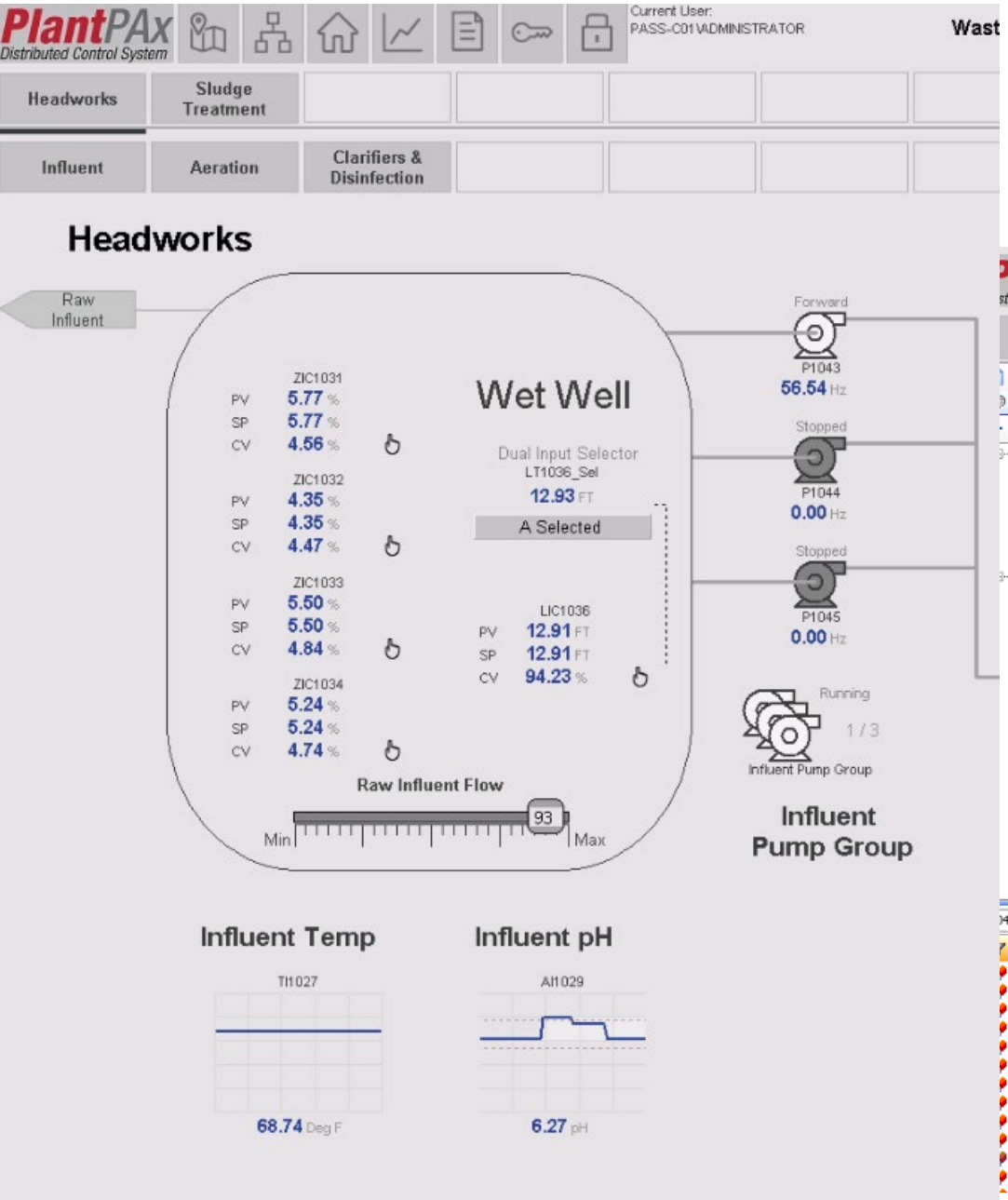
High Performance Alarming

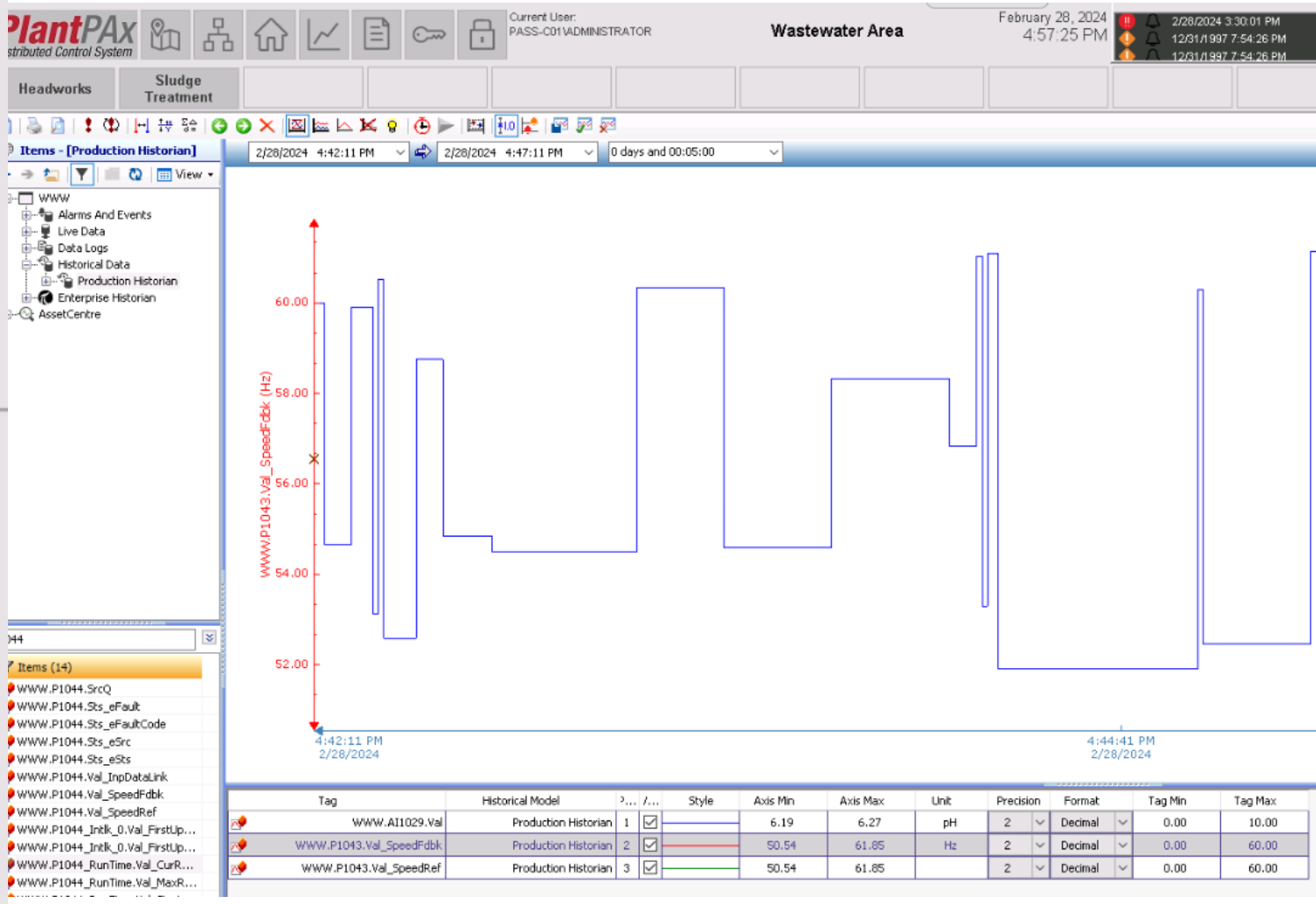


High Performance Alarming



Troubleshooting with Trends





Report Generation

On-Demand Reports - Monthly Plant Efficiency

Options

- STATE
  - State Chemical Feed
  - State Fluoridation
- FACILITY
  - Monthly Plant Efficiency
  - Monthly Pump and Flow
  - Monthly Flow Comparison
  - Monthly Weather Summary
  - Monthly Well Summary
  - Annual Well Summary
- OPERATIONS
  - Water Distribution
  - Chemical Analysis
  - Daily Alarm Activity
- DATA ENTRY
  - State Alarm Log
- Report Templates

