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USERS CONFERENCE 2016

April 4-8, 2016 | San Francisco

TRANSFORM YOUR WORLD

Get the Most Out of Your Assets with the PI System and Maximo

Presented by **Paul Bonitz, SFPUC Wastewater**
Lisa M. Slaughter, DST Controls

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Services of the San Francisco Public Utilities Commission

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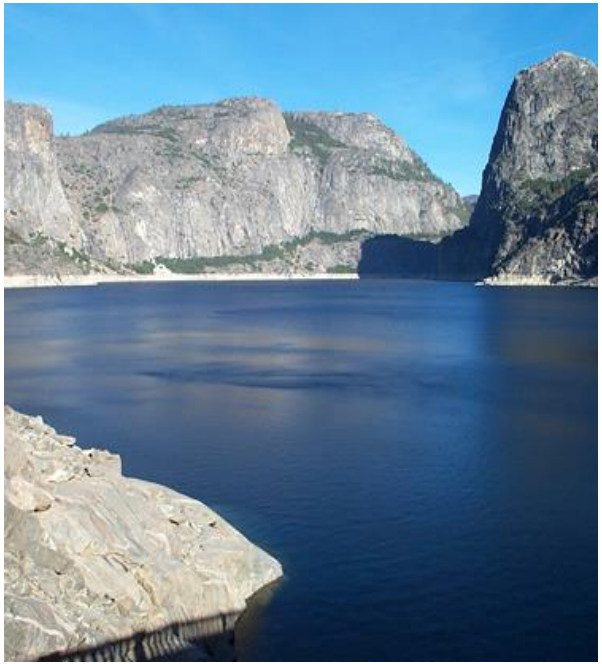
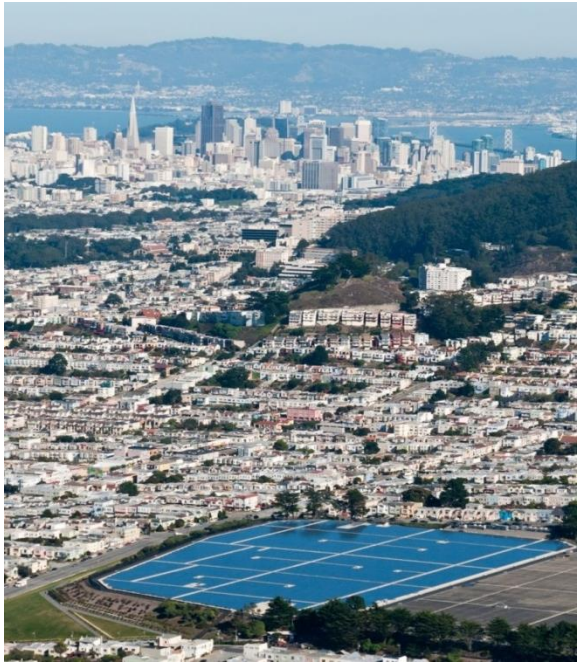
WATER



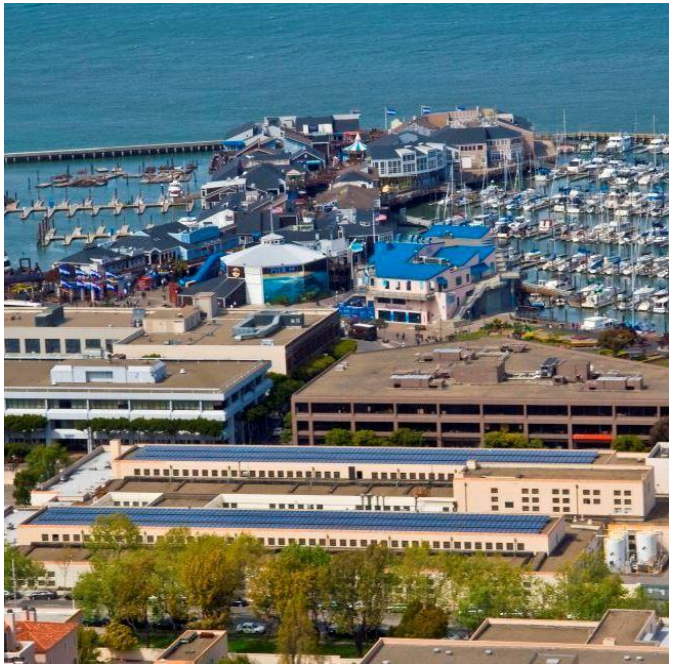
Hetch Hetchy Reservoir

POWER



Solar Panels at Sunset Reservoir

WASTEWATER



North Point Wet Weather Facility

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About Wastewater Enterprise (WWE)

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- The city under The City
  - Wastewater Enterprise (WWE) operates and maintains the ects and trea
  - 1,00
  - 27 p
  - 3 treatment plants
  - 8 deep water outfalls

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San Francisco Overview

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How much water can we treat?

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- Wastewater Enterprise (WWE) has 2 major and 1 standby sewage treatment plants.
  - Southeast Plant (SEP) –treats up to 250 MGD (1G = 3.78L)
  - Oceanside Plant (OSP) –treats up to 65 MGD
  - North Point Plant (NPP) –activated during major rain events, treats up to 150 MGD (during major rain events only)
  - There are 27 sewage collection stations scattered throughout SF which pump flows to these treatment plants

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That's a lot of assets!

