



# The Visualization Revolution

Presented by **Tom LeBay** and **Eugene Resnick**



# Agenda

- **What's New-** PI Coresight 2015
- **Getting Value-** San Francisco Public Utilities Commission
- **What's Ahead-** Visualization for the modern PI System



- *Web Client for ad hoc analysis*
- *PI System data on any desktop or mobile device*
- *View PI ProcessBook displays*
- *Easily integrated into other web applications*

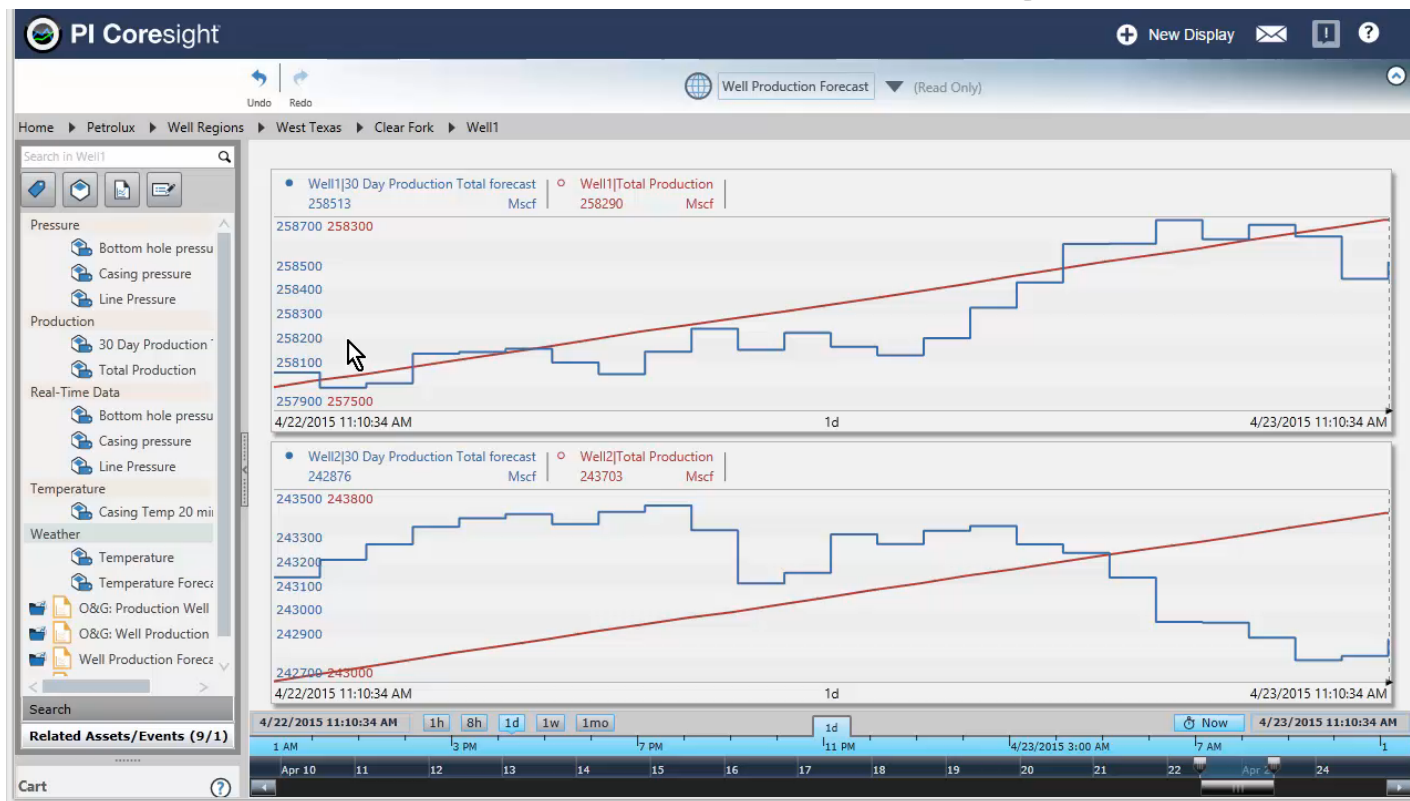


# What's new with PI Coresight 2015

# PI Coresight 2015 supports future data



# I need to see how production is tracking my forecast



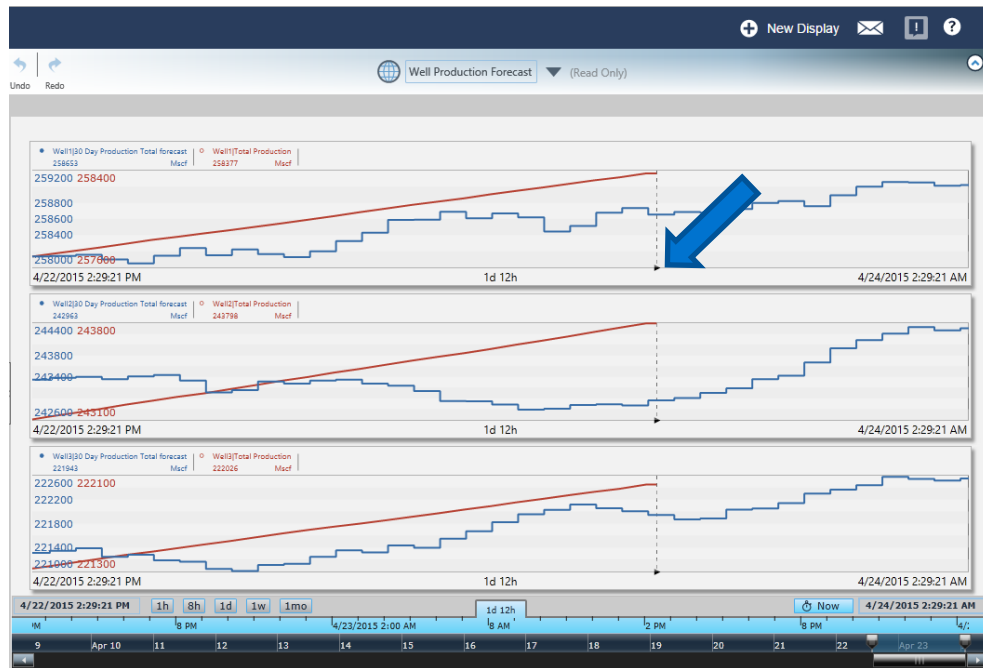
# What did we just do?



1. Current Time indicator



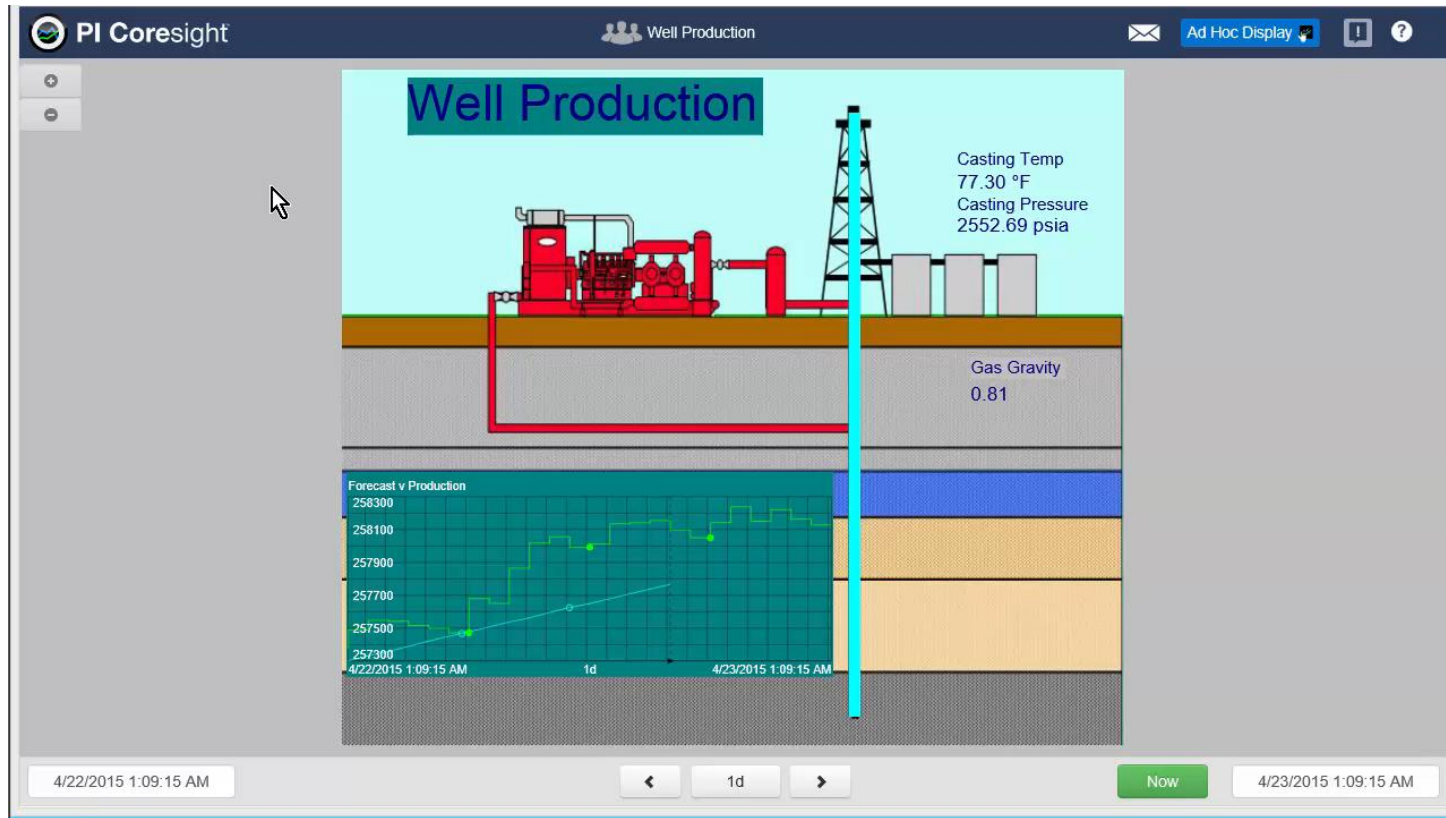
2. Actual vs. Forecast-  
everything updates!