Refresh | Instance

Date

Month 01 January 2021

End 01 February 2021

Save | Print | Email | Freeze Panes | Zoom In | Zoom Out | Keypad

Monthly Plant Efficiency

Facility Jersey Water Treatment Plant PWS No. 300850

Month/Year January, 2021

Date	WTF Raw (kgal)	WTF Treated (kgal)	Waste (kgal)		Efficiency %
Fri 1	935	730	205		78%
Sat 2	809	713	96		88%
Sun 3	532	461	71		87%
Mon 4	812	708	104		87%
Tue 5	800	700	100		88%
Wed 6	834	725	109		87%
Thu 7	768	670	98		87%
Fri 8	794	692	102		87%
Sat 9	794	692	102		87%
Sun 10	794	692	102		87%
Mon 11	787	686	101		87%
Tue 12	770	670	100		87%
Wed 13	714	622	92		87%
Thu 14	761	669	92		88%
Fri 15	0	0	0		0%
Sat 16	0	0	0		0%
Sun 17	282	243	39		86%
Mon 18	772	680	92		88%
Tue 19	830	730	100		88%
Wed 20	771	679	92		88%
Thu 21	785	690	95		88%
Fri 22	792	695	97		88%
Sat 23	492	432	60		88%
Sun 24	746	651	95		87%
Mon 25	789	688	101		87%
Tue 26	728	639	89		88%
Wed 27	793	694	99		88%
Thu 28	783	685	98		87%
Fri 29	806	702	104		87%
Sat 30			0		0%
Sun 31	780	685	95		88%
Total	21,053	18,323	2,730		
Average	702	611	88		
Maximum	935	730	205		