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- We have over 325,000 assets
  - 310,000 collection system assets
  - 15,000 treatment plant and pump station assets
- Many may be at the end of their expected useful life
- How do we maintain all these assets?
- Implement an asset management program to make more informed capital and maintenance decisions with limited funding

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About the WWE Asset Management Program

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- A set of integrated processes that minimize the life-cycle costs of Wastewater Enterprise assets at an acceptable level of risk, while continuously delivering established levels of service.
- Strategic Business Plan Goal A Objective 1: “Optimize the lifecycle of WWE physical assets.”
- Develop processes to “minimize the life-cycle costs of Wastewater Enterprise assets.”

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Condition Based Maintenance (CBM)

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- Maintenance is triggered by real-time data
- Much more efficient than performing work on a calendar-based schedule
- Avoids situations where work is performed even though the asset was not used
- Avoids unnecessary maintenance

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Benefits of CBM

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- Minimizes costs
  - Labor savings (> Wrench Time)
  - Fewer parts required
  - No more time spent manually generating work orders
- Improved business process
  - Reduction in paperwork and administration by generating fewer work orders
  - More accurate data in Maximo

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The Pilot: PI Meter Data to Maximo

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- Asset RunHours already being captured by PI System
- Assets already being tracked by Maximo
- Automatically input PI RunHours data into Maximo
- Automatic work order generation
- 1 Month = 720 hours -> 5 hours
- Quarterly = 2160 hours -> 15 hours
- Semi-Annual= 4320 hours -> 30 hours
- Annual = 8640 hours -> 60 hours
- 1/144 scale pilot as proof of concept

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Old-School Process

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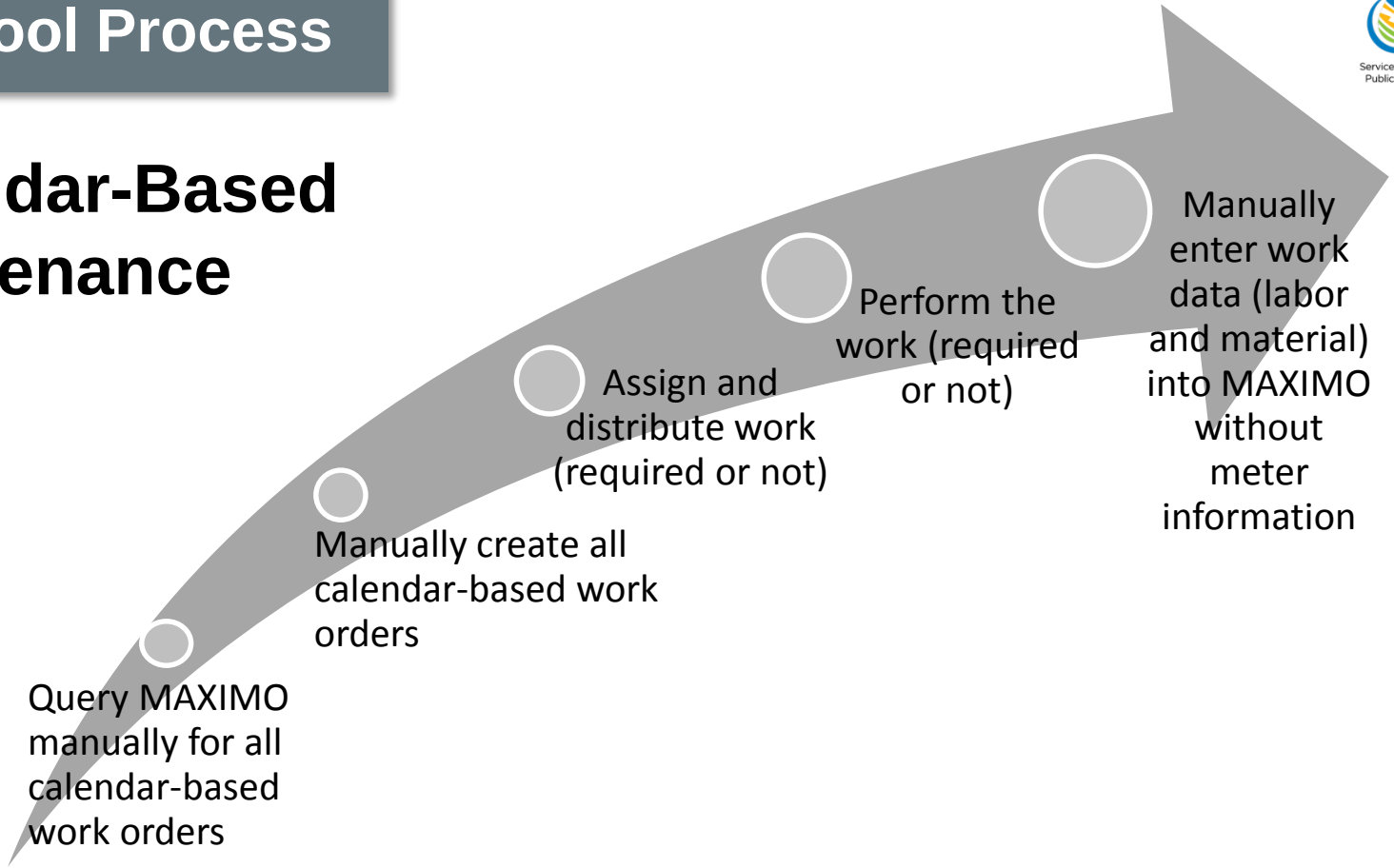
Calendar-Based Maintenance