# Sharing is important

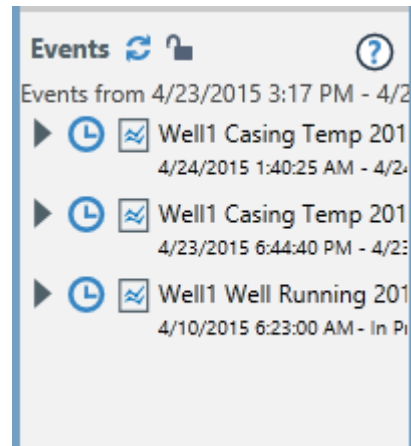
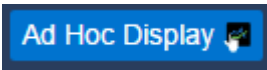


# When I find a problem I need to share it with others



# What did we just do?

- Ad hoc display- all visible data items moved to a table
- Related Events- based on data items and time range
-  • Email link- using local mail client



# Mining for gold



# I want to see specific values on my process displays

The screenshot shows the PI Coresight software interface. At the top, there's a header bar with the PI Coresight logo, a search bar labeled "Search All Displays", and buttons for "New Display", "Help", and "Filter by Labels". Below the header, there's a sidebar on the left with navigation options: "ALL DISPLAYS" (highlighted), "FAVORITES", "MY DISPLAYS", "RECENT", "FOLDER HOME", and "Process Displays". The main area displays a grid of 6 process displays, each with a thumbnail image and a title. The displays are: "Mine Truck3" by OSI/dnardone, "generator" by OSI/lebay, "Coal Mill" by OSI/lebay, "Feedwater System" by OSI/lebay, "Boiler Feedpump Overview" by OSI/lebay, and "WellMain" by OSI/veresnick. Each display thumbnail shows various process data, including graphs, tables, and diagrams. A mouse cursor is visible over the "Mine Truck3" display.

PI Coresight

Search All Displays

Filter by Labels

ALL DISPLAYS

FAVORITES

MY DISPLAYS

RECENT

FOLDER HOME

Process Displays

All Displays (20)

Mine Truck3  
OSI/dnardone

generator  
OSI/lebay

Coal Mill  
OSI/lebay

Feedwater System  
OSI/lebay

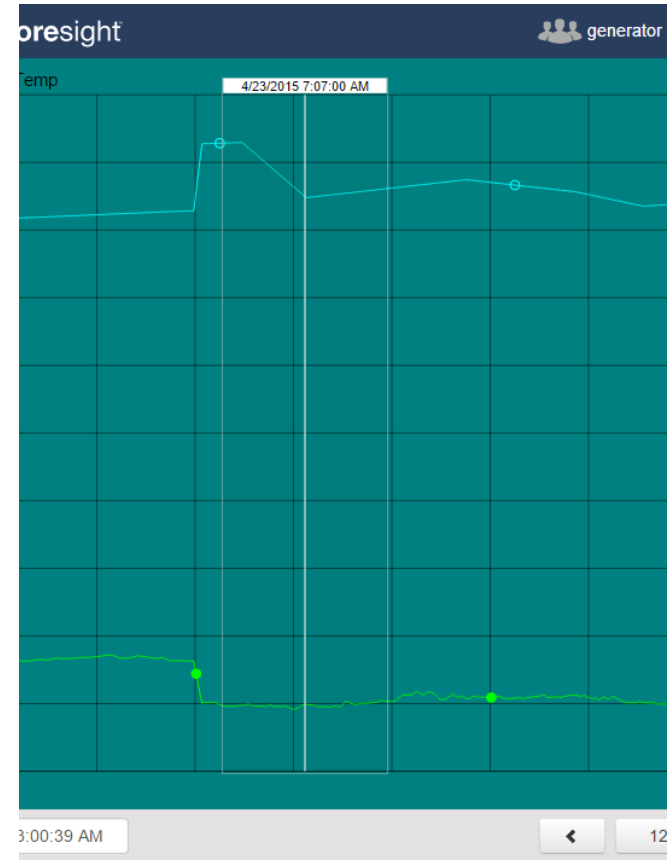
Boiler Feedpump Overview  
OSI/lebay

WellMain  
OSI/veresnick

# What did we just do?



- PI ProcessBook trend cursor
  - Available on pop-up trend
  - Click/tap to place
  - Drag to move or delete



# Show only what's important



# I only want to see what I'm interested in

The screenshot displays the PI System Explorer application window. The title bar reads "\\DFDELOREAN\\PetroLux - PI System Explorer". The menu bar includes File, Search, View, Go, Tools, and Help. Below the menu is a toolbar with icons for Database, Query Date, Check In, Refresh, New Element, and New Attribute. A search bar labeled "Search Elements" is on the right.

The left pane shows a tree view of elements. The "Well1" element is selected under the "West Texas" region. The main pane displays the "Well1" details, with tabs for General, Child Elements, Attributes, Ports, Analyses, and Version. The "General" tab is active, showing a table of data categorized by Location, Power Consumption, Pressure, and Production.

**Well1 Data Table:**

Category	Name	Value
Location	Latitude	31.8633 °
Location	Longitude	102.3656 °
Power Consumption	Power Consumption	80.2914753697307 kW
Pressure	Bottom hole pressure	6916.61010213038 psia
Pressure	Casing pressure	1995.54959954487 psia
Pressure	Line Pressure	1219.67546884887 psia
Pressure	Tubing pressure	1127.37811013468 psia
Production	30 Day Production Total fore...	258141.030334028 Mscf
Production	IP	830 mscfd
Production	P30	21073.7592401507 Mscf
Production	P60	42037.2686356412 Mscf
Production	P90	62993.2170116624 Mscf
Production	P180	125900.79756186 Mscf
Production	Production Rate	716.367483798586 mscfd
Production	Production target	700 mscfd

The right-hand panel shows the "Properties" section for the selected element. It includes fields for Name (Latitude), Description, Properties (Hidden), Categories (Location), Default UOM (degree), Value Type (Double), Value (31.8633 °), and Data Reference (<None>). A "Settings..." button is also present.

At the bottom of the window, a status bar indicates: "Well1 Modified: 4/22/2015 9:22:10 AM. Version: 1/1/1970 12:00:00 AM, Revision 19".

# What did we just do?



- Hidden property

- Not returned by PI Coresight search
- Still returns a value if already on a display



- Excluded property

- Not returned by PI Coresight search
- Does not return a value if already on a display

Group by: ☒ Category

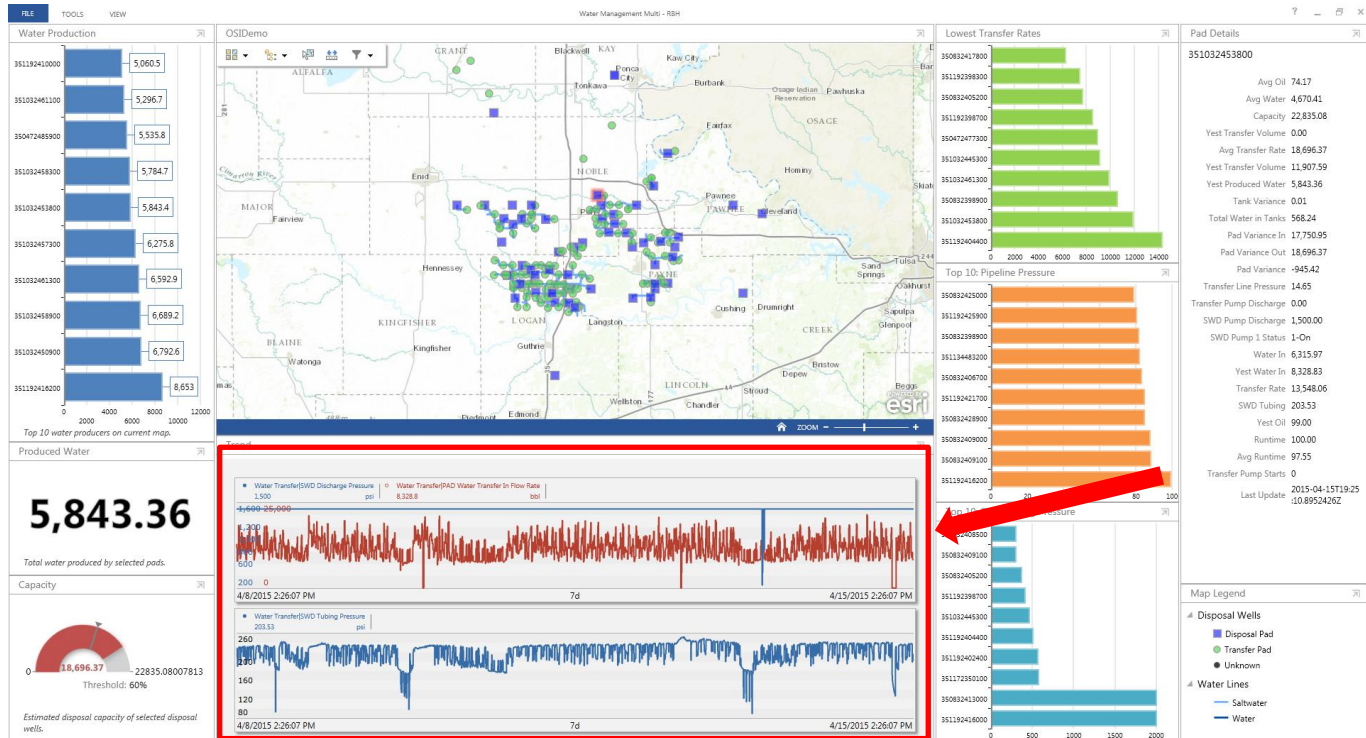
Name:	Production target
Description:	
Properties:	Hidden
Categories:	<input type="checkbox"/> Configuration Item
	<input type="checkbox"/> Excluded
Default UOM:	<input checked="" type="checkbox"/> Hidden
	<input type="checkbox"/> Indexed
Value Type:	
Default Value:	0 mscfd
Data Reference:	<None>

# Some things are better together

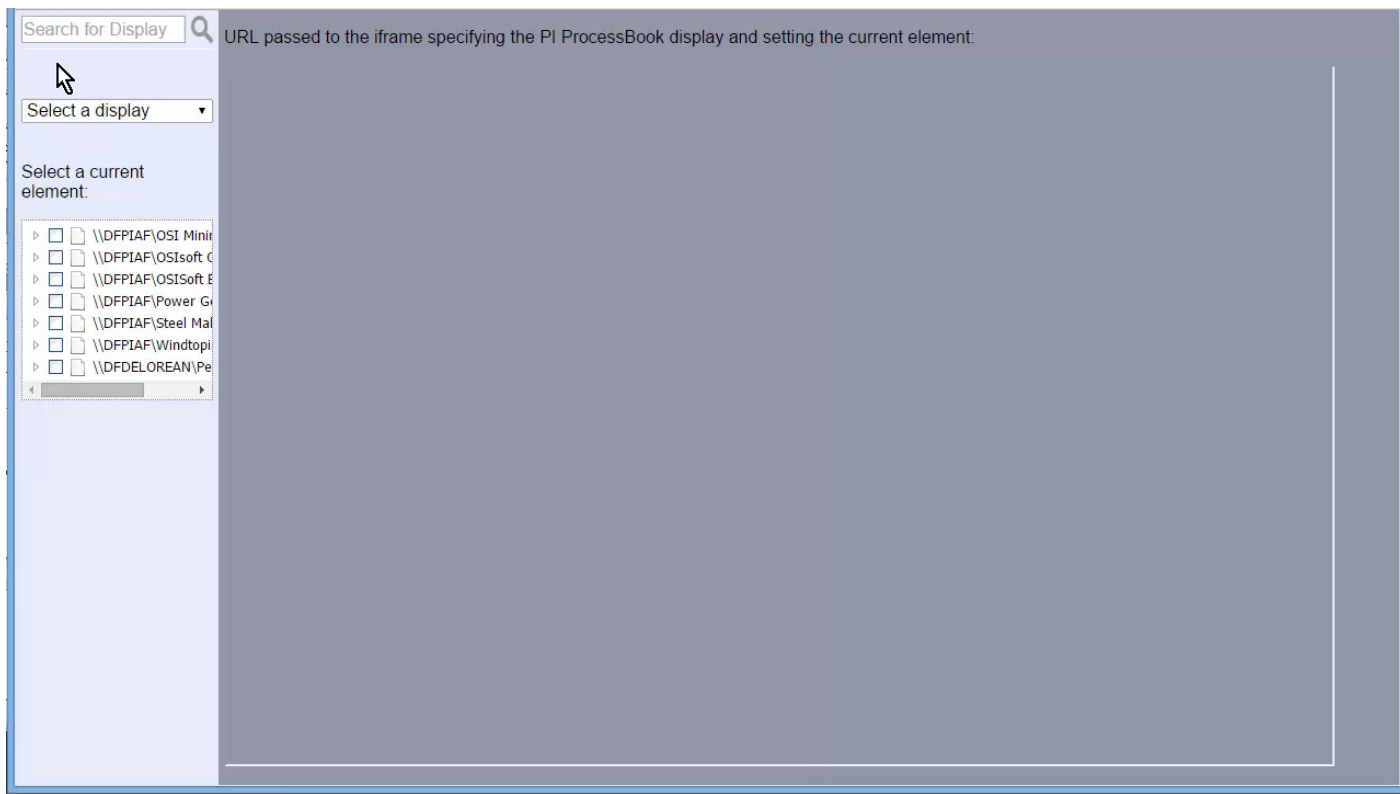


# The power of integration

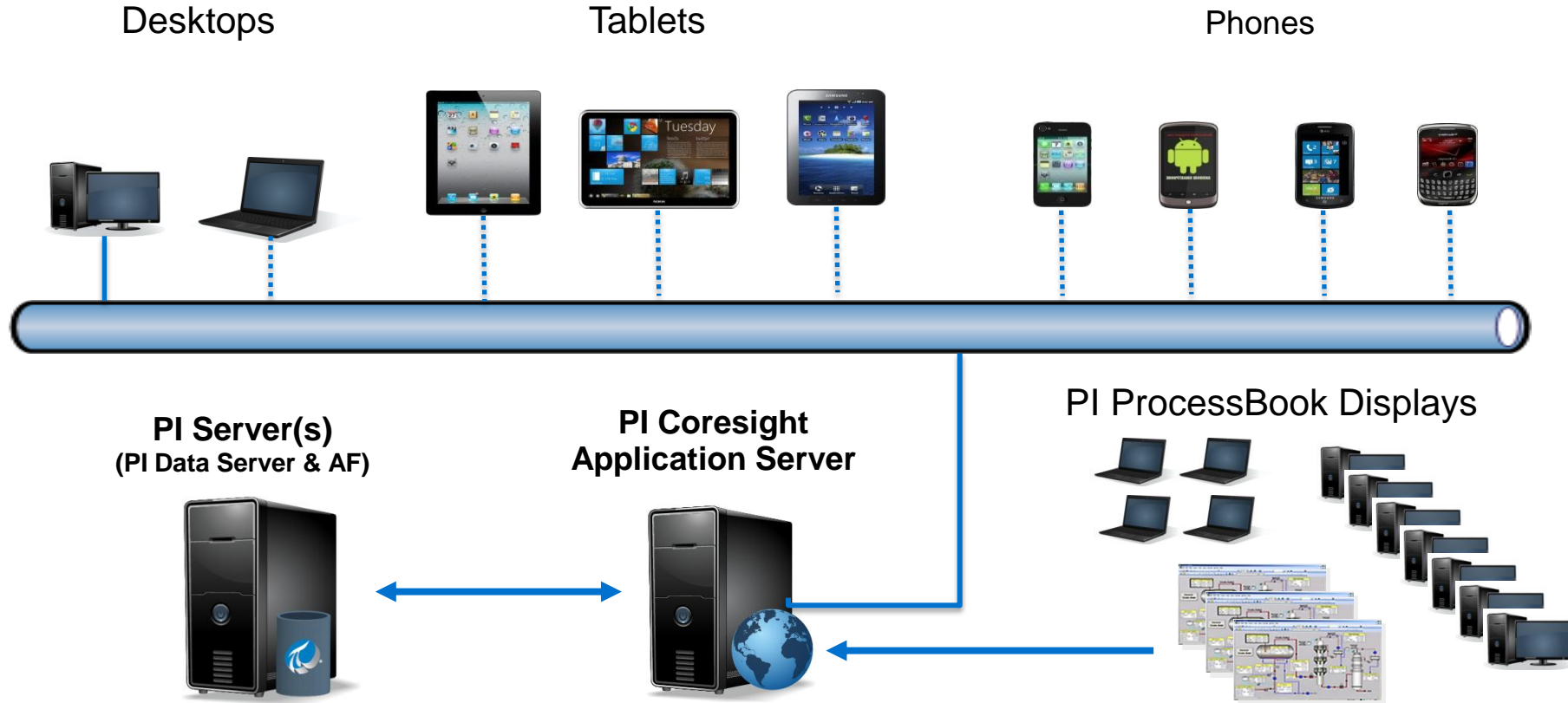
## Operations dashboard at Devon Energy



# Integrate PI Coresight with other web apps



# PI Coresight – Access your data everywhere





San Francisco  
**Water**  
**Power**  
**Sewer**

Services of the San Francisco  
Public Utilities Commission

# Implementation of PI Coresight 2014 at the San Francisco Public Utilities Commission (SFPUC)

Max Chung, Electrical Engineering  
Wastewater Enterprise (WWE)