Data Entry Forms - Daily Weather Reading

Options

- Form Templates
  - Daily Weather Reading

Refresh | Store | Lock

Date

Month 01 January 2021

End 01 February 2021

Save | Print | Freeze Panes | Zoom In | Zoom Out | Keypad

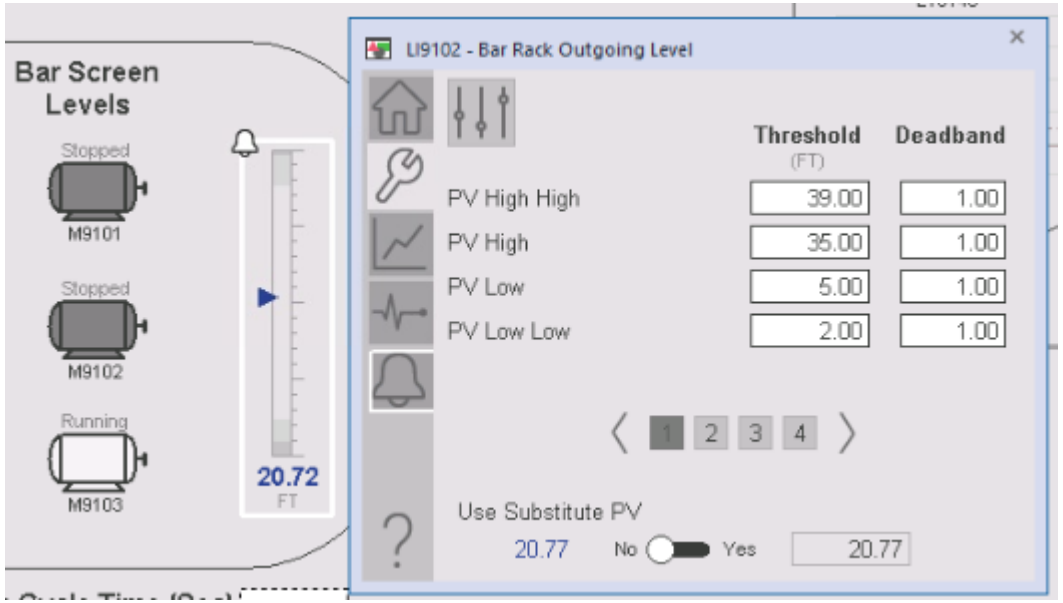
Daily Weather Readings

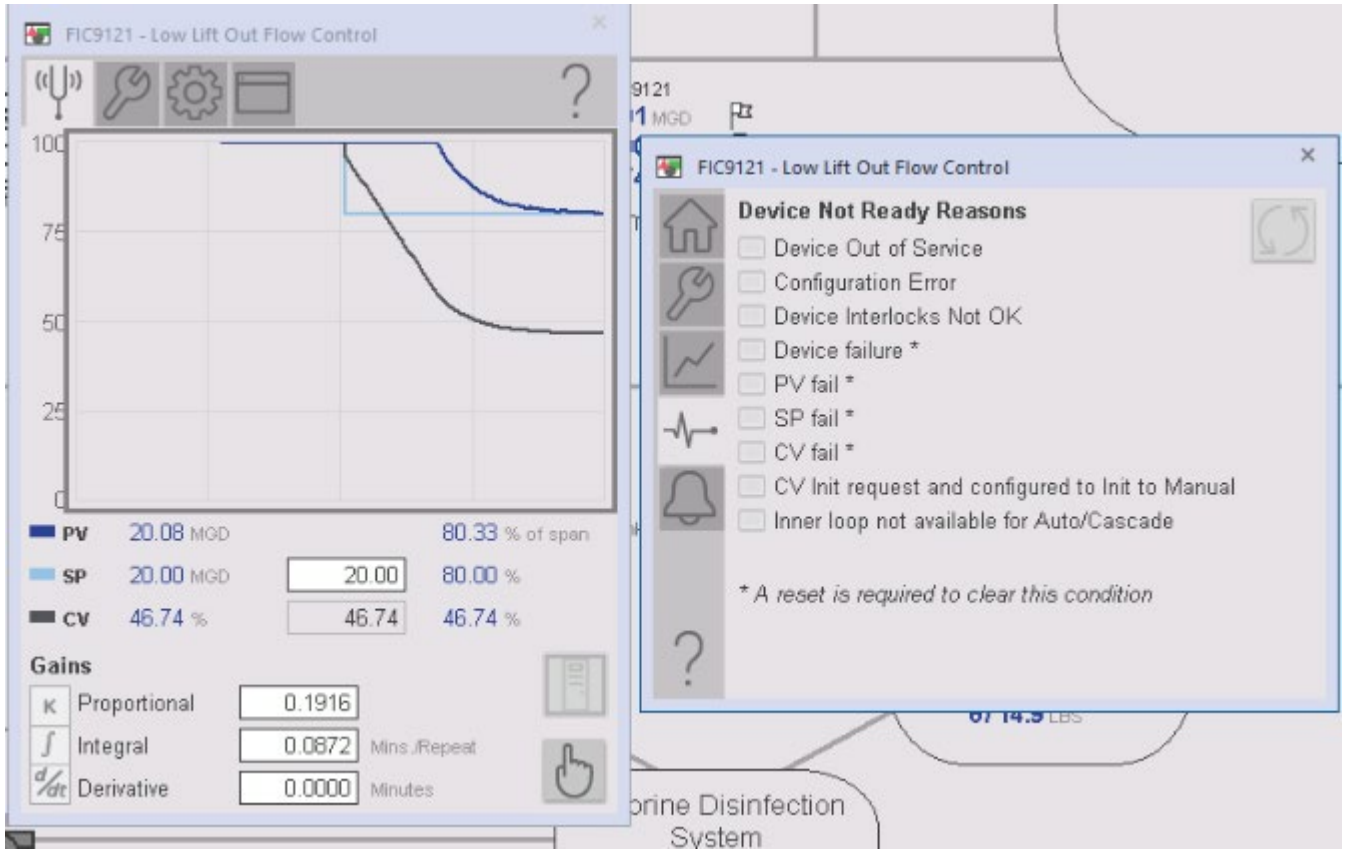
Month/Year January, 2021

Date	Air Temp (F)	Water Temp (F)	Snow Fall (in.)	Rain Fall (in.)	Reservoir (ft)	Weather Comment	Recorded By
Fri, 1							
Sat, 2							
Sun, 3							
Mon, 4							
Tue, 5							
Wed, 6							
Thu, 7							
Fri, 8							
Sat, 9							
Sun, 10							
Mon, 11							
Tue, 12	33		11.5	0.85		snow	
Wed, 13							
Thu, 14	17					clear	
Fri, 15	2					sunny	
Sat, 16	27					cloudy	
Sun, 17	15					cloudy	JC
Mon, 18							
Tue, 19	36			0.9		cloudy	JC
Wed, 20	25					sunny	
Thu, 21	24		3	0.28		cloudy	
Fri, 22	10		4.1	0.22		sunny	
Sat, 23	-5					sunny	
Sun, 24							
Mon, 25	12		1.2			snow	
Tue, 26	12		0.8			cloudy	
Wed, 27	30		12			snow	
Thu, 28	11					sunny	
Fri, 29	24					sunny	
Sat, 30	9					sunny	
Sun, 31							