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Benefits of CBM

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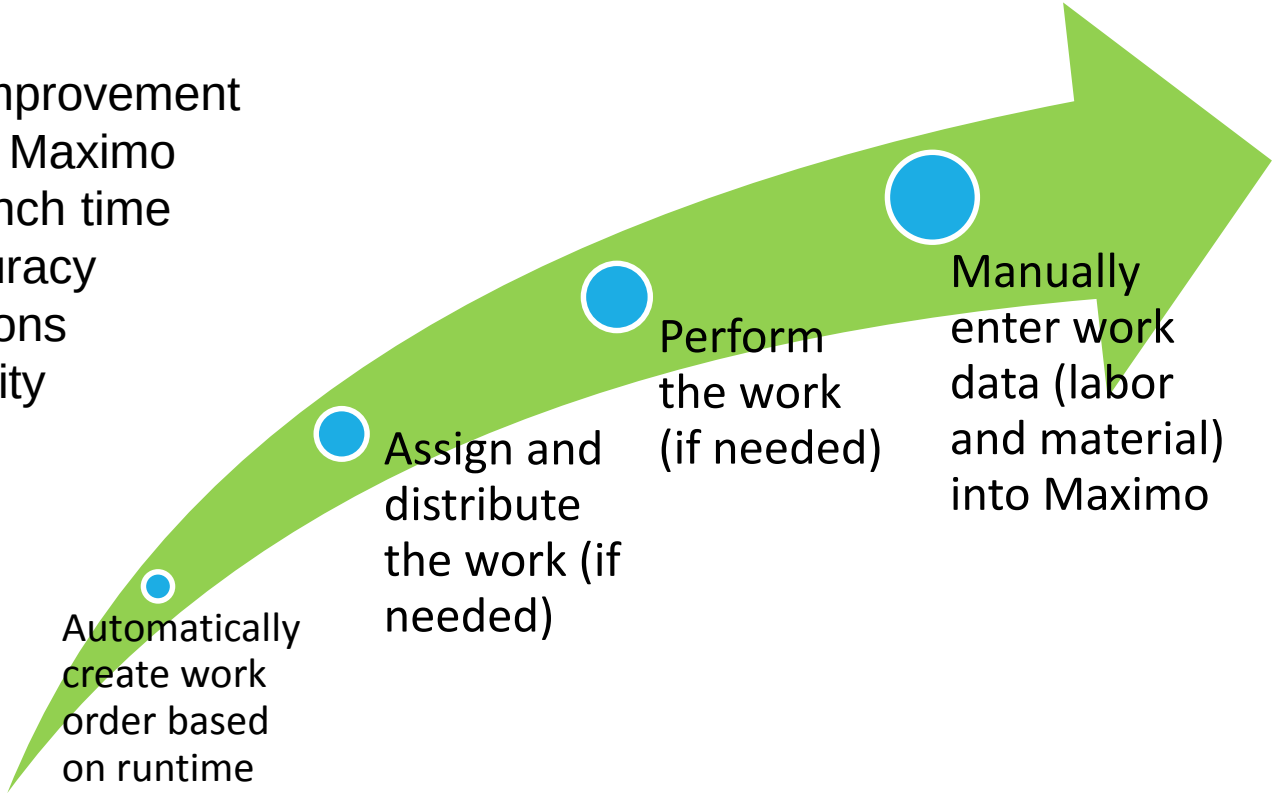
- Business process improvement
- Maximizing value of Maximo
- Increased crew wrench time
- Increased data accuracy
- Streamlined operations
- Increased Productivity