# Our Background

- The city under The City
  - Wastewater Enterprise (WWE) operates and maintains the City's combined sewer system which collects and cleans both sewage and stormwater.
  - 1,000 miles of pipes
  - 27 pump stations
  - 3 treatment plants
  - 8 deep water outfalls

# How much can we clean?

- Wastewater Enterprise (WWE) has 2 major and 1 standby sewage treatment plants.
  - Southeast plant (SEP) –cleans up to 250 MGD
  - Oceanside plant (OSP) –cleans up to 65 MGD
  - Northpoint plant (NPP) –activated during major rain events, cleans 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

# Old fashioned



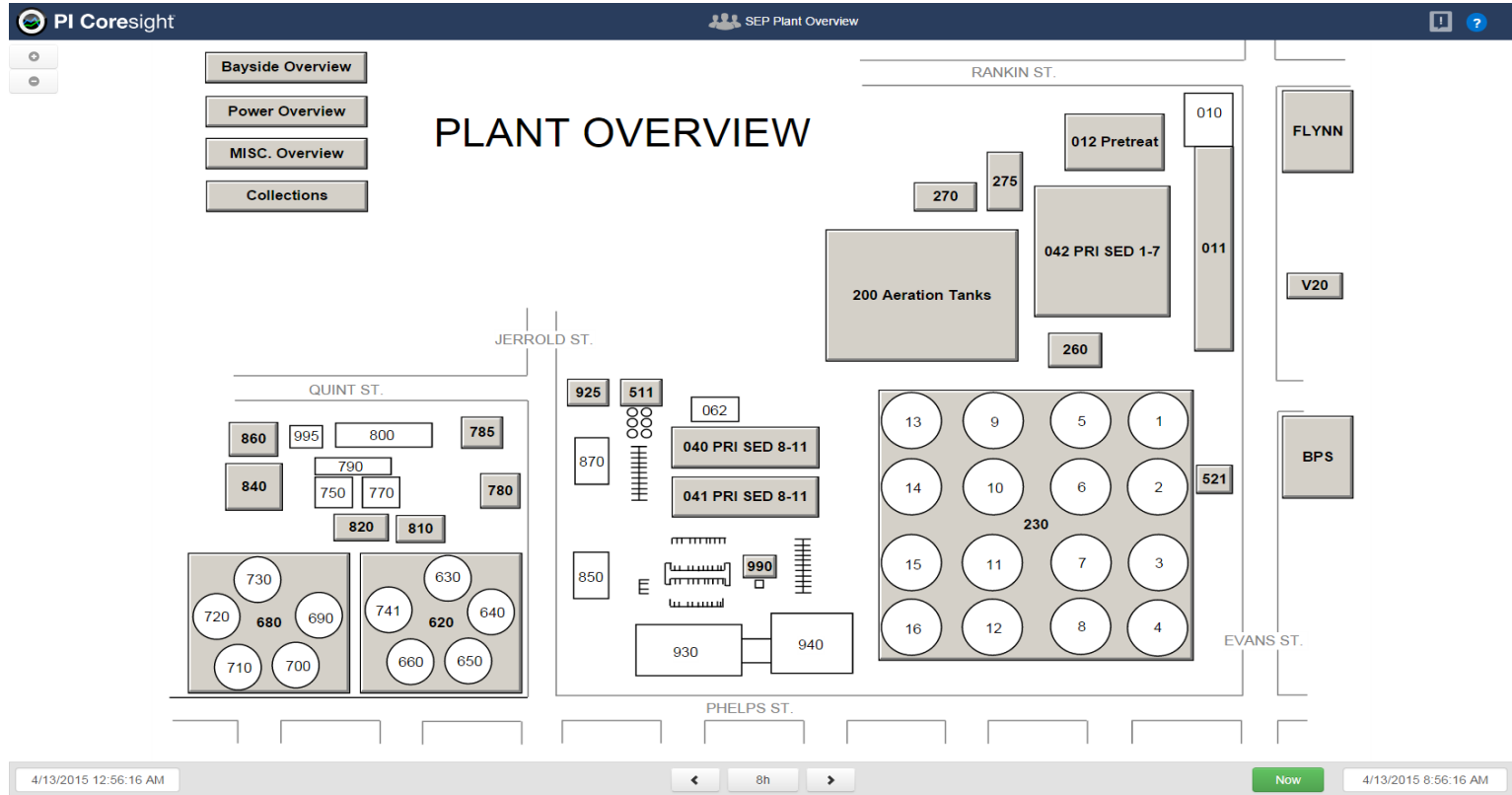
# How we use PI Coresight 2014

The screenshot shows the PI Coresight web application interface. At the top, there's a dark blue header with the PI Coresight logo and a 'New Display' button. Below the header, a search bar and a 'Filter by Labels' link are visible. A sidebar on the left contains a list of display categories: ALL DISPLAYS (selected), FAVORITES, MY DISPLAYS, RECENT, FOLDER HOME, SOUTHEAST PLANT, OCEANSIDE PLANT, TREASURE ISLAND, and SHARED. The main area displays a grid of 12 displays under the heading 'All Displays (300)'. Each display thumbnail includes a title, a brief description, and icons for user access, settings, and favorites. The displays shown are: SEP Plant Overview, Tech Support San Francisco Overview, Pump Runtimes (Mechanical), PIML TEST, ANAMMOX REACTORS, Telog Data, SEA CLIFF 3 PUMP STATION, Bayside Process Overview, SEP TECH SUPPORT, 012A GRIT REMOVAL TEST, 260 OVERVIEW, and 042 040 041 OVERVIEW. The bottom left corner of the interface shows the URL 'pi/Coresight/#/PBDDisplays/1693'.

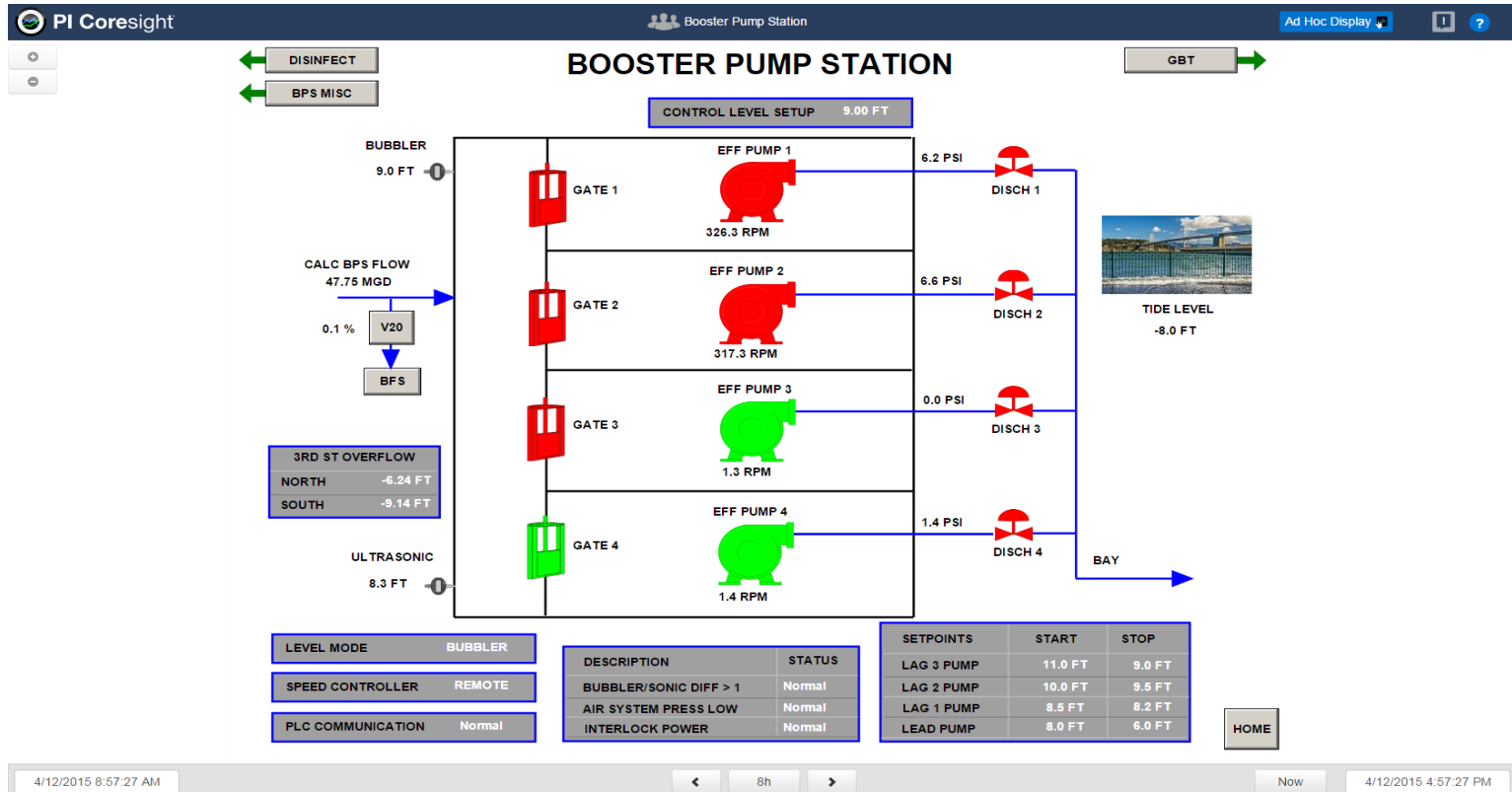
# San Francisco Overview



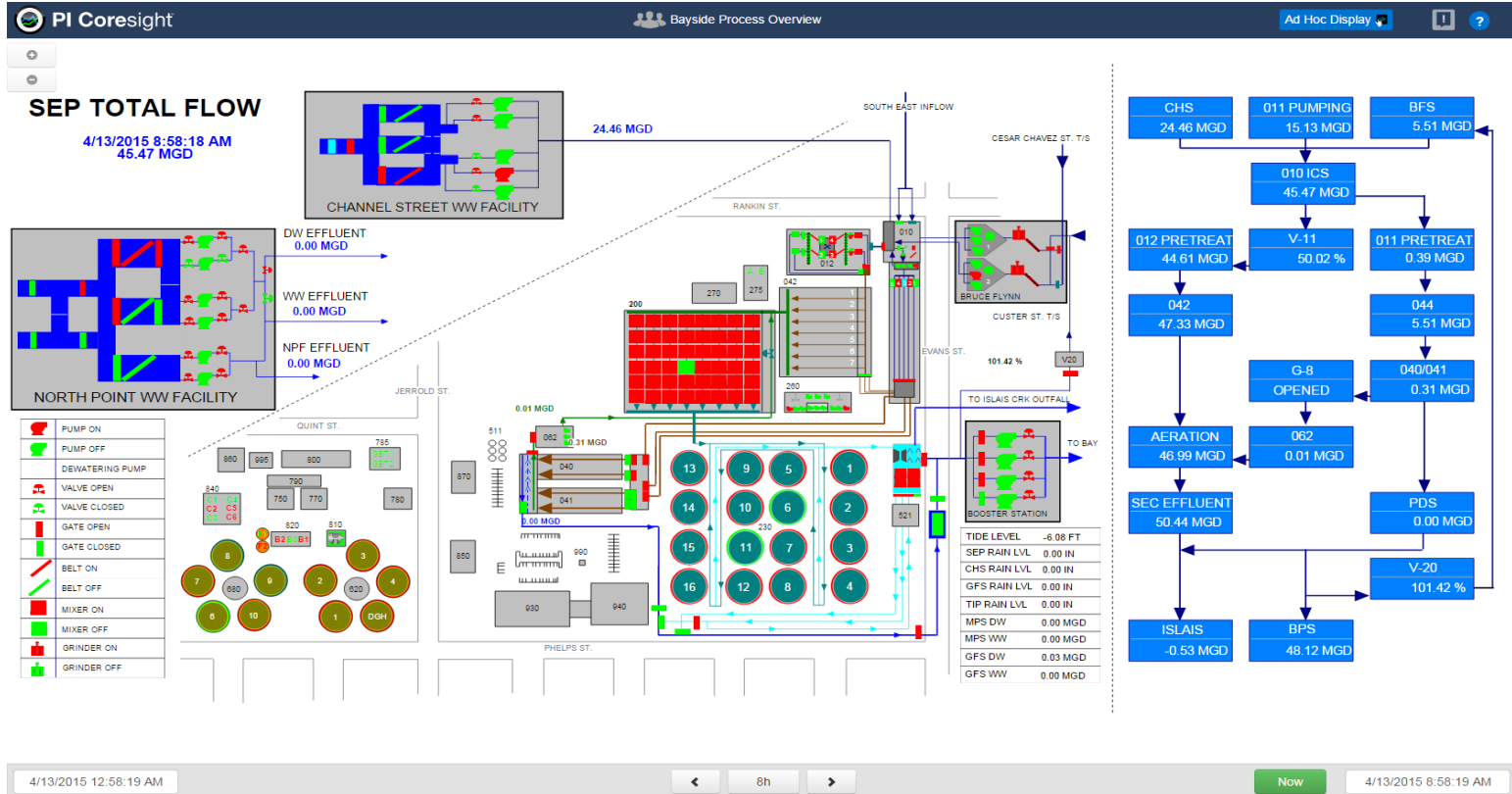
# Southeast Plant Overview



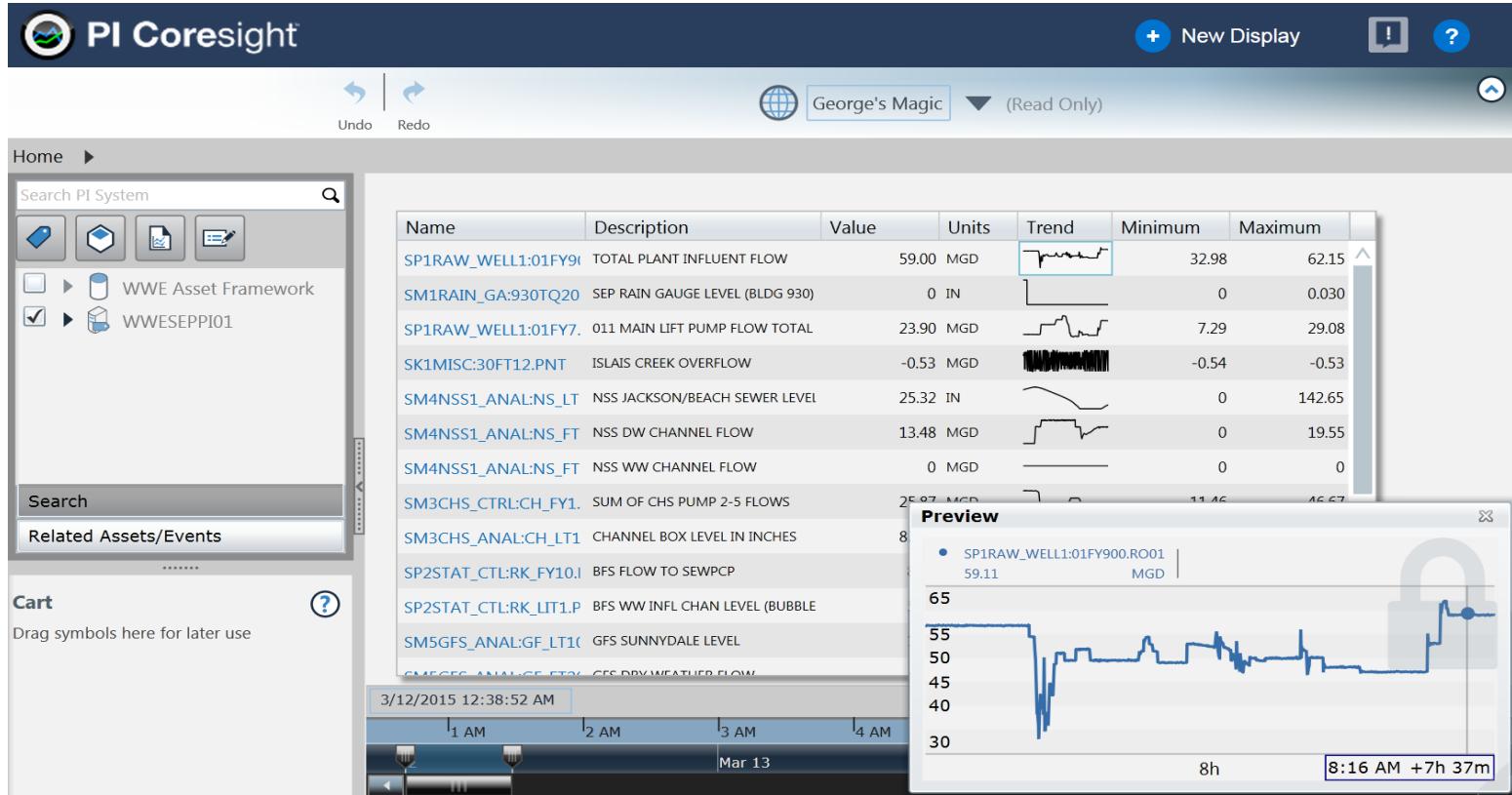
# Booster Pump Station Training



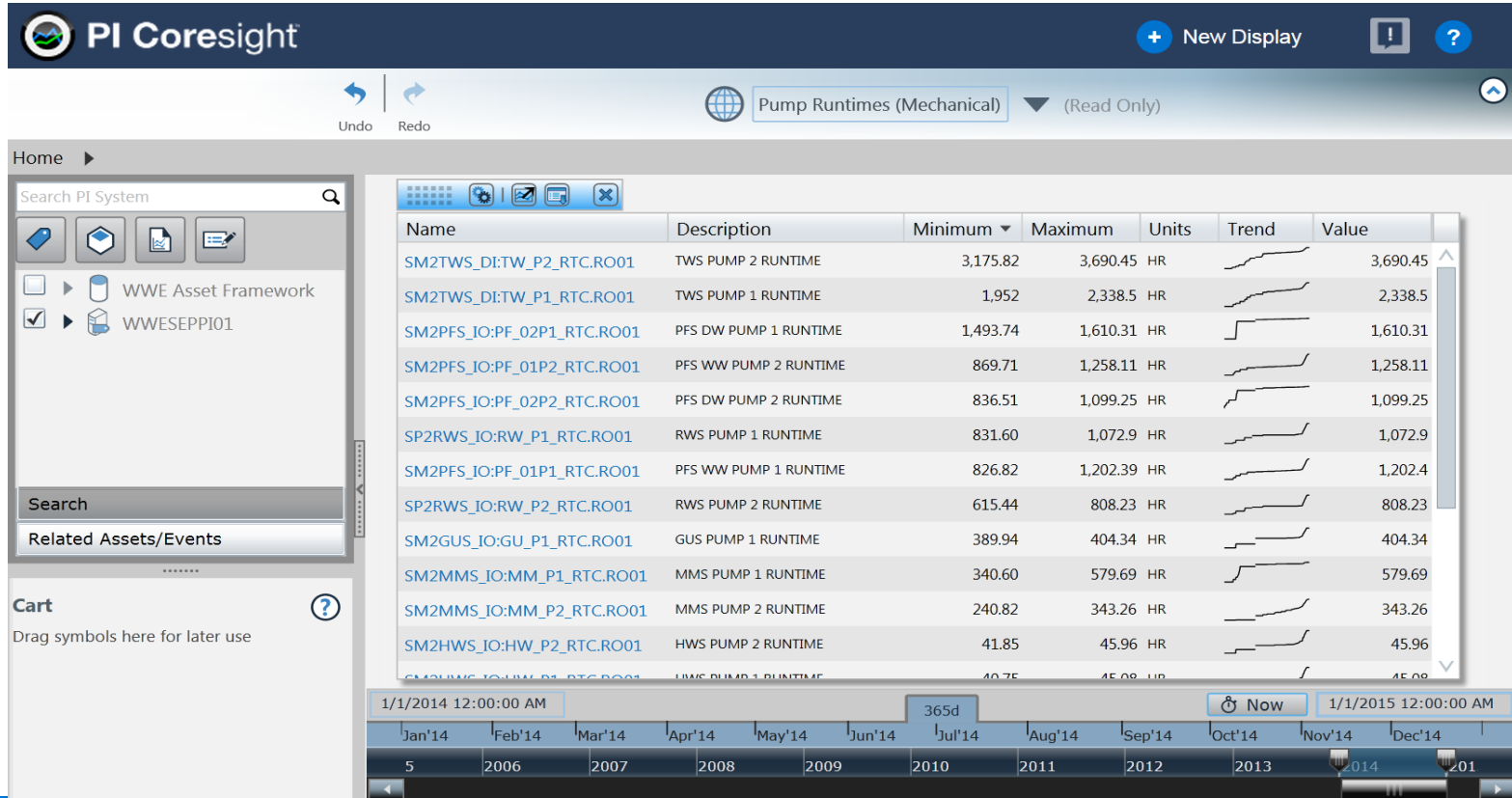
# SEP Process Overview



# Critical Flows and Levels



# Finding Pump Runtimes



The screenshot displays the PI Coresight software interface. At the top, the 'PI Coresight' logo is on the left, and 'New Display' and help icons are on the right. Below the header, there are 'Undo' and 'Redo' buttons, a globe icon, and a dropdown menu set to 'Pump Runtimes (Mechanical)' with '(Read Only)' status. The main content area is divided into three sections: a left sidebar, a central table, and a bottom timeline.

**Left Sidebar:**

- Search PI System (with a magnifying glass icon)
- Icons for various asset types (tag, folder, document, etc.)
- Assets: WWE Asset Framework (unchecked) and WWESEPI01 (checked)
- Search button
- Related Assets/Events section
- Cart section with a question mark icon and the text 'Drag symbols here for later use'

**Central Table:**

Name	Description	Minimum	Maximum	Units	Trend	Value
SM2TWS_DI:TW_P2_RTC.RO01	TWS PUMP 2 RUNTIME	3,175.82	3,690.45	HR		3,690.45
SM2TWS_DI:TW_P1_RTC.RO01	TWS PUMP 1 RUNTIME	1,952	2,338.5	HR		2,338.5
SM2PFS_IO:PF_02P1_RTC.RO01	PFS DW PUMP 1 RUNTIME	1,493.74	1,610.31	HR		1,610.31
SM2PFS_IO:PF_01P2_RTC.RO01	PFS WW PUMP 2 RUNTIME	869.71	1,258.11	HR		1,258.11
SM2PFS_IO:PF_02P2_RTC.RO01	PFS DW PUMP 2 RUNTIME	836.51	1,099.25	HR		1,099.25
SP2RWS_IO:RW_P1_RTC.RO01	RWS PUMP 1 RUNTIME	831.60	1,072.9	HR		1,072.9
SM2PFS_IO:PF_01P1_RTC.RO01	PFS WW PUMP 1 RUNTIME	826.82	1,202.39	HR		1,202.4
SP2RWS_IO:RW_P2_RTC.RO01	RWS PUMP 2 RUNTIME	615.44	808.23	HR		808.23
SM2GUS_IO:GU_P1_RTC.RO01	GUS PUMP 1 RUNTIME	389.94	404.34	HR		404.34
SM2MMS_IO:MM_P1_RTC.RO01	MMS PUMP 1 RUNTIME	340.60	579.69	HR		579.69
SM2MMS_IO:MM_P2_RTC.RO01	MMS PUMP 2 RUNTIME	240.82	343.26	HR		343.26
SM2HWS_IO:HW_P2_RTC.RO01	HWS PUMP 2 RUNTIME	41.85	45.96	HR		45.96
SM2HWS_IO:HW_P1_RTC.RO01	HWS PUMP 1 RUNTIME	40.75	45.08	HR		45.08

**Bottom Timeline:**

The timeline shows a date range from 1/1/2014 12:00:00 AM to 1/1/2015 12:00:00 AM. A 'Now' button is present. The timeline is divided into months (Jan'14 to Dec'14) and years (2006 to 2014). A '365d' label indicates the current view range.



# One Other PI Coresight Integration



Site Actions | Browse | Page | Max Chung

San Francisco Water Power Sewer Engineering | Home


Share | Engineering | Coresight | PI Documentation | Search this site...

Sites  
Libraries  
Site Pages  
Shared Documents  
Drawings  
Lists  
Facility Codes  
Unit Processes  
Calendar  
Tasks  
Discussions  
Team Discussion  
Recycle Bin  
All Site Content

## WWE Engineering

The purpose of the Engineering Division is to serve the people of San Francisco by providing engineering services to the SFPUC Wastewater Enterprise (WWE), to allow WWE to maintain and improve the efficiency and reliability of wastewater collection and treatment in a way that ensures the public's safety and welfare. Specifically, the engineering services provided are for research, planning, design, construction, start-up and troubleshooting of the wastewater facilities.

The staff also provides engineering document creation, revision, research, and archiving for all sections of WWE and for other City agencies; performs field investigations and locating of WWE utilities and facilities, locates and marks WWE facilities in the public right of way, and manages office and field equipment.



### Shared Documents

Type	Name	Modified	Modified By
	HVAC and Plumbing Equipment List Dwg Set	3/17/2015 1:53 PM	Ellen Butawan

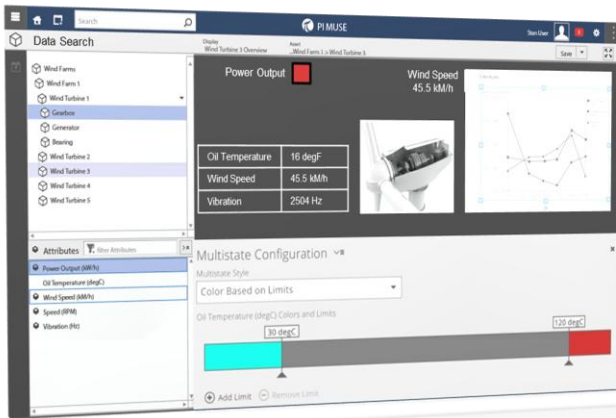
[Add document](#)



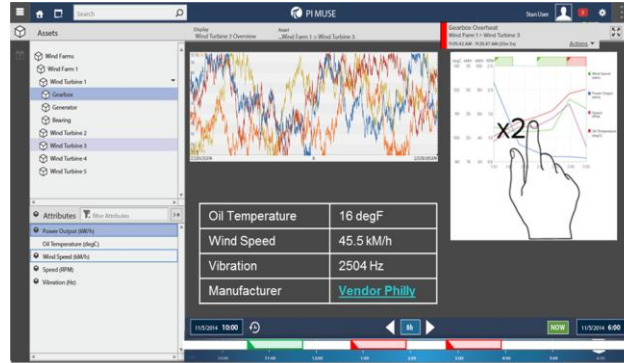
# What's planned for PI Coresight?



# Visualization for today's PI System



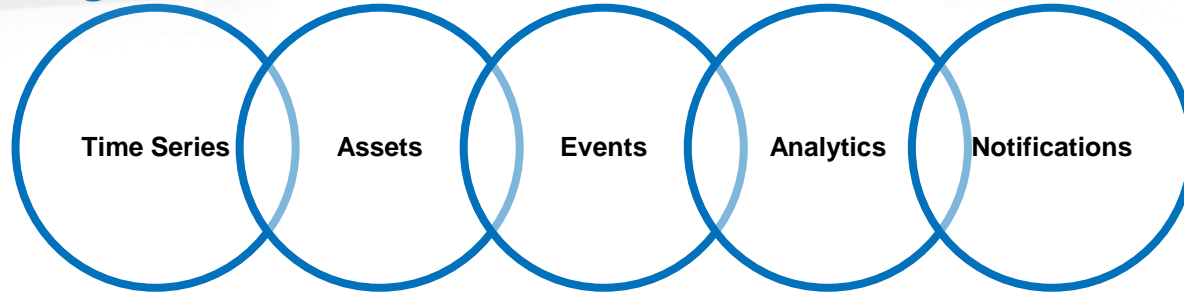
Authoring



Monitoring



Ad Hoc Analysis



# TODAY (2015)

PI ProcessBook

Display Editor  
Process Monitoring



 **PI Coresight™ 2.x**

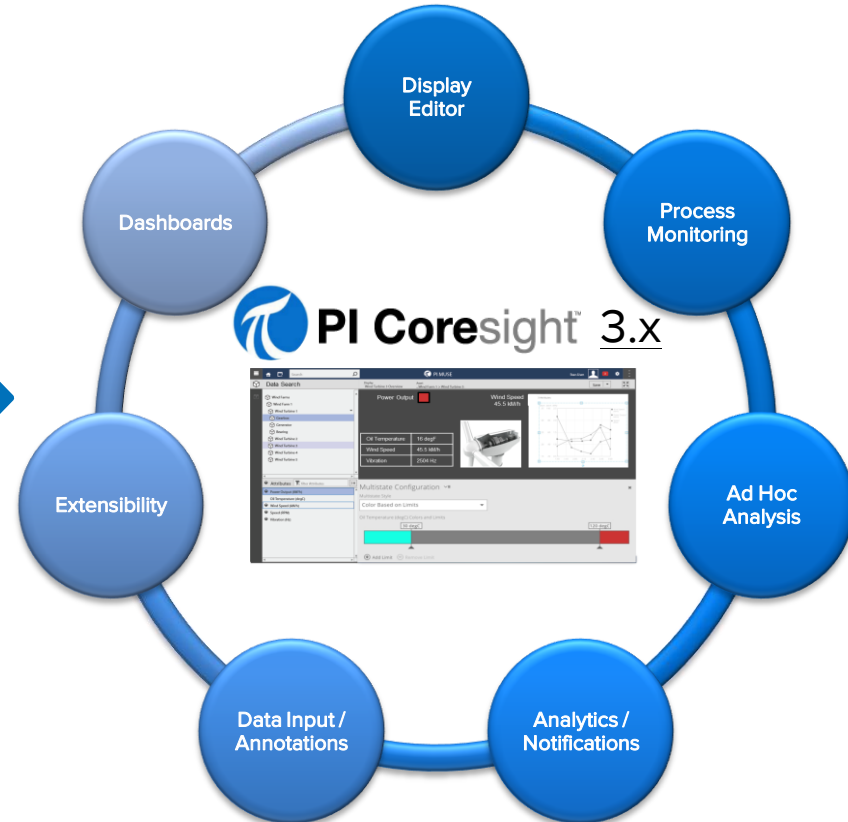
Ad Hoc Analysis  
PB Display Viewer



PI WebParts

Dashboards

# FUTURE (2016+)



# **PI Coresight™ 3.x**

The following is a glimpse of what the development team is working on in support of the PI Coresight 3.x vision.

The functionality displayed is subject to change.

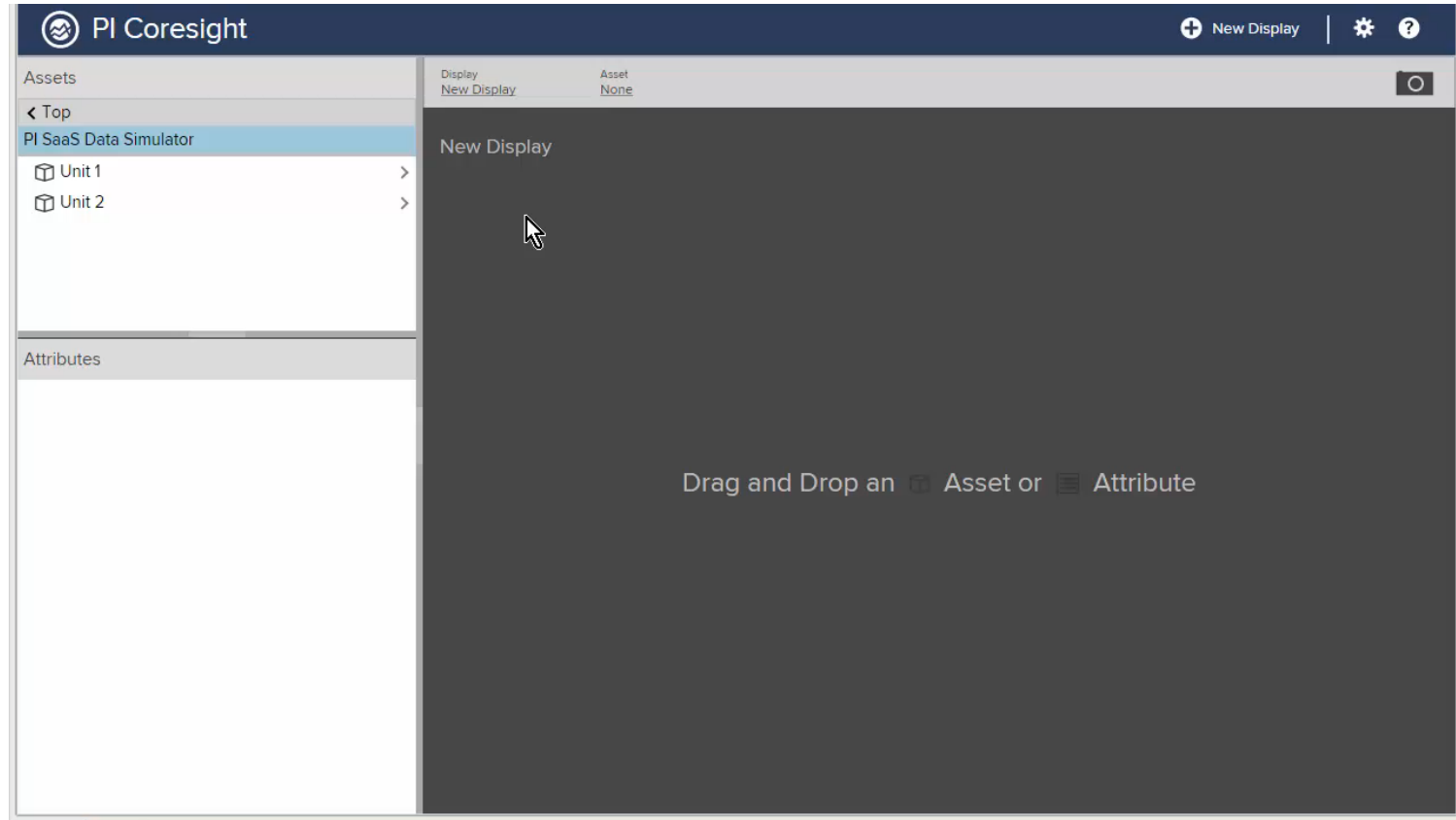
In other words... anything you are about to see or hear can't be held against Tom or Eugene in a court of law.