Plant Performance

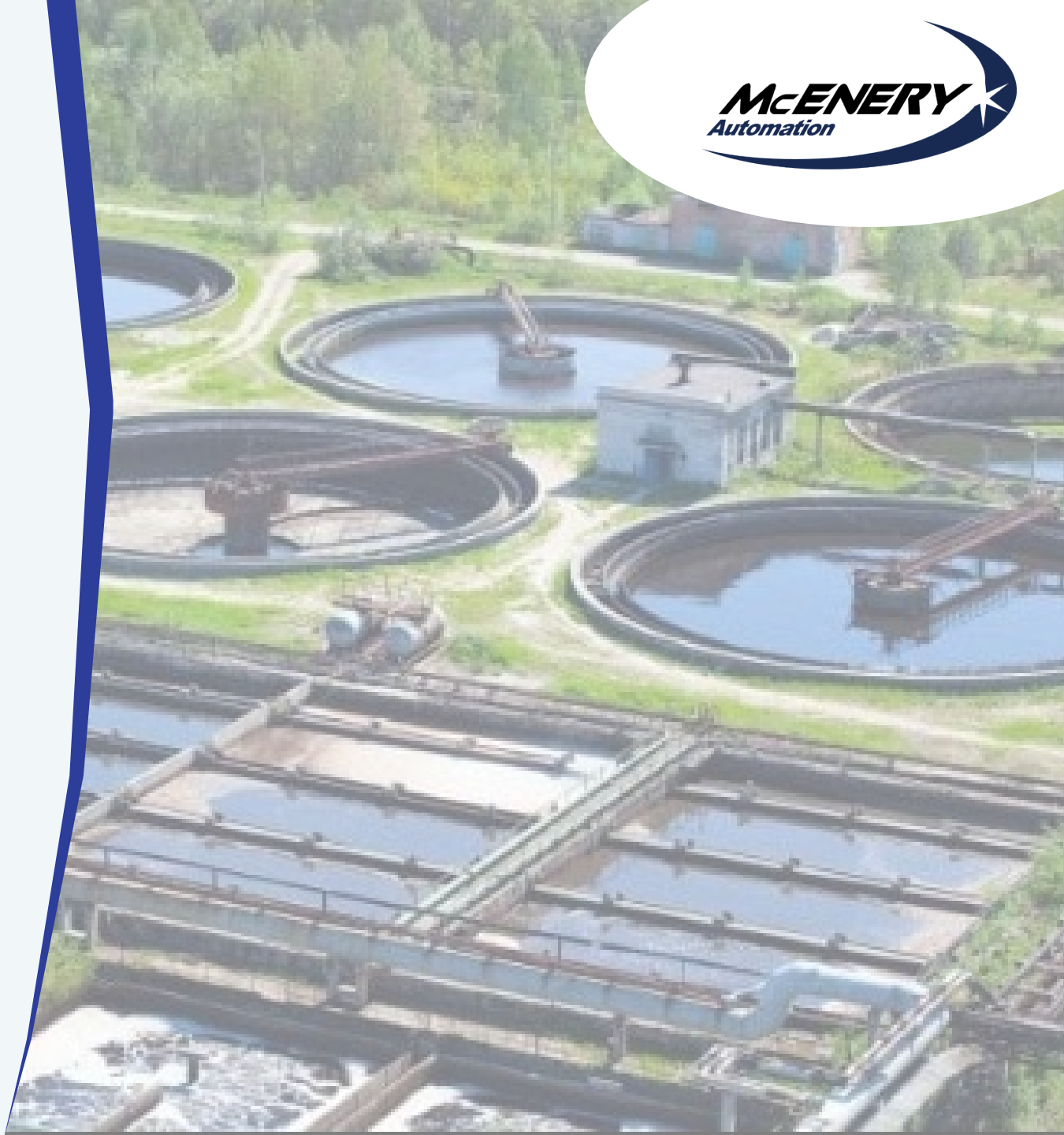
- Real-time data for early detection of equipment issues
- Predictive maintenance using SCADA information
- Enhancing operational efficiency through equipment performance tracking
- Monitoring of key equipment for energy efficiency





Key Data Points for WWTP Efficiency

- Flow rates and volumes
- Chemical dosing and usage
- Biological process parameters
- Sludge Management
- Energy Consumption



Thank you!