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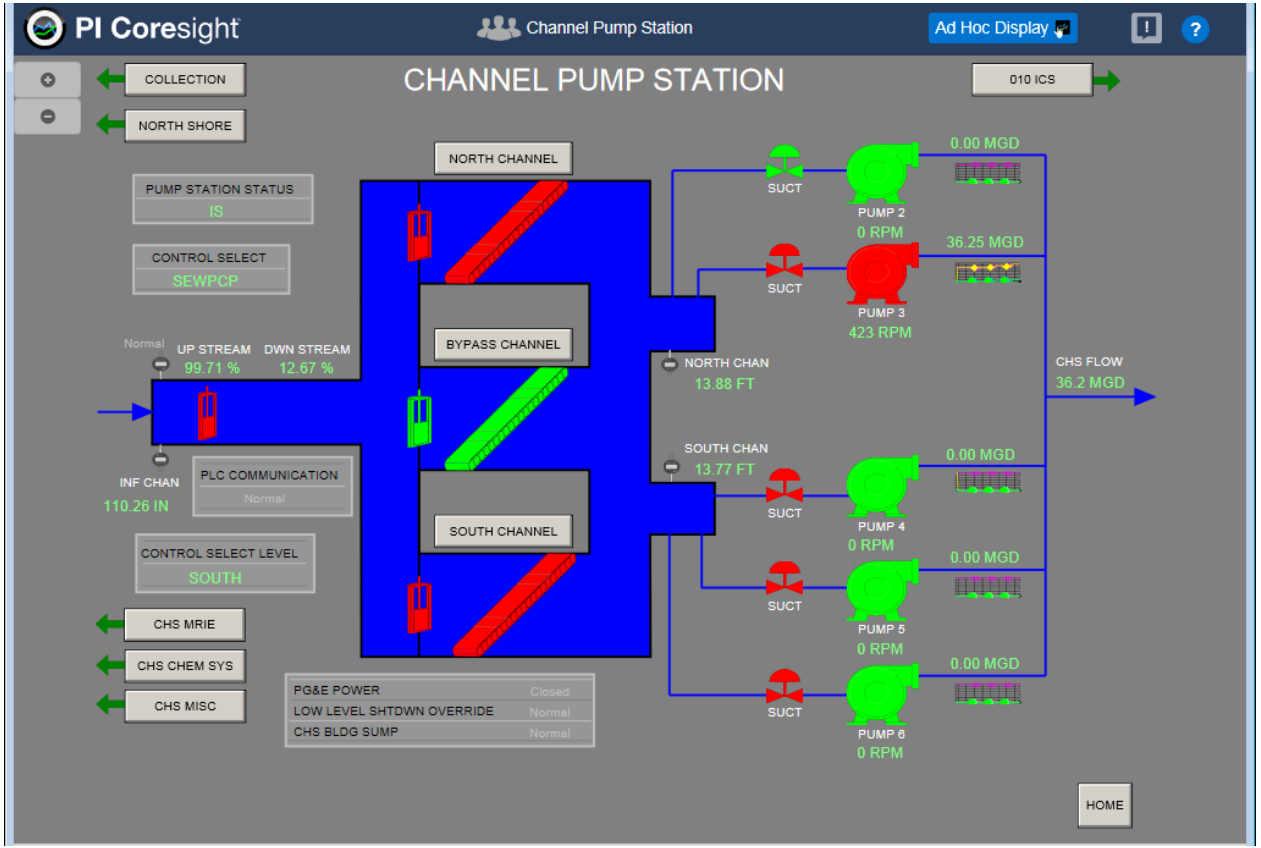
Channel Pump Station (CHS)

- It is a dry and wet weather pump station, which operates 24/7
- Dry weather flows average 40 MGD with a maximum wet weather capacity of 103 MGD



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The Solution

AF SDK

PI-Maximo Data Bridge

REST API

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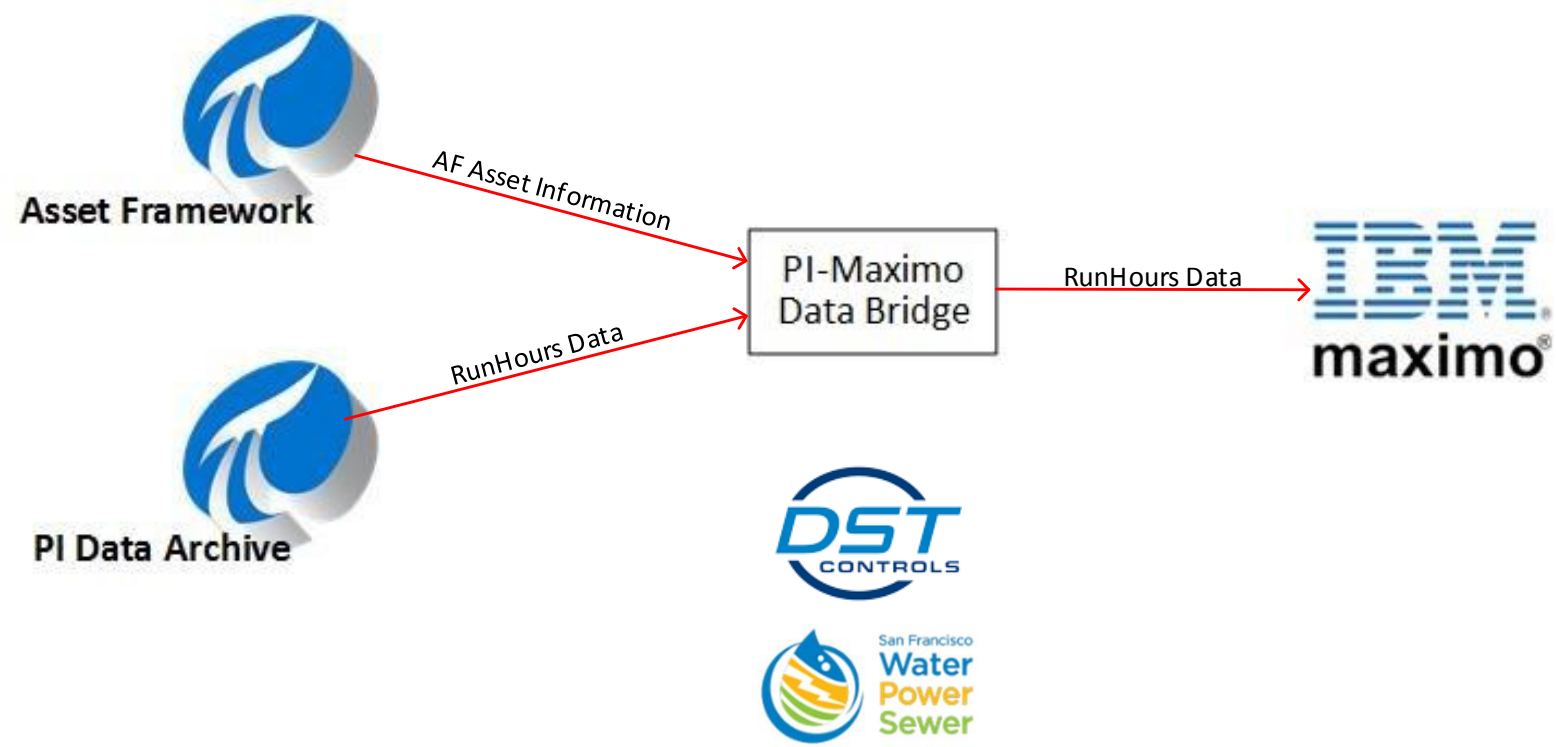
The Solution: Data Flow