# Keep it simple...and make it look good



# Draw me a picture



# High priority interrupt



# What's important right now?



Prototype  
Development

NotificationsOptions

Show: AllOrder by: Start Time

Overheat\_3/30/2015 1:00:00 PM  
in BoilerB-1 (Critical)Acknowledged

Downtime\_3/30/2015 3:00:00 PM  
in BoilerA-2 (Low)Acknowledged

Downtime\_4/22/2015 1:00:00 AM  
in BoilerA-1 (Medium)Acknowledged

Downtime\_4/22/2015 10:00:00 AM  
in Turbine3C (Medium)Acknowledged

Overheat\_4/22/2015 1:00:00 PM  
in BoilerB-1 (Critical)Acknowledged

Downtime\_4/22/2015 3:00:00 PM  
in BoilerA-2 (Medium)Acknowledged

Downtime\_4/23/2015 1:00:00 AM  
in BoilerA-1 (Medium)Acknowledged

Overheat\_4/23/2015 6:00:00 AM  
in Turbine3C (Critical)Acknowledged

Low Flow\_4/23/2015 8:00:00 AM  
in Pump117 (Critical)Acknowledged

: to inAcknowledged

Analysis rule	Evaluation result	Input triggers	Value	Units of measure
Analysis rule shown here	29837	Pressure	56	psi
		Flow rate	76	GPM
		Level	81	in.
		Temperature	87	C
Material	Dimethyl sulfoxide	---	Dimethyl sulfoxide	---

Link to asset:

Event Attribute	Event Attribute Value
-----------------	-----------------------

Primary Reference Element:

Add commentAdd reason code

comment goes here

AddUpload file

Comment History

Acknowledge

Other Actions

☐ Sed ut perspiciatis unde omnis

☐ Sed ut perspiciatis unde omnis

☐ Sed ut perspiciatis unde omnis

# Time is relative



# What's different about what just happened?



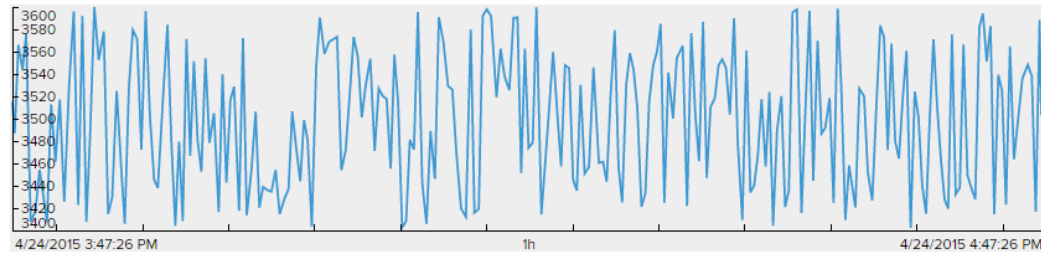
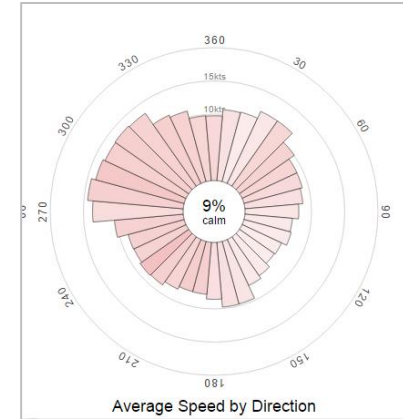
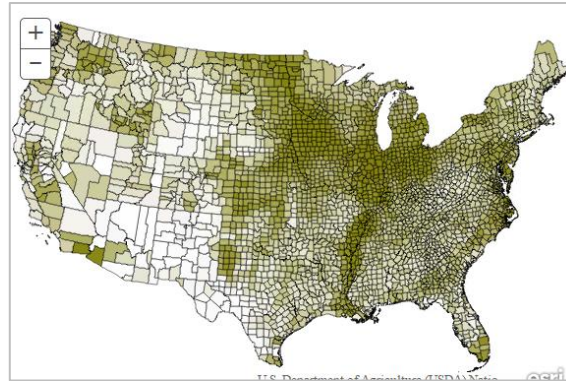
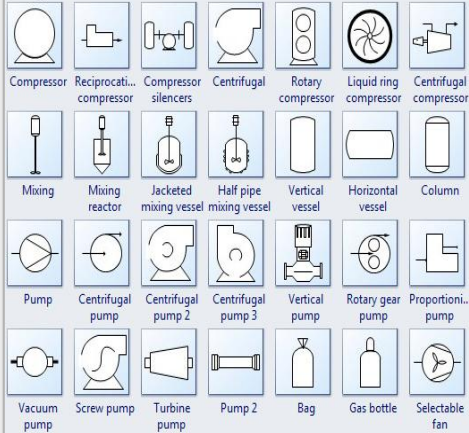
# More is better



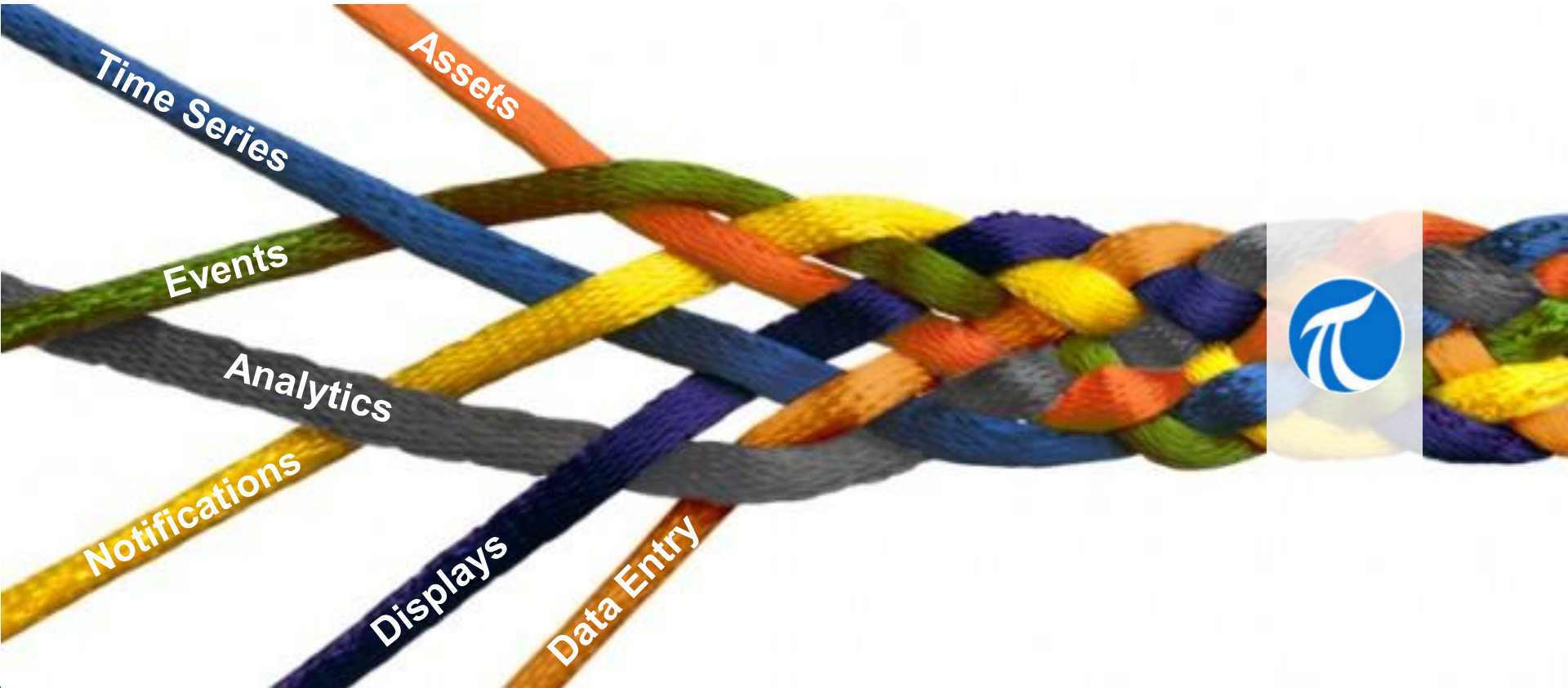


## Petrolux Library

### Equipments



# The PI System delivers even more value when integrated together



# For more information

## Today

Batch Migration to Event Frames	2:00 - 2:30
Event Frames - How to Provide Context to Critical Events	2:45 - 3:15
Building Displays with the new PI ProcessBook and PI Coresight	2:00 - 3:15 Lab

## Tomorrow

Exploring your Data with PI Coresight	9:15 - 10:30 Lab
Bring element-relative features of your PI ProcessBook displays to PI Coresight	9:15 - 12:00 Lab



## Tom LeBay

Product Manager

OSIsoft, LLC

## Eugene Resnick

Engineering Group Lead

OSIsoft, LLC

## Max Chung

Electrical Engineer

Wastewater Enterprise (WWE)



# Questions

Please wait for the  
**microphone** before asking  
your questions

State your  
**name & company**





# THANK YOU

Brought to you by  **OSIsoft.**