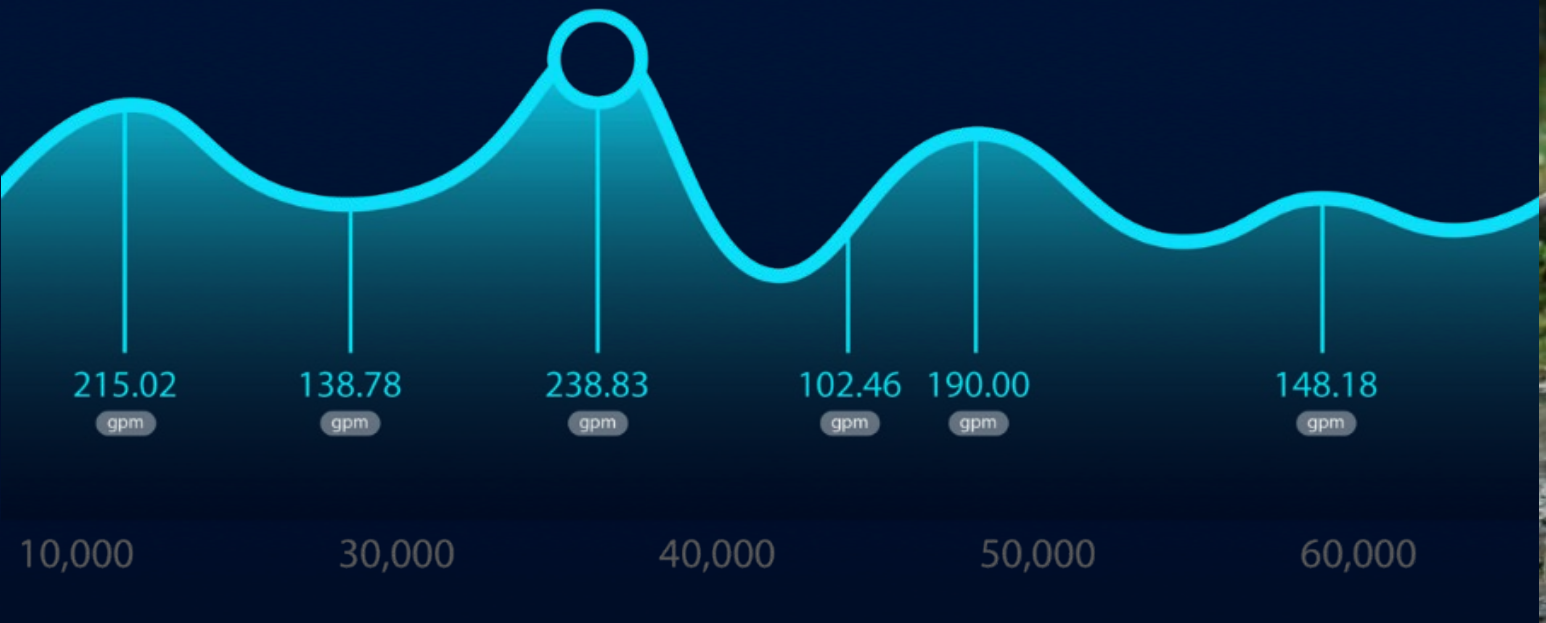
Xylem, Inc.

xylem
Let's Solve Water

Last Revised: February 26, 2024

IEPA Webinar 2/29/2024

Mike Lunn, Sr. Product Solutions Architect



Xylem's Brands

Bell & Gossett
Pumps, Valves,
Heat Exchangers & Accessories

FLOJET
Small Pumps, Motors &
Dispensing Pumps

FLYGT
Submersible & Column Pumps
& Mixers

godwin
Dewatering Pumps

GOULDS WATER TECHNOLOGY
Centrifugal Pumps
& Boosters

JABSCO
Marine Waste &
Flexible Impeller Pumps

LEOPOLD
Gravity Media
Filtration & Clarification

LOWARA
Pumps, Drives &
Circulating Solutions

mjk
Intelligent Monitoring
& Control Equipment

Technologies for Inspection,
Monitoring & Management
of Infrastructure

rule
Bilge Pumps

SANITAIRE
Biological Treatment

SENSUS
Smart Metering & Communications

WTW
Lab & Process Monitoring
Solutions

WachsWater SERVICES
Solutions to Optimize & Control
Liability of Aging Infrastructure

WEDECO
UV Disinfection & Ozone

YSI
Lab, Process, & Environmental
Monitoring Solutions

xylem
Let's Solve Water

Corporate Social Responsibility

For over 11 years, Xylem employees and our partners have engaged together to create community value

4.8+ MILLION
lives benefitted from access to safe water and sanitation since 2019 alone

70+
countries where Watermark operates

230,000+
volunteer hours over 5 years

xylem watermark

xylem
Let's Solve Water

Delivering on the promise of safe, compliant, always operational water is harder than ever.