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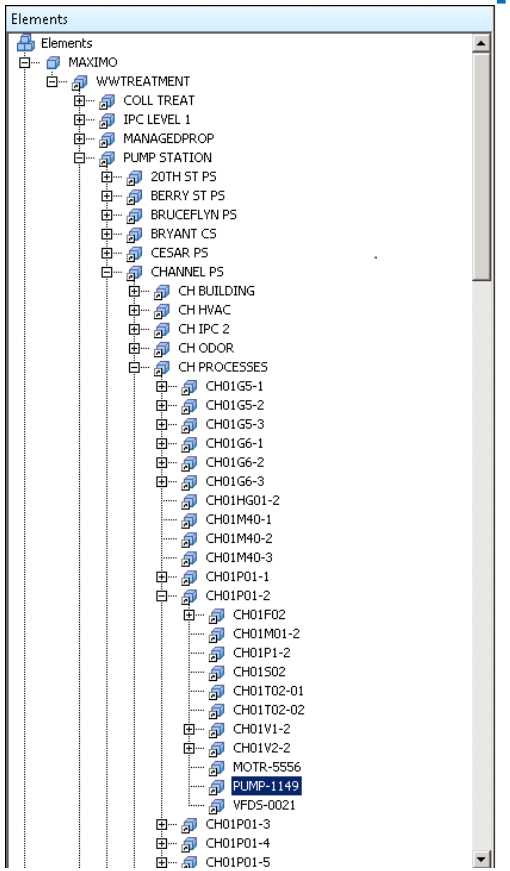
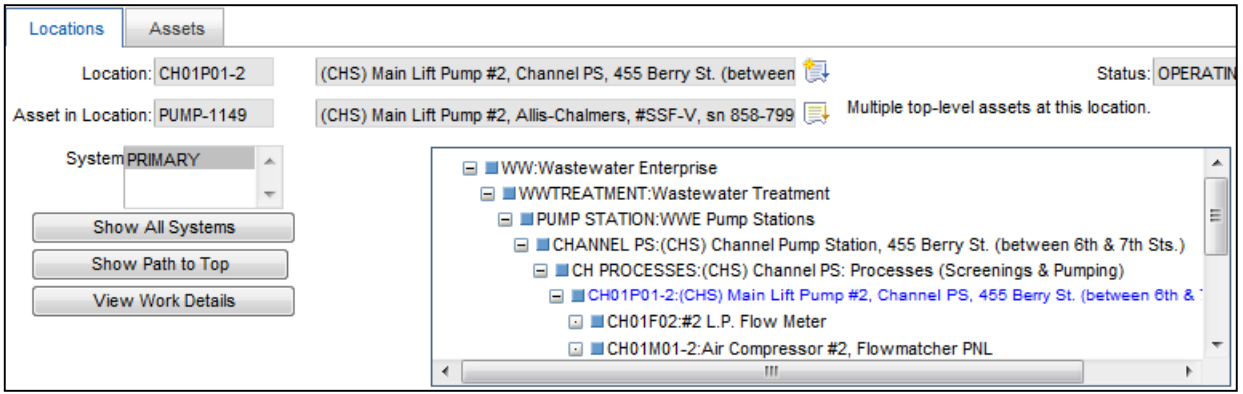
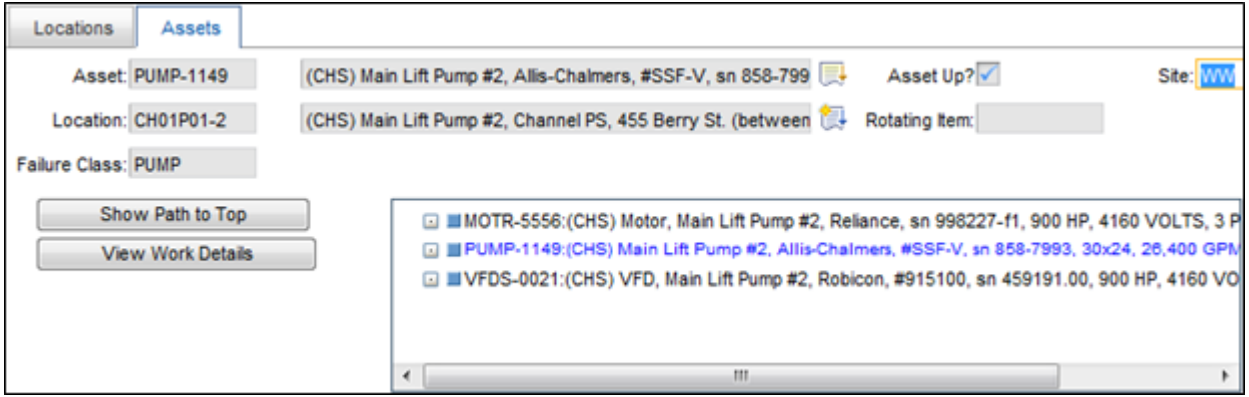
The Solution: Mapping Asset Framework to Maximo







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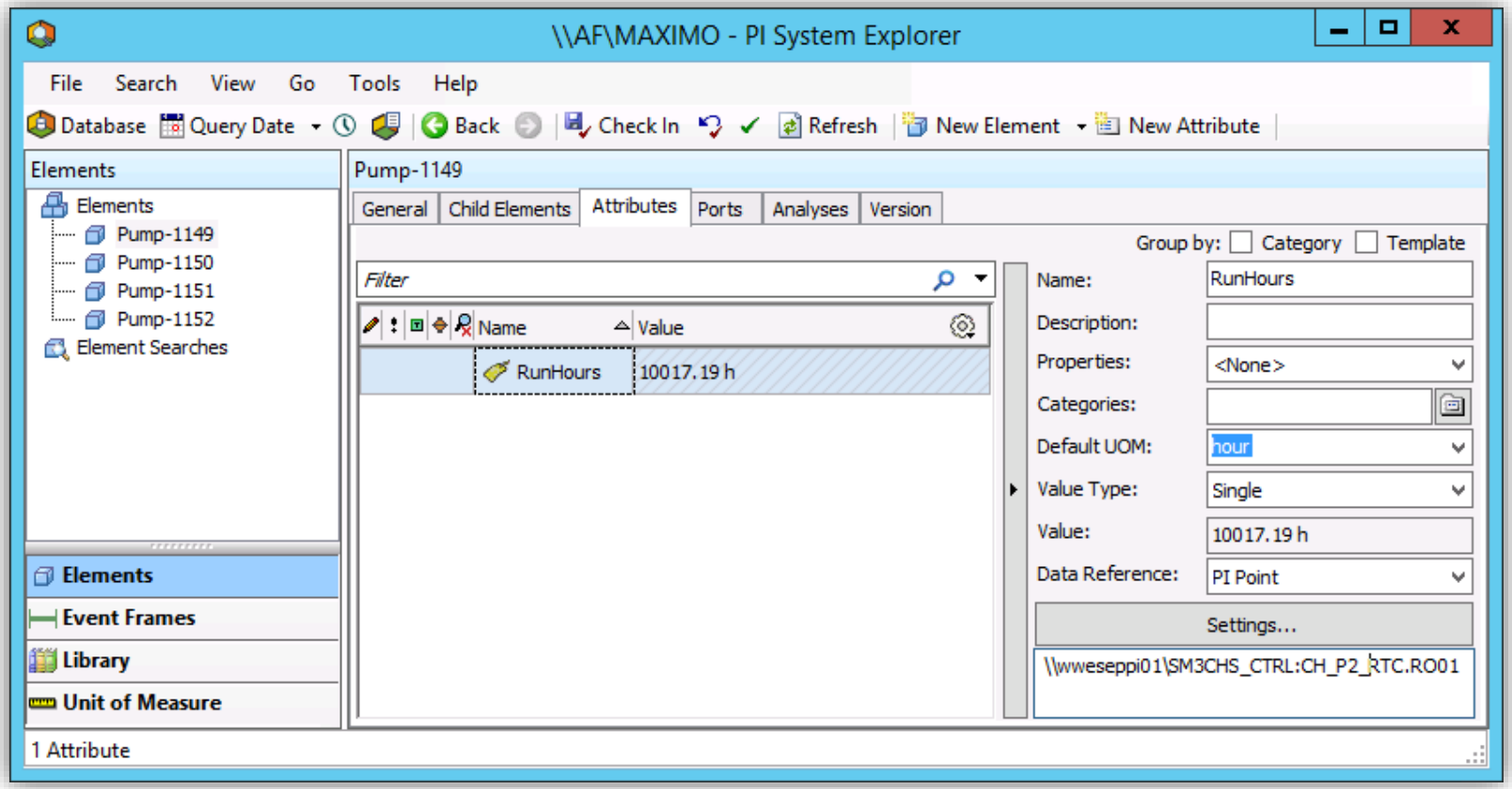
The Pilot: Asset Framework (AF) Side



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The Pilot: Maximo Asset Management Side

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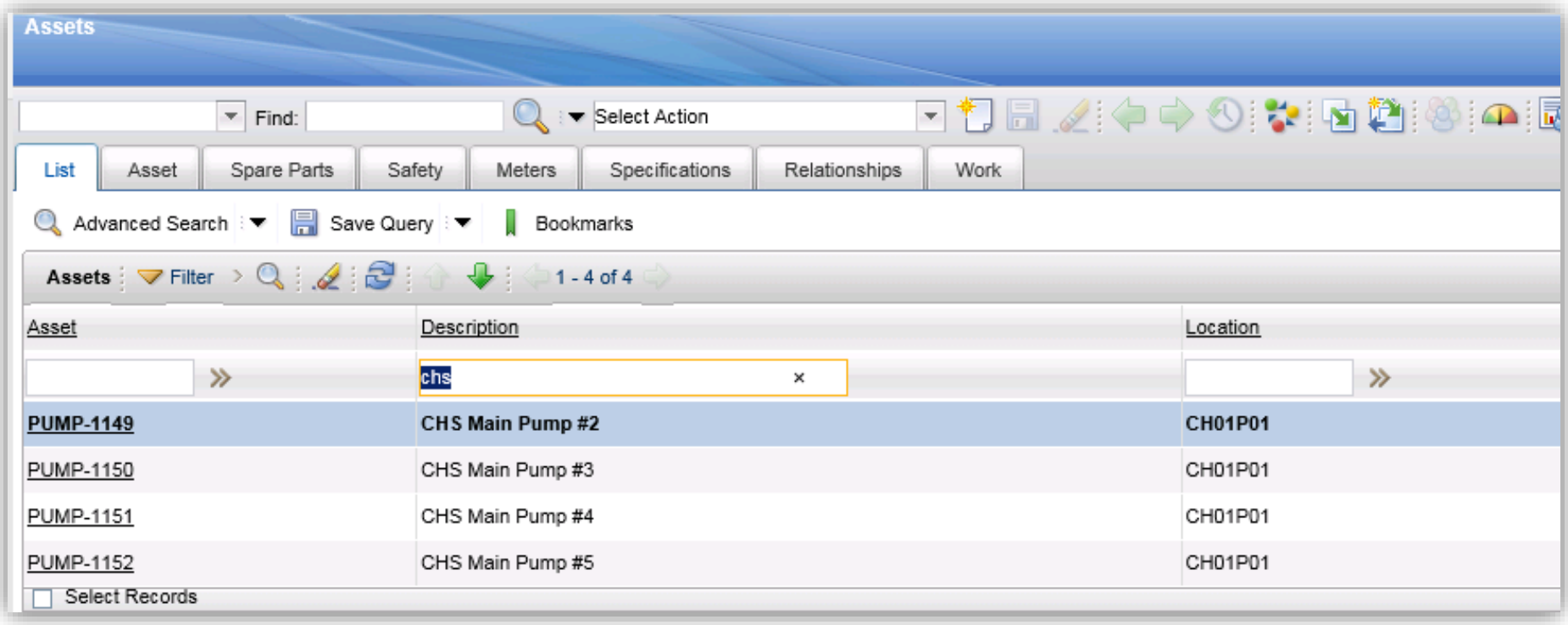

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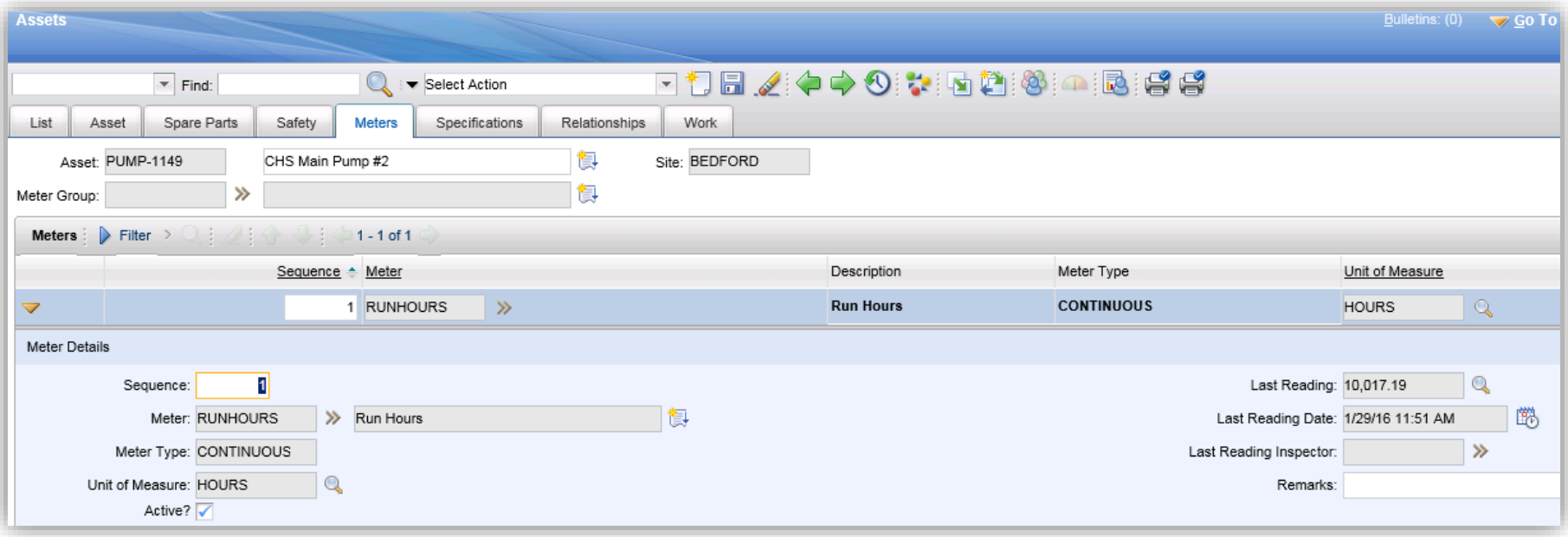
The Pilot: Maximo Asset Management Side



- A RUNHOURS meter is created for each pump

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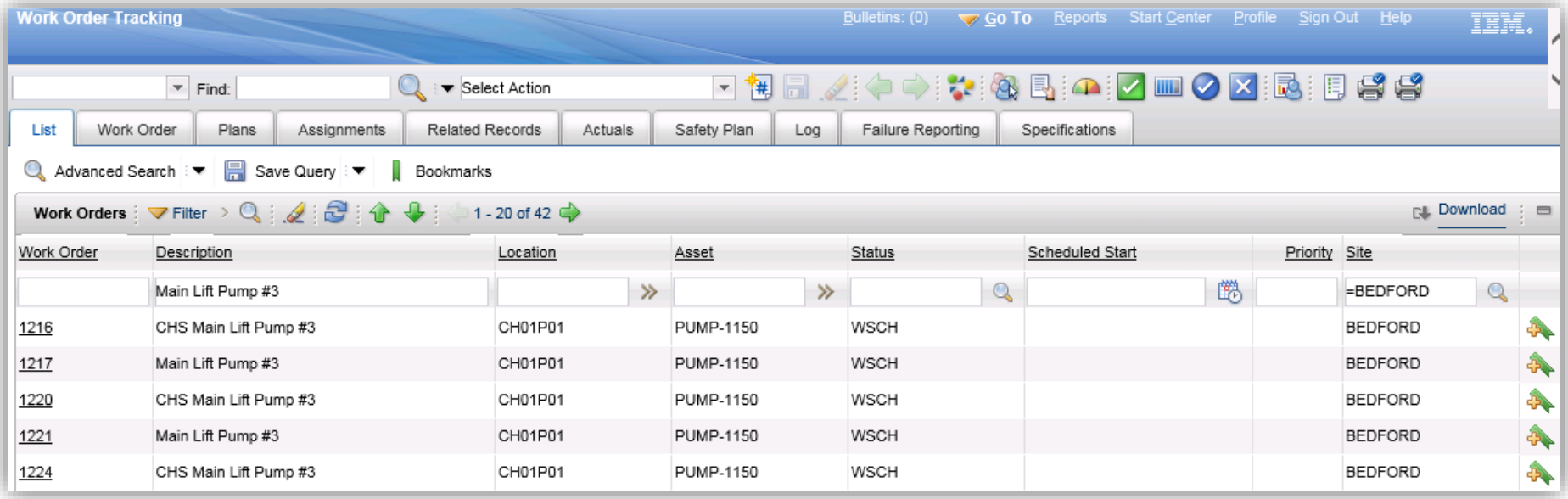
Results of the Pilot



- Fast roll-out compared to other SFPUC projects: Began to automatically generate Maximo work orders 6 weeks after kick-off meeting.

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Results of Pilot

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Asset Name	# of PMs: Scheduled Basis	# of PMs: Conditional Basis	# of unnecessary PMs Avoided
PUMP-1149	28	0	28
PUMP-1150	28	12	16
PUMP-1151	28	0	28
PUMP-1152	28	21	7
Totals	**112**	**33**	**79**

- Over the 28-month simulation, 79 sets of unnecessary monthly Preventative Maintenance procedures were identified.
- Each set of monthly maintenance procedures costs approximately $2100.00
- This equals an annual savings of $71,100.00 for only four assets!

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Pilot Next Steps

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- Connect to SFPUC's Maximo Test Environment
- Meet with Operations and Maintenance: organizational change
- PI-Maximo Data Bridge is ready to work with more assets, no changes needed
- Complete expansion of AF with Maximo Hierarchy
- Connect all DCS RunHour meters to Maximo

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The Future

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- Expand to all assets and all maintenance
  - 100 main pumps = $1,777,500.00 annually
  - This is around 38,000 hours of labor that is available for other work
- Trigger work orders based on other conditions such as temperature or vibration
- Other Maximo-based actions can be performed on PI System data, such as asset replacement forecasts using dashboard with all lifecycle costs and budget data
- Generate all Work Orders automatically; paperless
- Power of Data: Provide the key/critical information to the decision makers.

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Summary

COMPANY and GOAL

The SFPUC Wastewater Asset Management Group wants to implement CBM to optimize asset lifecycles in order to reduce costs

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CHALLENGE

Maximo Asset Management does not aggregate real-time data.

SOLUTION

Create a software utility that extracts data from the PI System and writes it to Maximo

- Leverage out-of-the-box technologies
- AF SDK
- Maximo REST API

RESULTS

A 1/144 scale pilot indicated annual labor savings of $71,100.00 across only four assets

- Translates to 1500+ hours of labor that can be redirected to other work
- Full scale solution promises millions of dollars in savings

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Complete the Online Survey for this session

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감사합니다

谢谢

Danke

Gracias

Merci

Thank You

ありがとう

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Obrigado

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