SEVERE WEATHER IS INTENSIFYING

BUDGETS ARE CONSTRAINED

REGULATIONS ARE INCREASING

xylem
Let's Solve Water

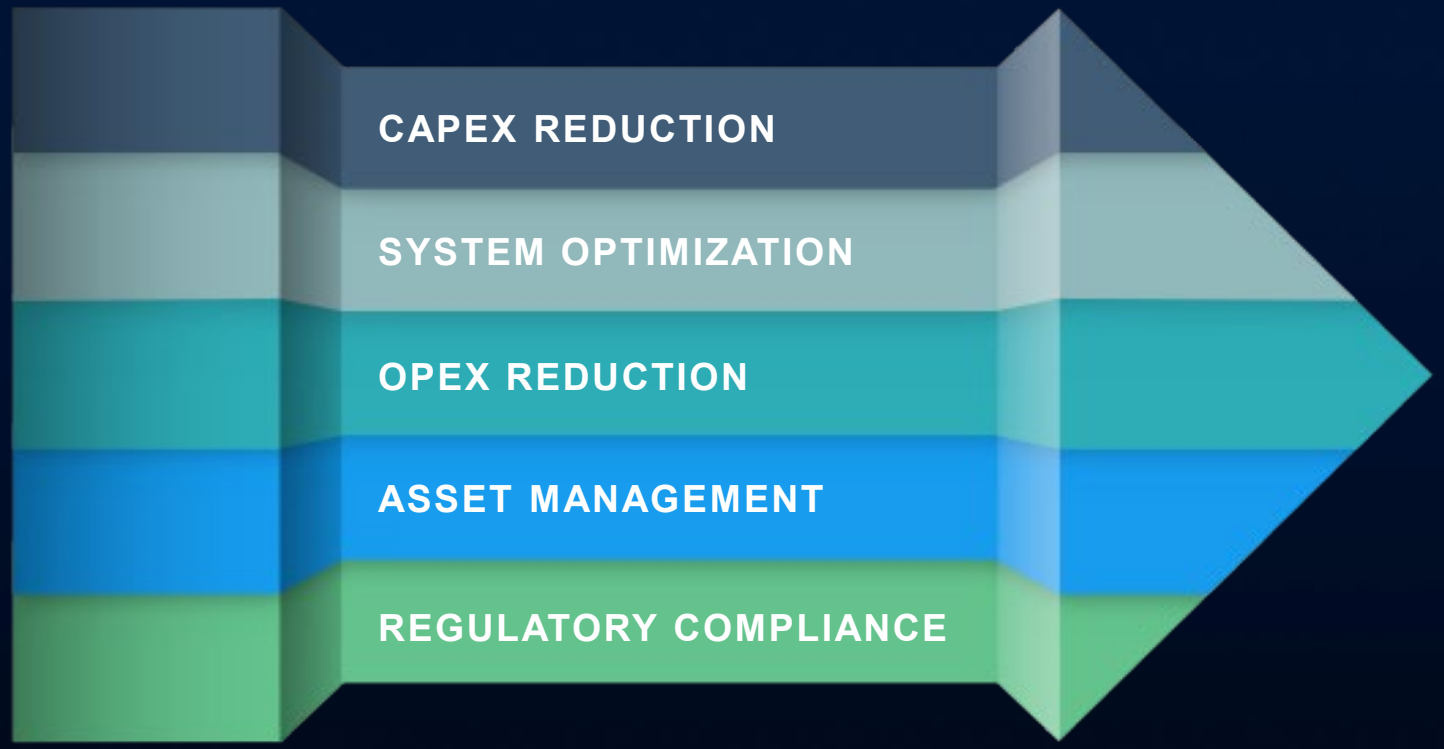
DATA INVENTORY

SCADA	LAB	Regulatory	Asset Management	Other

• Process
• Historian
	• LIMS
	• Bench sheet
	• Spreadsheet
		• Reports
		• Compliance
			• GIS
			  • Collection
			  • Distribution
			• Assets
			• Labor
				• IPP
				• Backflow
				• Lead Lines
				• SOPs

There is no shortage of data – unlocking it is the challenge

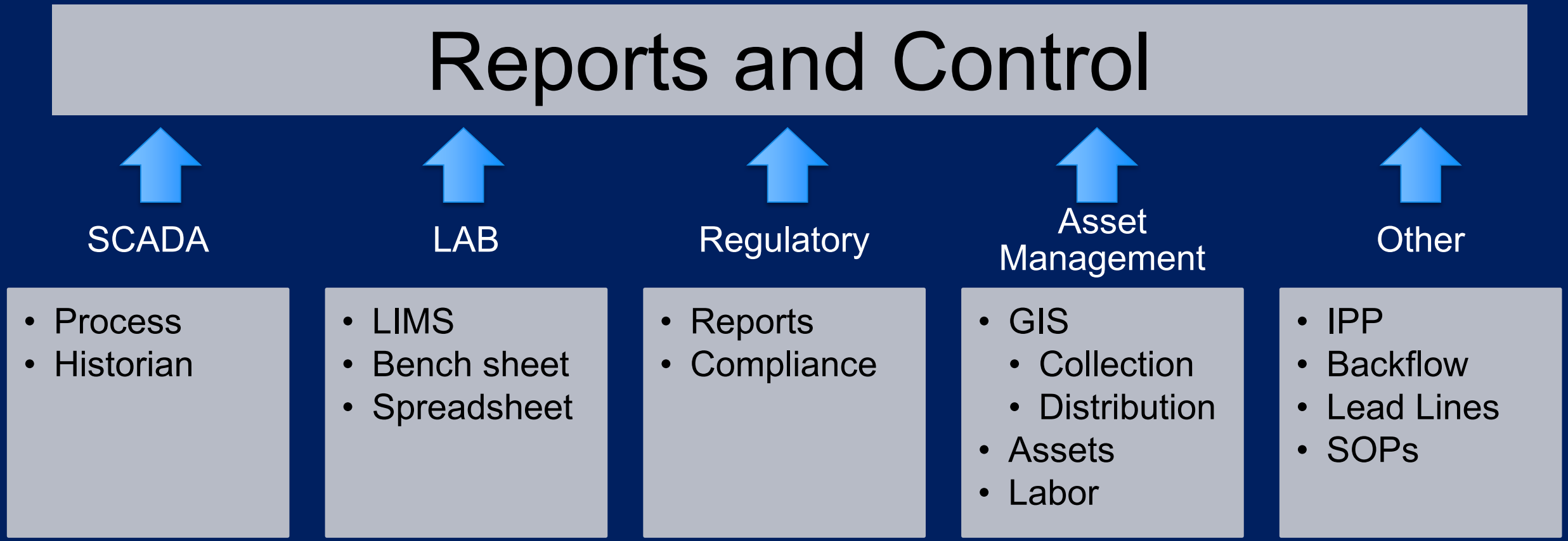
SOLVING THE PROBLEMS THAT KEEP YOU UP AT NIGHT



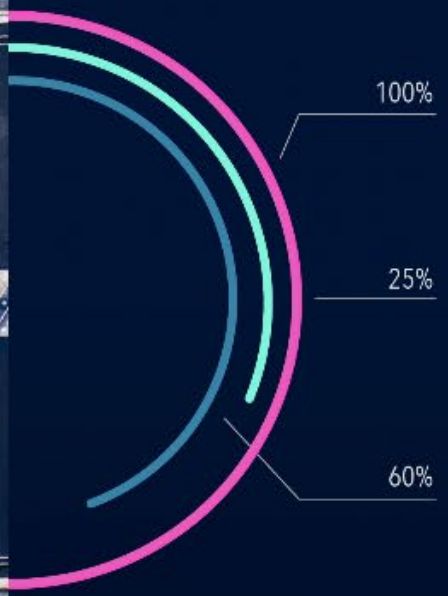
Safe, affordable, always-on water & sewer

xylem
Let's Solve Water

DATA INTEGRATION



xylem
Let's Solve Water



OPEX Areation

What am I interested in first?

- Manual
- DO
- Ammonia
- Digital Twin

Do I have the Data?

What else do I need?

- Sensors
- Lab
- Control

xylem
Let's Solve Water

Mike Lunn, Sr. Product Solutions Architect
Michael.Lunn@xylem.com

Thank you.

xylem
Let's Solve Water

Questions?

sedac-info@illinois.edu
800-214-7954

www.smartenergy.Illinois.edu/water

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER