



# The Visualization Revolution

Presented by René Thomassen and Tom LeBay



# 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

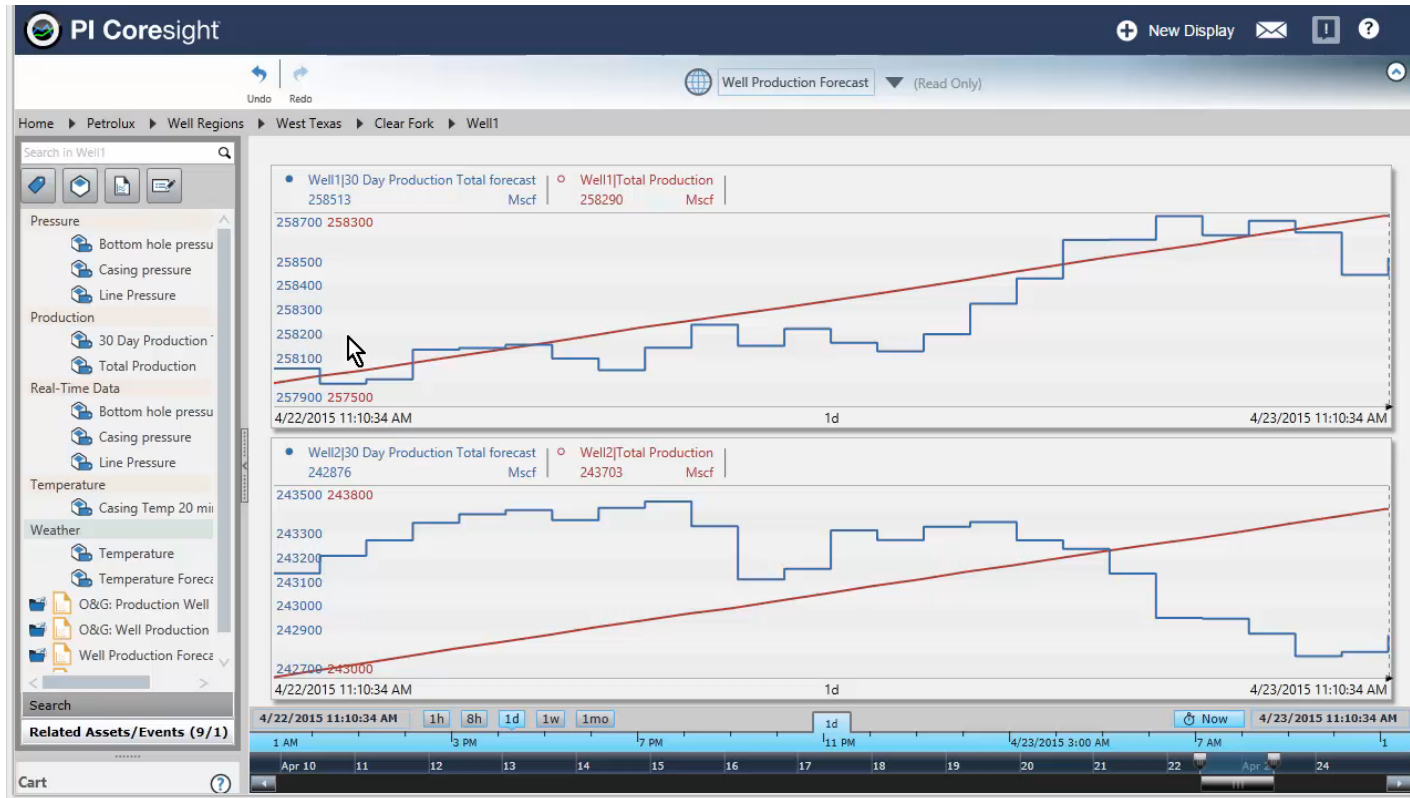


# What's new with PI Coresight 2015



# PI Coresight 2015 supports future data

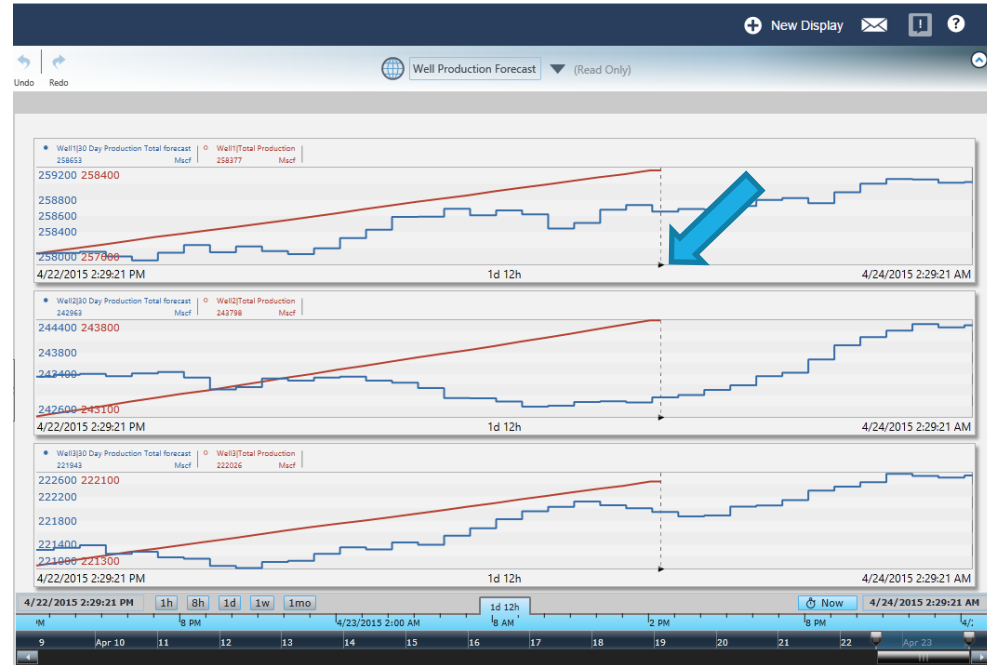


# I need to see how production is tracking my forecast



# What did we just do?

-  1. Current Time indicator
-  2. Actual vs. Forecast-everything updates!

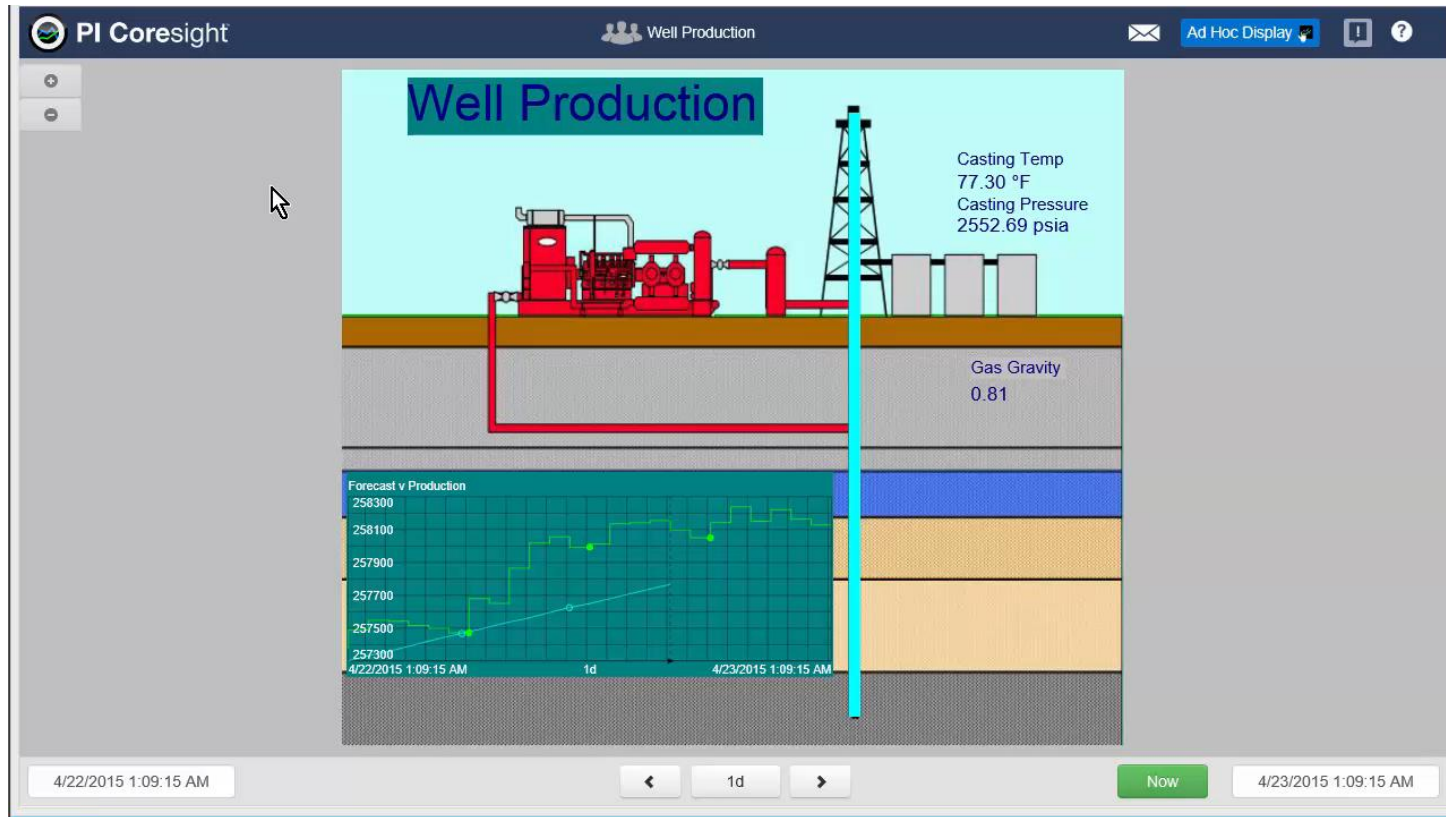





# Sharing is important







# 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

Ad Hoc Display 

**Events**   

Events from 4/23/2015 3:17 PM - 4/24/2015 1:40:25 AM - 4/24/2015 6:44:40 PM - 4/25/2015 6:23:00 AM - In Progress

- ▶   Well1 Casing Temp 201  
4/24/2015 1:40:25 AM - 4/24/2015 6:44:40 PM
- ▶   Well1 Casing Temp 201  
4/23/2015 6:44:40 PM - 4/24/2015 6:23:00 AM
- ▶   Well1 Well Running 201  
4/10/2015 6:23:00 AM - In Progress



# 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 with the PI Coresight logo and a 'New Display' button. Below the header is a search bar labeled 'Search All Displays' and a 'Filter by Labels' link. On the left side, there's a sidebar with navigation links: 'ALL DISPLAYS' (highlighted), 'FAVORITES', 'MY DISPLAYS', 'RECENT', 'FOLDER HOME', and 'Process Displays'. The main area displays a grid of 20 process displays. Each display has a title, a thumbnail image, and a set of icons (people, gear, star) at the bottom. The displays shown are: 'Mine Truck3' (OSI/dnardone), 'generator' (OSI/lebay), 'Coal Mill' (OSI/lebay), 'Feedwater System' (OSI/lebay), 'Boiler Feedpump Overview' (OSI/lebay), and 'WellMain' (OSI/veresnick). The 'Coal Mill' display shows a table of values for various parameters like 'Coal Mill KPIs' and 'Coal Flow, Speed, Load'. The 'Feedwater System' display shows a schematic diagram of the system. The 'Boiler Feedpump Overview' display shows a schematic diagram of the pump system. The 'WellMain' display shows a line graph of a process variable over time.

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

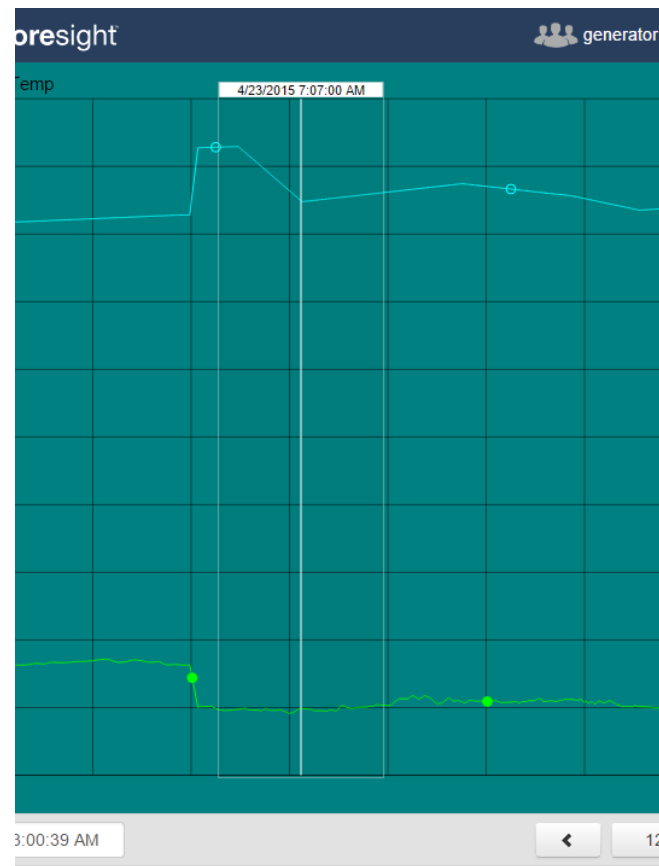
Boiler Feedpump Overview  
OSI/lebay

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

\\DFDELOREAN\Petrolux - PI System Explorer

File Search View Go Tools Help

Database Query Date Back Refresh New Element New Attribute Search Elements

Elements

- Elements
  - Asset Lists
  - Drill Rigs
  - Drilling Companies
  - Key Performance Indicators
  - PetroLux Corporation
  - P1 System Server
  - PI Server
  - Reactors
  - Triggers
  - Well Regions
    - West Texas
      - Clear Fork
        - Well1
        - Well2
        - Well3
        - Well4
      - Odessa
  - Element Searches

Well1

General Child Elements Attributes Ports Analyses Version

Filter

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

Group by: ☒ Category ☐ Template

Name: Latitude

Description:

Properties: Hidden

Categories: Location

Default UOM: degree

Value Type: Double

Value: 31.8633 °

Data Reference: <None>

Settings...

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

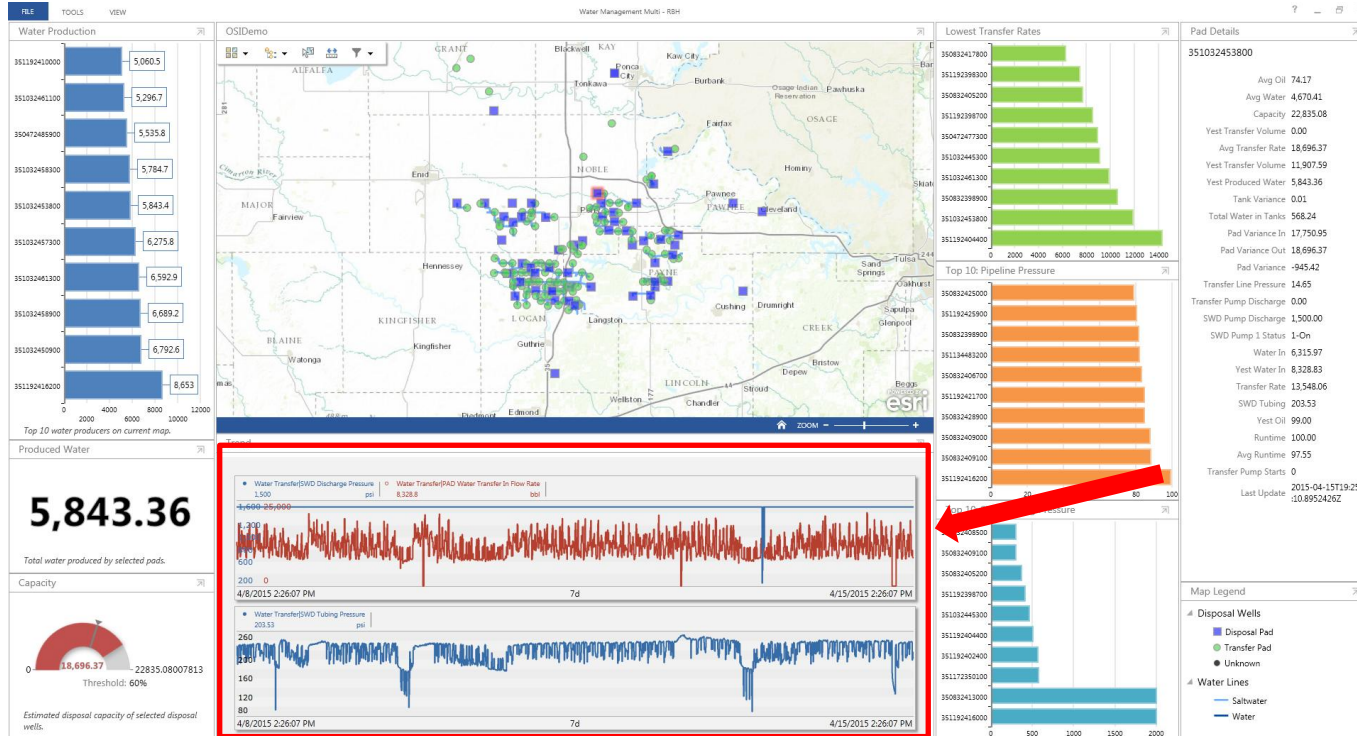
Name:	Production target
Description:	
Properties:	Hidden
Categories:	<input type="checkbox"/> Configuration Item
	<input type="checkbox"/> Excluded
Default UOM:	<input checked="" type="checkbox"/> Hidden
	<input type="checkbox"/> Indexed
Value Type:	
Default Value:	0 mscfd
Data Reference:	<None>

# Some things are better together

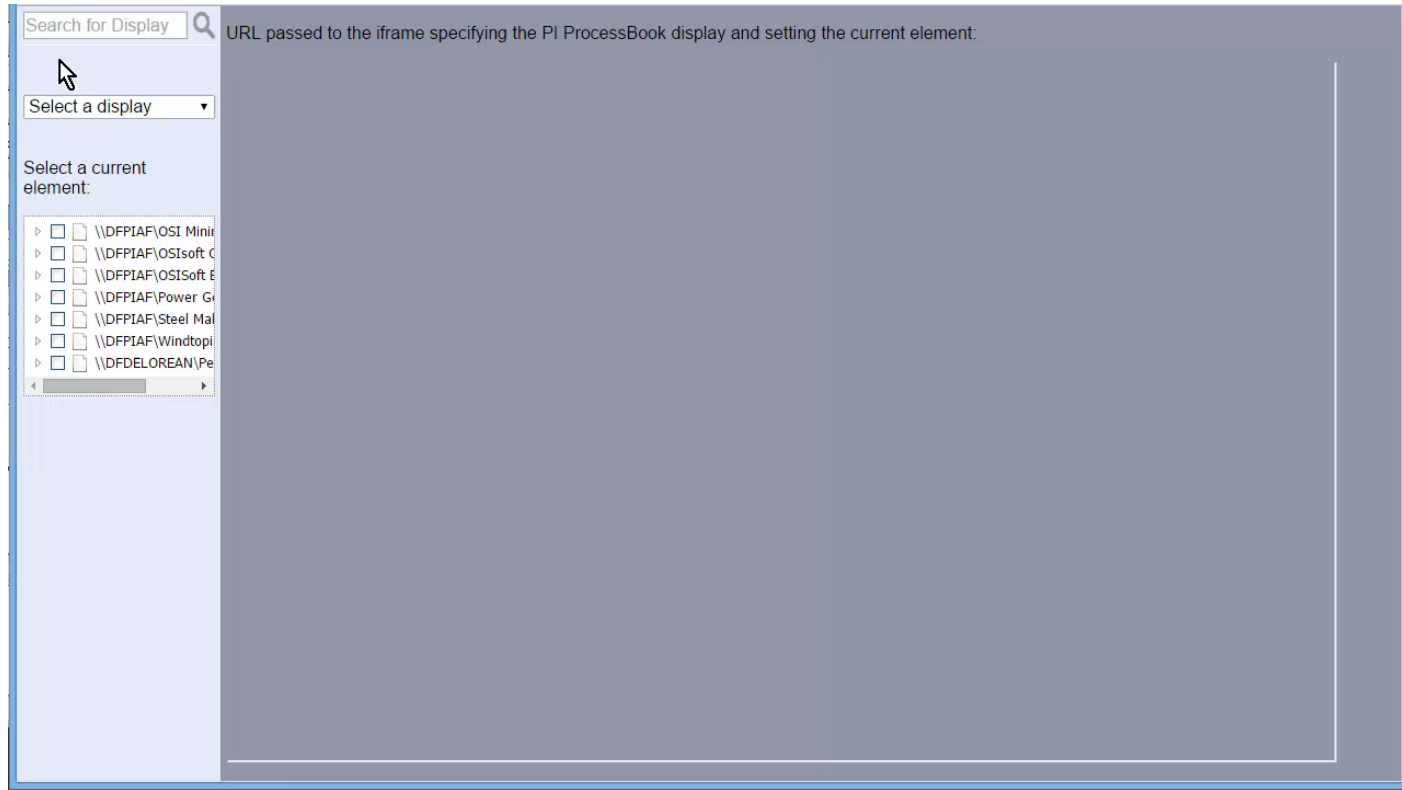


# The power of integration

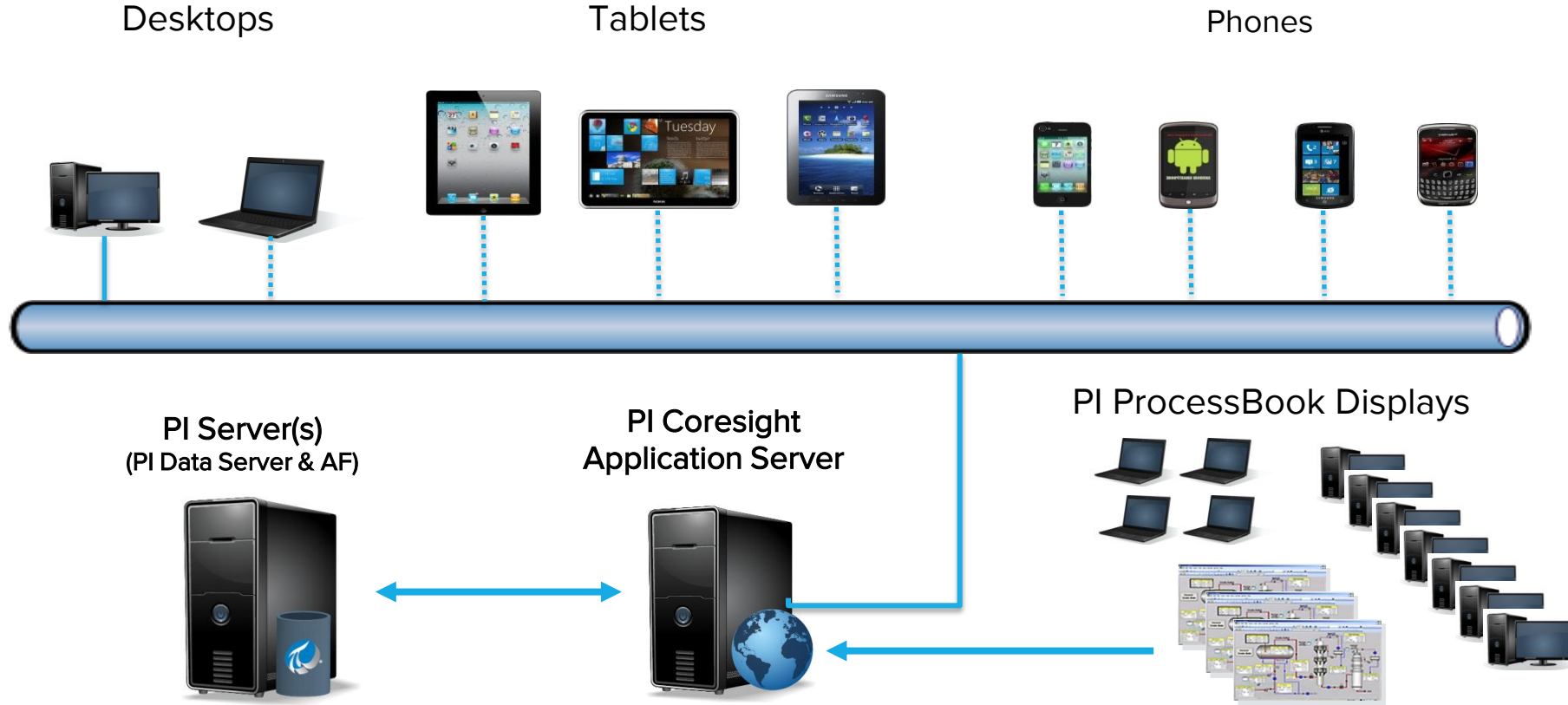
## Operations dashboard at Devon Energy



# 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 sewer system, collects and treats wastewater
  - 1,000 miles of sewer lines
  - 27 pumping stations
  - 3 treatment plants
  - 8 deep water outfalls



# How much water can we treat?

- 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
  - Northpoint 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



# Old fashioned



# Sewer System Improvement Program

- Our aging infrastructure will embark on a **20 year 6.9 billion dollar** capital improvement program
- A part of this program is the upgrade to our 15 year old DCS
- After going through several historians we finally found the right fit, **PI System**

# How we use PI Coresight 2014

The screenshot shows the PI Coresight web application interface. The browser address bar displays <http://pi/Coresight/>. The application header includes the PI Coresight logo, a search bar, and a "New Display" button. The main content area is titled "All Displays (334)" and features a grid of 12 display thumbnails. Each thumbnail includes a title, a brief description, and icons for user management, settings, and favorites.

**Search All Displays**  
Filter by Labels

- ALL DISPLAYS
- FAVORITES
- MY DISPLAYS
- RECENT
- FOLDER HOME
- SOUTHEAST PLANT
- OCEANSIDE PLANT
- NORTHPOINT PLANT
- TREASURE ISLAND
- SHARED

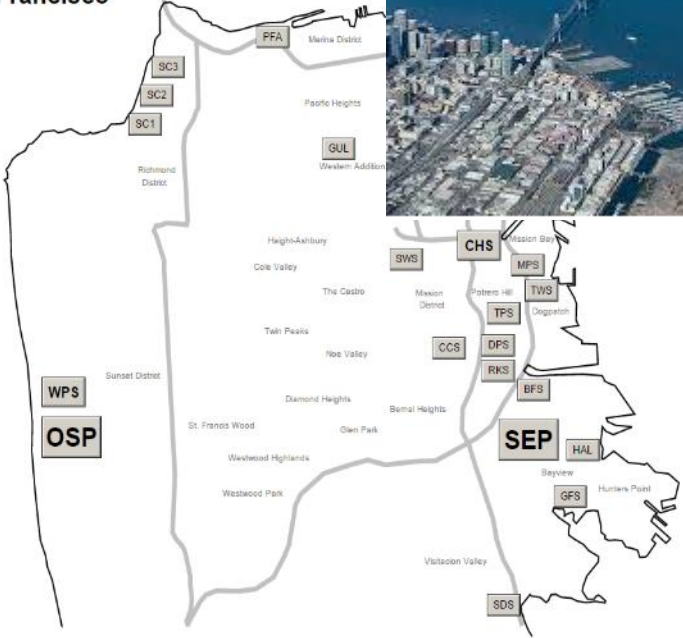
**All Displays (334)**

- Griffith Pump Station**  
BUILTIN\Administrators
- Collection Overview**  
BUILTIN\Administrators
- San Francisco Overview**  
BUILTIN\Administrators
- Booster Pump Station**  
BUILTIN\Administrators
- Channel Pump Station**  
BUILTIN\Administrators
- Treasure Island Overview**  
BUILTIN\Administrators
- PIML TEST**  
BUILTIN\Administrators
- George's Magic**  
DCS\mchung
- BLDG 511 HYPOCHLORITE STORAGE**  
BUILTIN\Administrators
- NORTH SHORE PUMP STATION**  
BUILTIN\Administrators
- PLANT OVERVIEW**  
BUILTIN\Administrators
- NPP SLUDGE AND SCUM**  
BUILTIN\Administrators

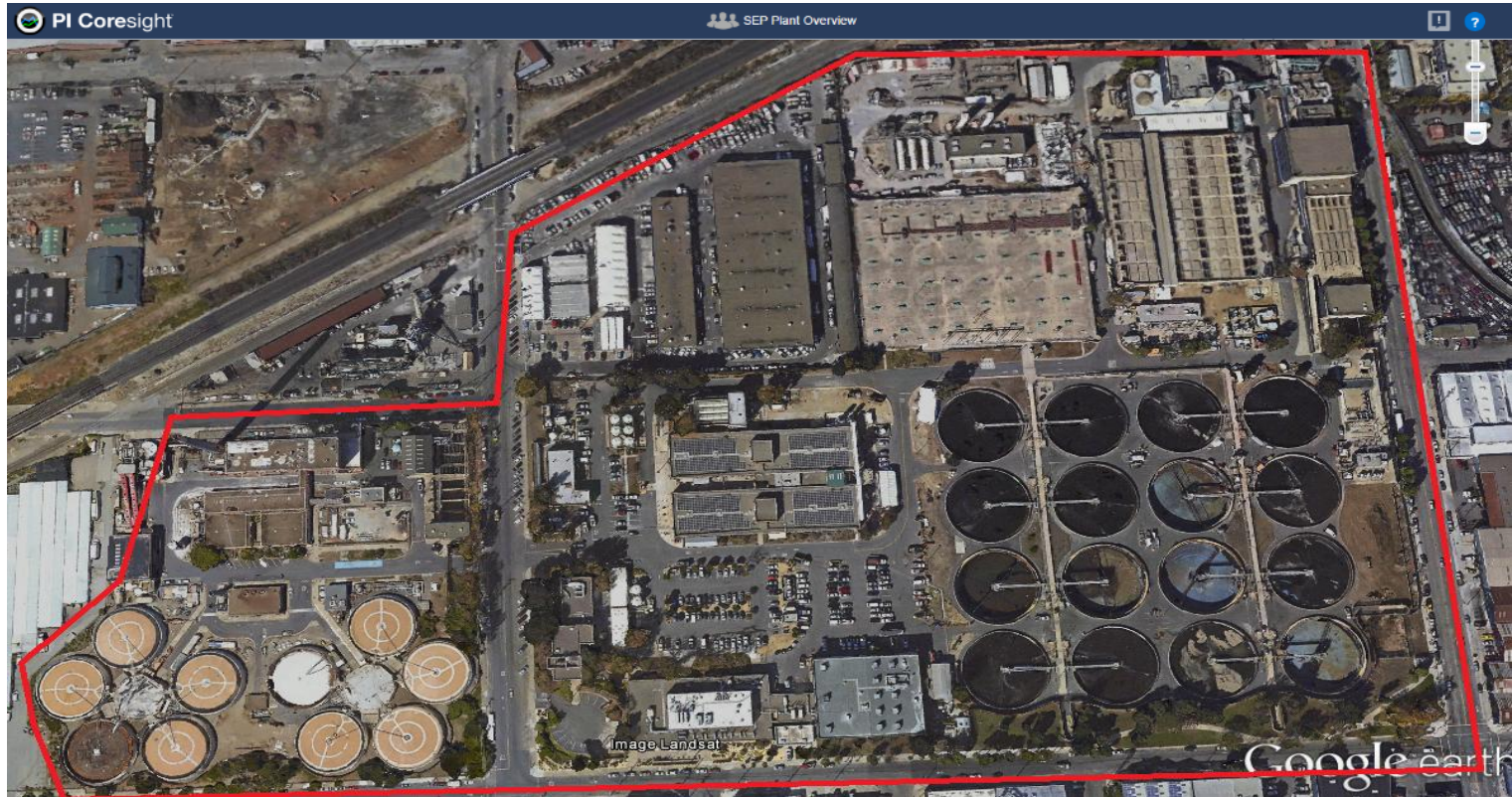
# San Francisco Overview



San Francisco

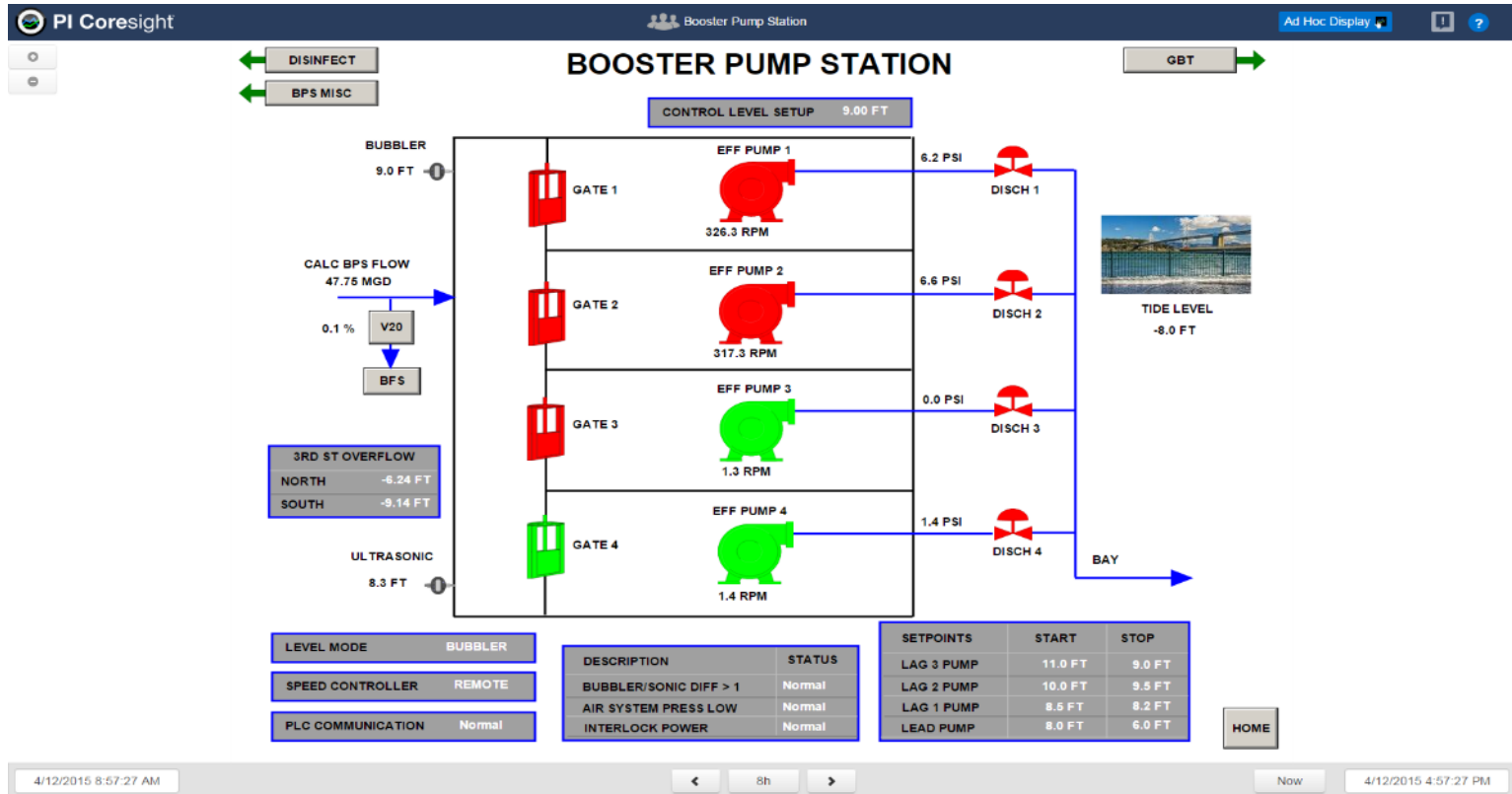


# Southeast Plant Overview

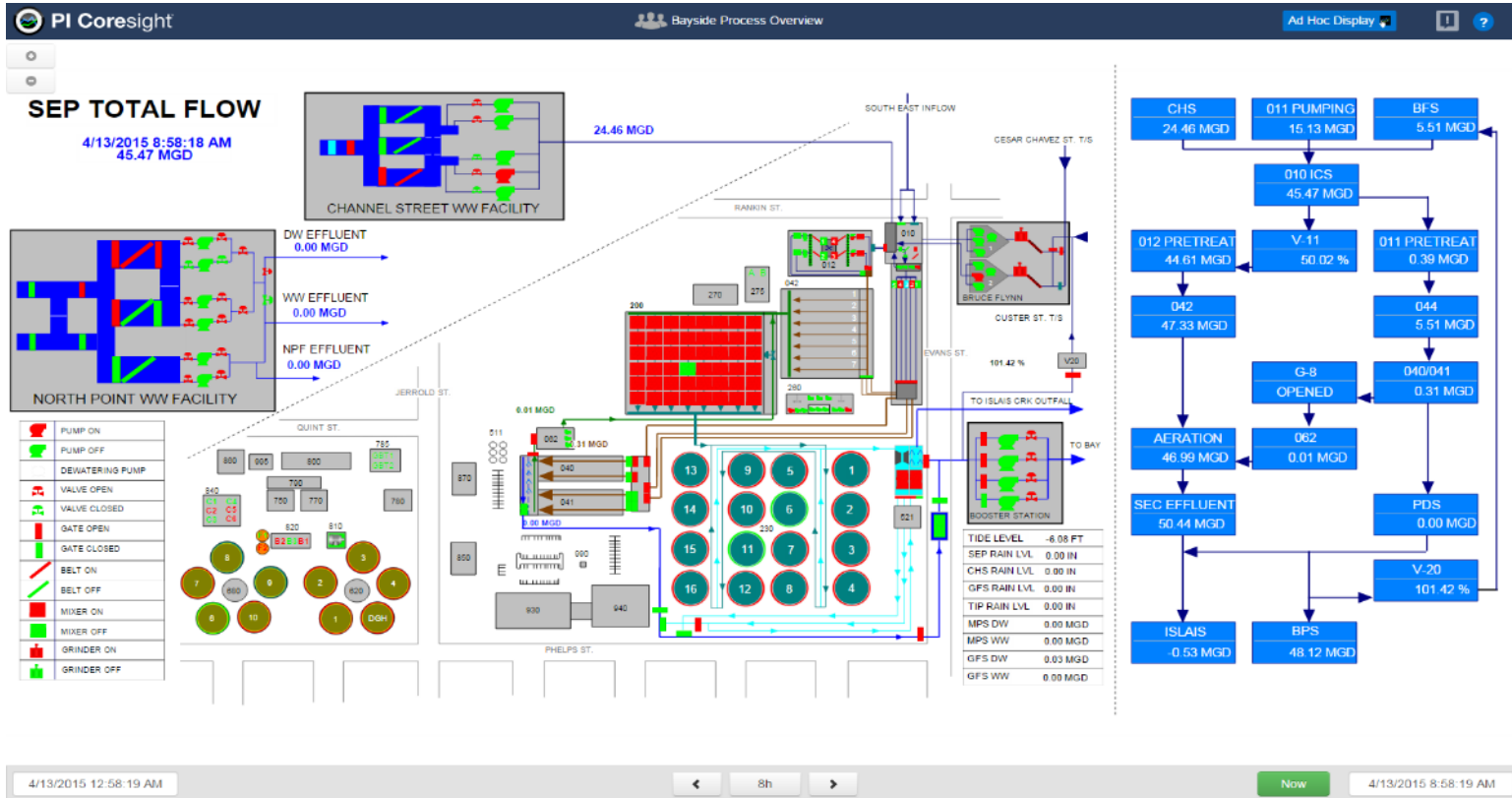




# Booster Pump Station Training

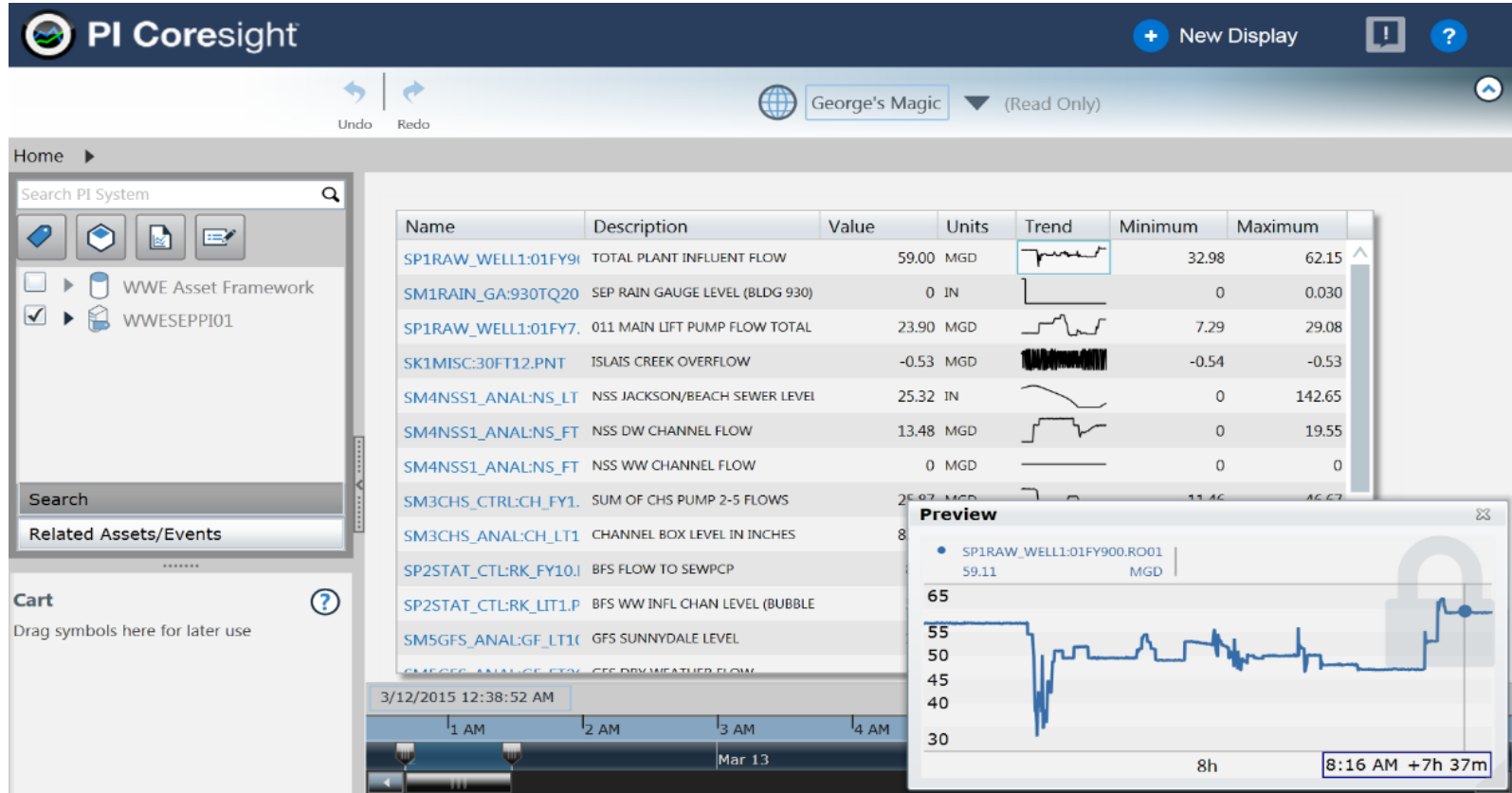


# SEP Process Overview





# 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 a 'New Display' button is on the right. Below the header, there are navigation icons for 'Undo' and 'Redo', a globe icon, and a title bar that reads 'Pump Runtimes (Mechanical)' with a '(Read Only)' status. The main content area is divided into three sections: a left sidebar, a central data table, and a bottom timeline.

**Left Sidebar:**

- Search PI System (with a magnifying glass icon)
- Icons for document, folder, and list views.
- Tree view showing 'WWE Asset Framework' and 'WWESEPP101'.
- A 'Search' button.
- A 'Related Assets/Events' section.
- A 'Cart' section with the text 'Drag symbols here for later use' and a question mark icon.

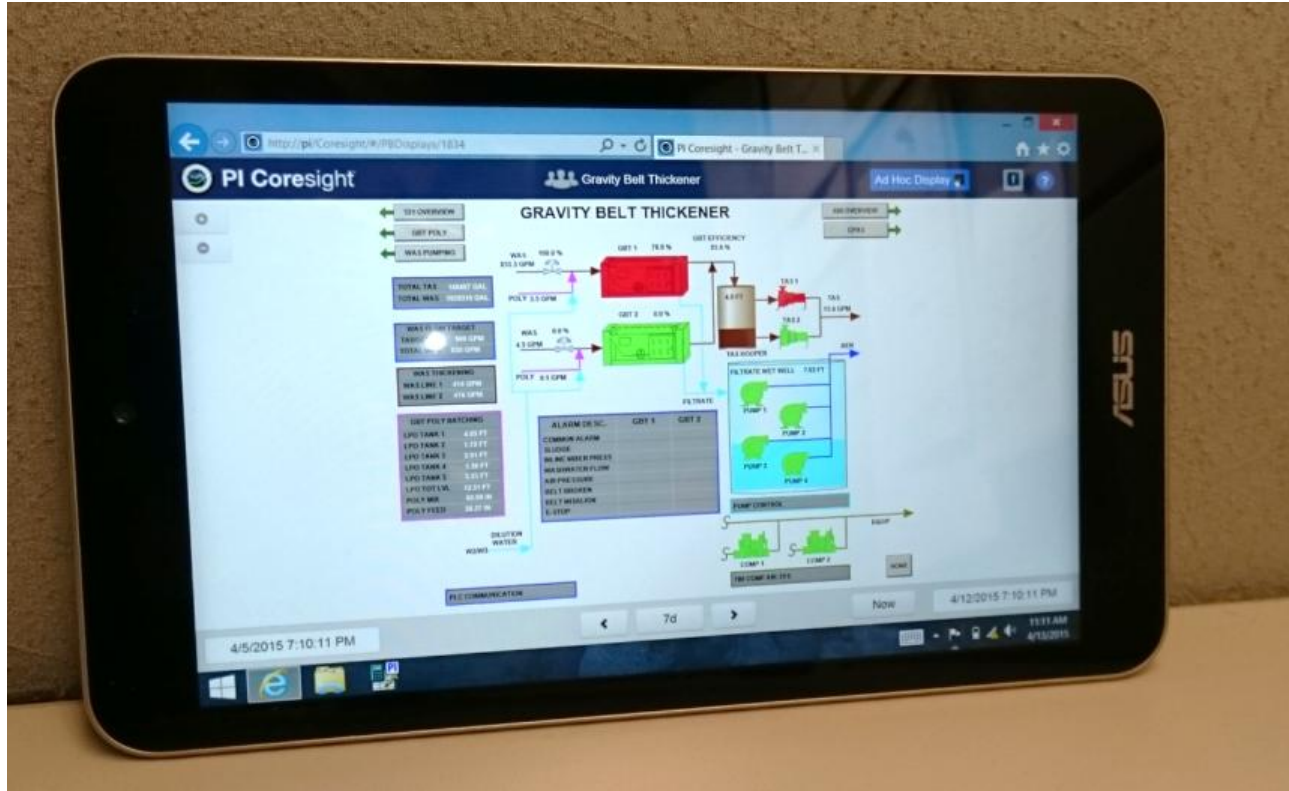
**Central Data Table:**

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'. It includes a 'Now' button and a '365d' filter. Below the date range, there are two rows of year labels: 'Jan'14, Feb'14, Mar'14, Apr'14, May'14, Jun'14, Jul'14, Aug'14, Sep'14, Oct'14, Nov'14, Dec'14' and '5, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015'.

# Access Coresight w/ Tablet Devices



# PI Asset Framework

WAPWWE - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute

Elements

- Elements
  - LIMS
    - SEP
      - CAKE
      - CENTRATE
      - CPAS
      - DIGESTER01
      - DIGESTER02
      - DIGESTER03
      - DIGESTER04
      - DIGESTER06
      - DIGESTER07
      - DIGESTER10
      - ACID\_VOL
      - ALKALINITY
      - PH
      - TEMP\_F
      - TS
      - TVS
    - FE
    - FILTRATE
    - GREASETANK
    - MLN
    - MLS
    - PPR
    - PRI
    - RAS
    - RAW
    - SEC\_EFF
    - TAS
    - WAS
  - Maximo
  - Pilots
  - Reclaimed Water
    - Bauman Landscape and Construction Inc
    - Cal-Con Pumping Inc
    - Candlestick Contractors
    - CSD Sewer Operation - WVE
    - Devcon Construction Inc
    - Foundation Constructor
    - Golden Gate Bridge Highway and Transportation
    - S.F. DPW-BSES
    - Skyline Construction
    - Team North Construction Services, Inc

PH

General Child Elements Attributes Ports Version

Filter

Name	Value	Timestamp
GRAB	7.32 pH	6/29/2015 12:00:00 AM

Time Series Data

Archive Sampled Plot Summary

Attribute: GRAB

Start Time: 6/1/2015 7:25:46 AM End Time:

Retrieval Type: Time Range Boundary Type: Inside

Filter: ☐ Show Filtered

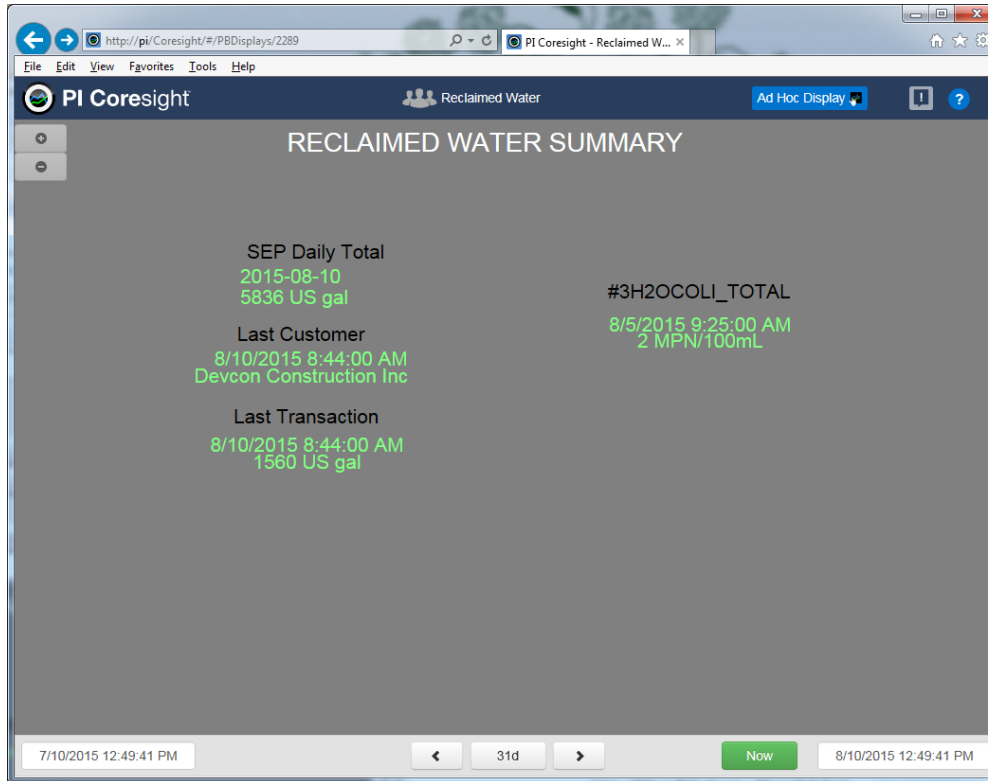
Reset Refresh

Timestamp	Value
6/15/2015 12:00:00 AM	7.46 pH
6/17/2015 12:00:00 AM	7.23 pH
6/19/2015 12:00:00 AM	7.41 pH
6/22/2015 12:00:00 AM	7.27 pH
6/24/2015 12:00:00 AM	7.4 pH
6/26/2015 12:00:00 AM	7.3 pH
6/29/2015 12:00:00 AM	7.32 pH

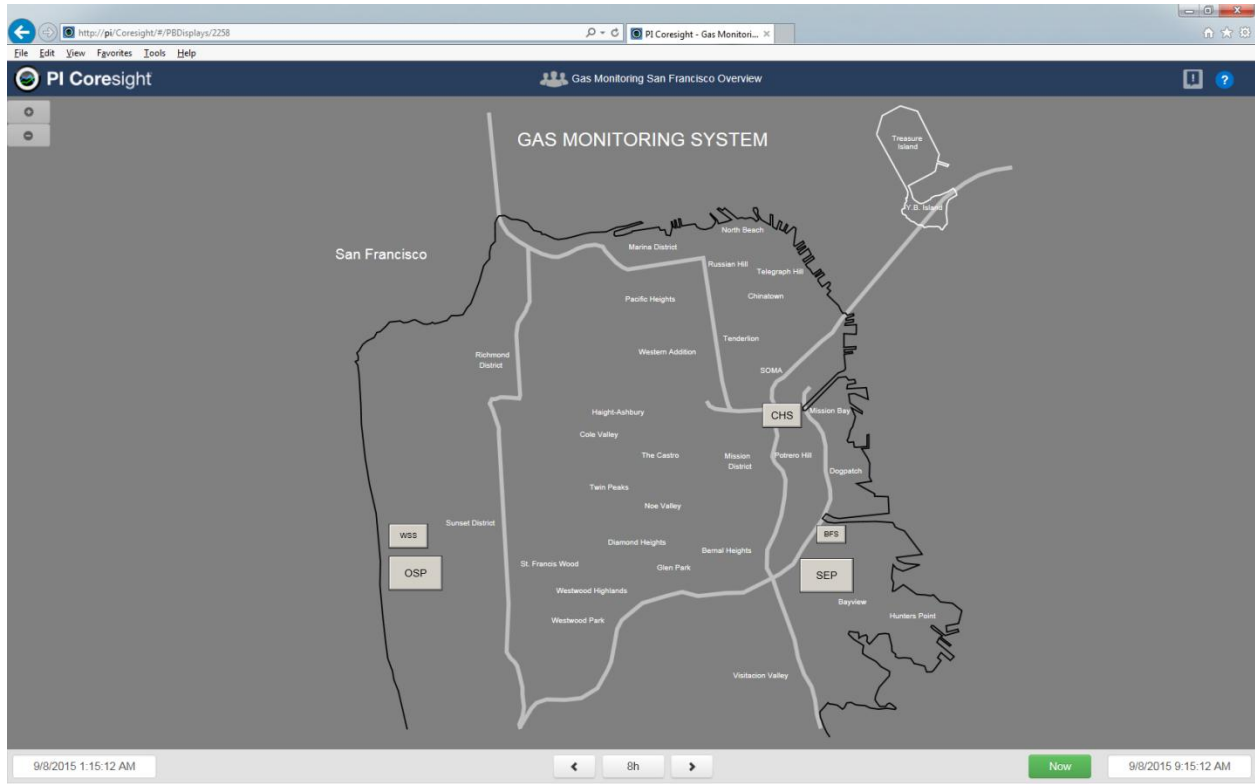
12 results returned in 0.2028039 seconds.

Close

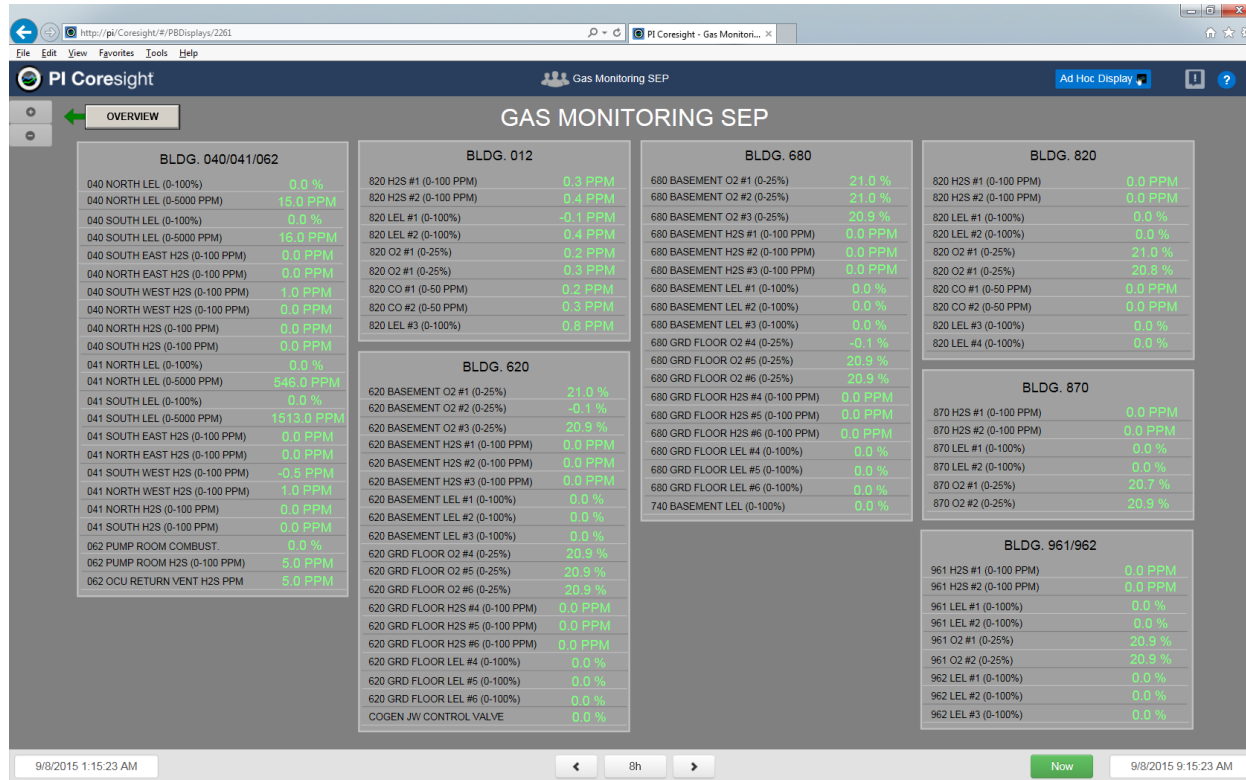
# Reclaimed Water



# Gas Monitoring System



# SEP Gas Monitoring



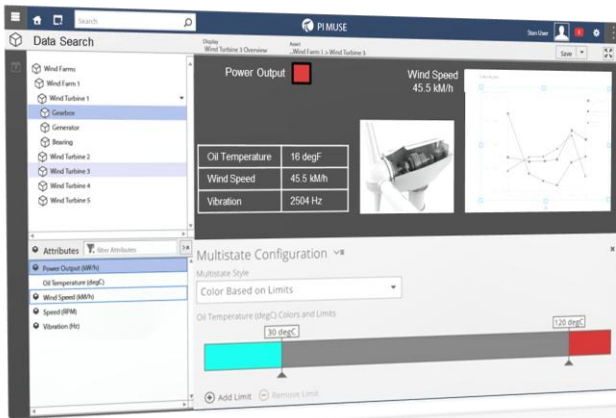


# What's planned for PI Coresight?

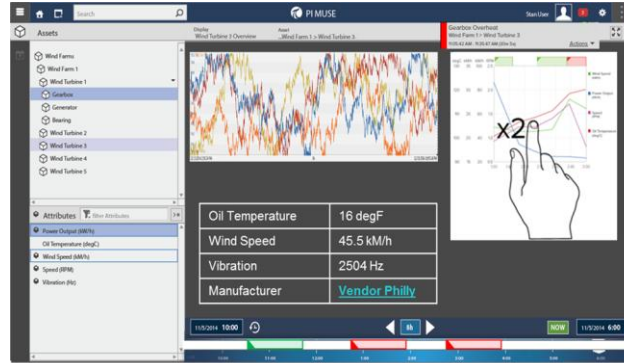




# Visualization for today's PI System



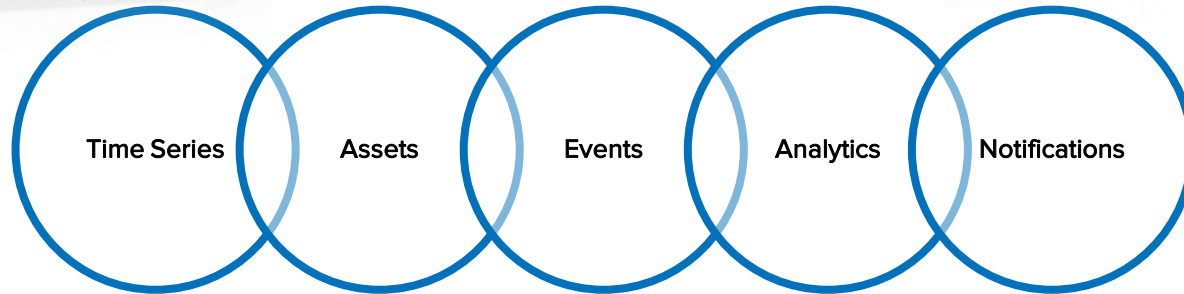
Authoring



Monitoring



Ad Hoc Analysis



Time Series

Assets

Events

Analytics

Notifications

# TODAY (2015)

PI ProcessBook

Display Editor  
Process Monitoring



 **PI Coresight™ 2.x**

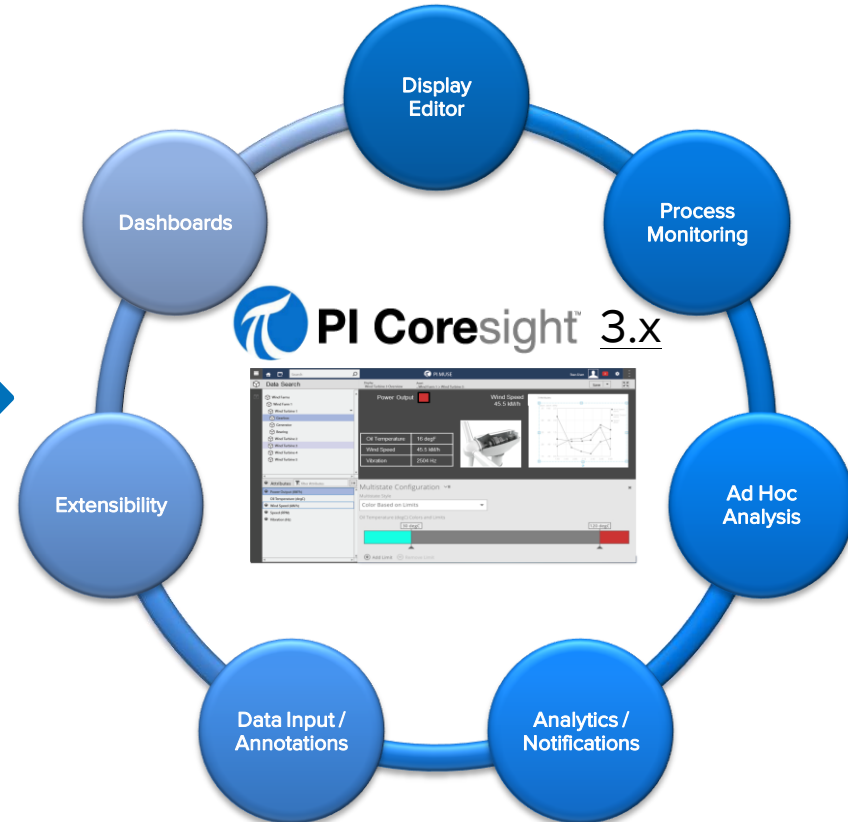
Ad Hoc Analysis  
PB Display Viewer



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.

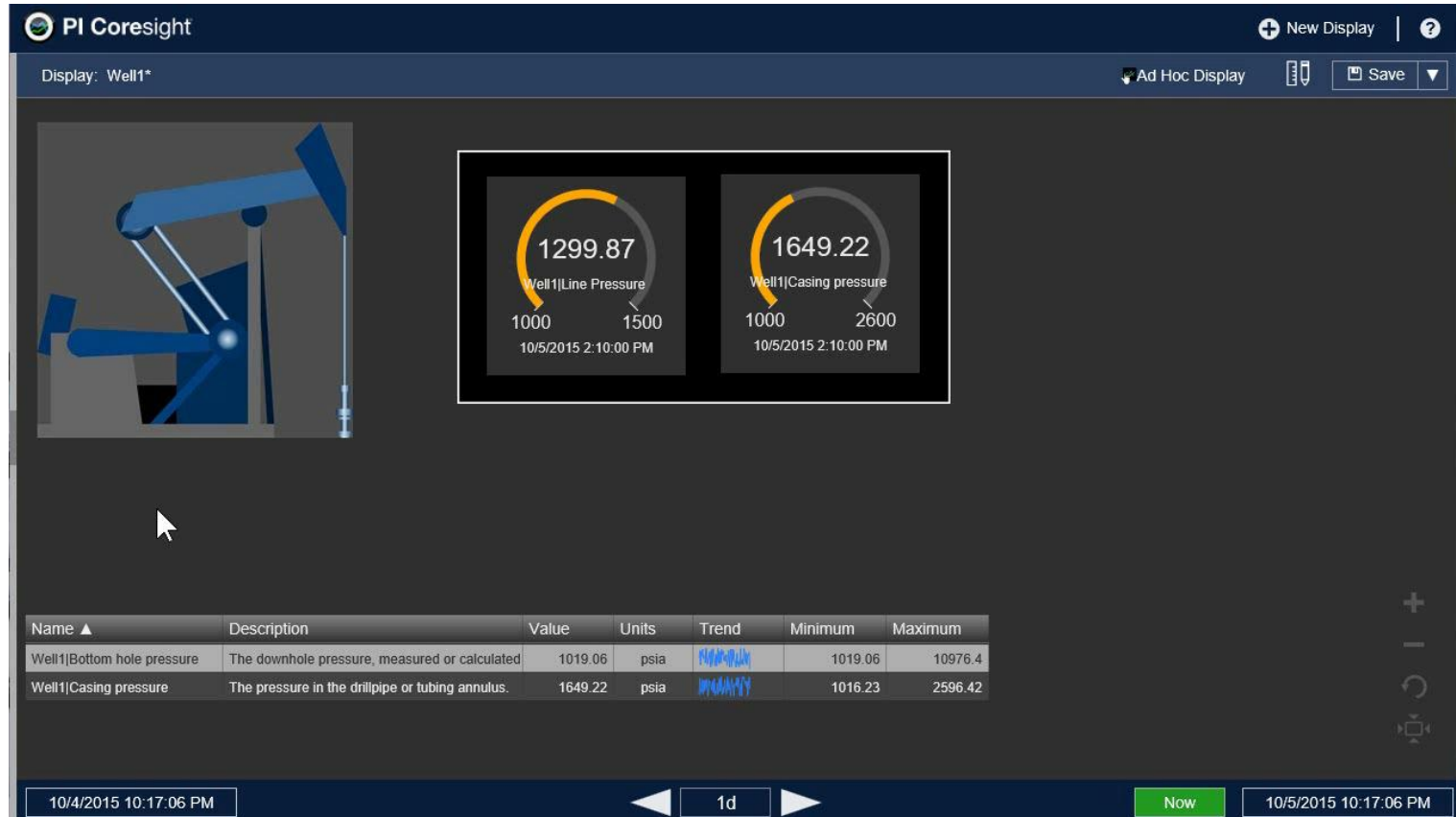
# Keep it simple...and make it look good



# Draw me a picture



Still in  
Development



# High priority interrupt





# What's important right now?



Still in  
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

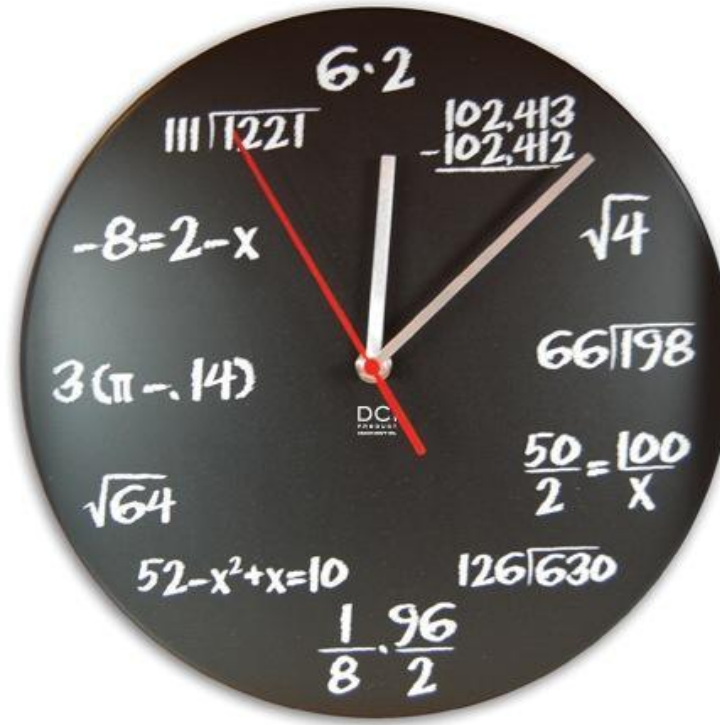
Other Actions

☐ Sed ut perspiciatis unde omnis

☐ Sed ut perspiciatis unde omnis

☐ Sed ut perspiciatis unde omnis

# Time is relative

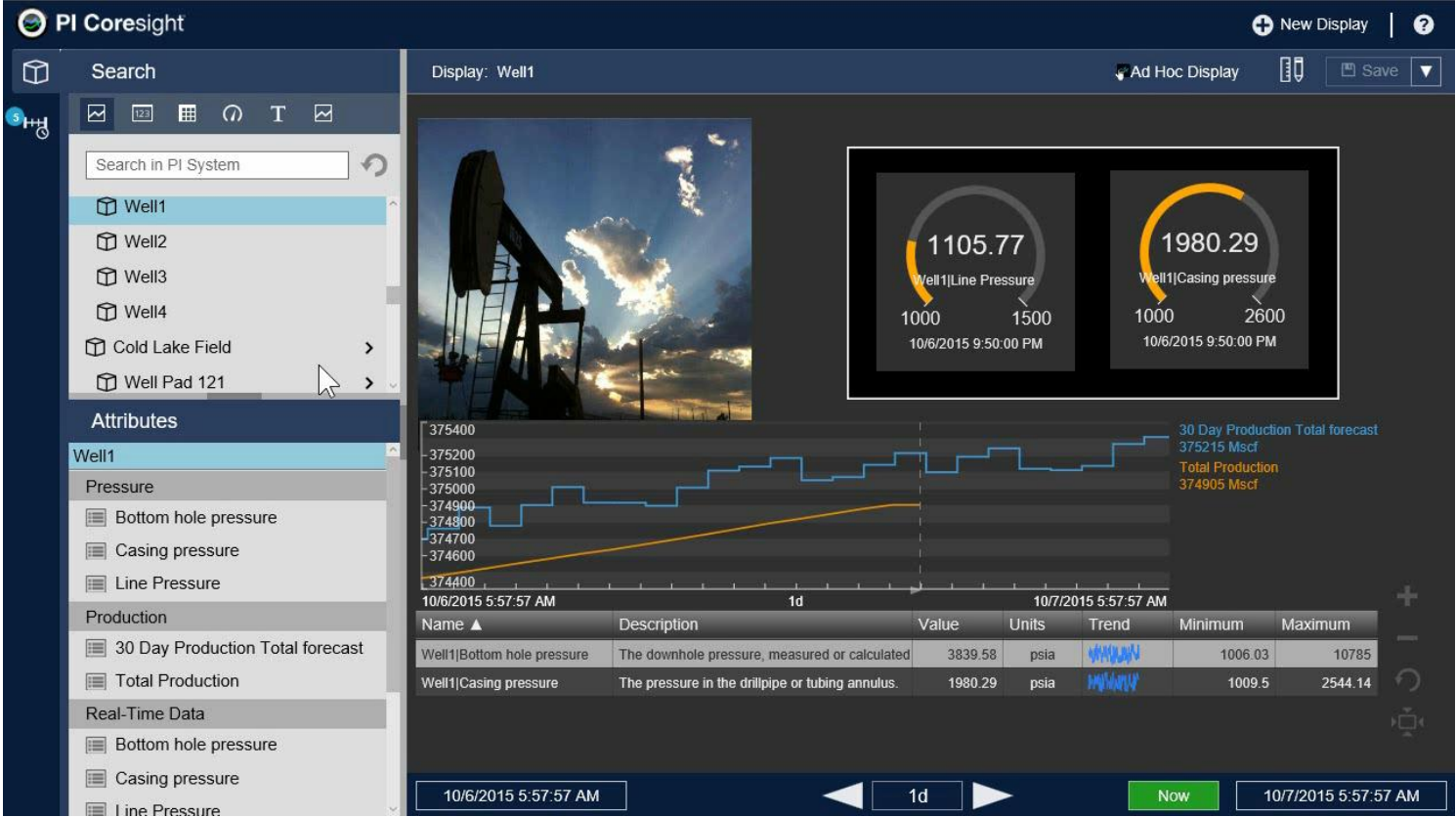




# What's different about what just happened?



Still in  
Development

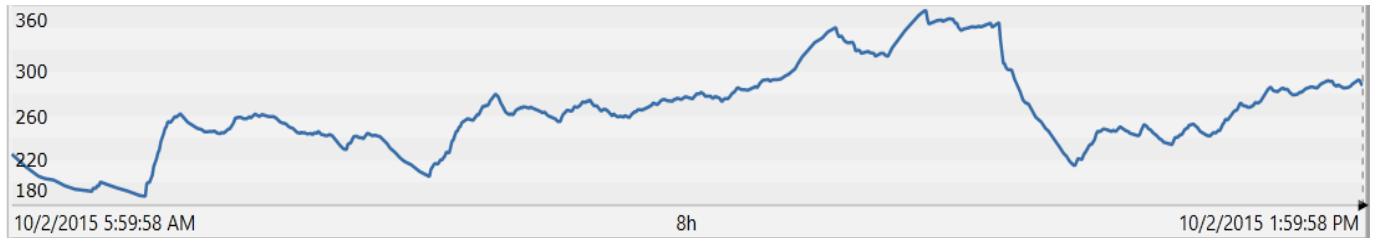
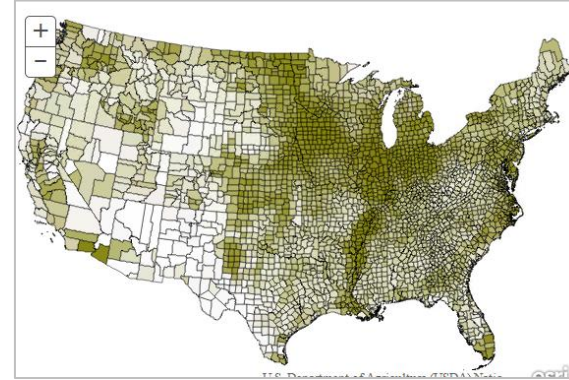
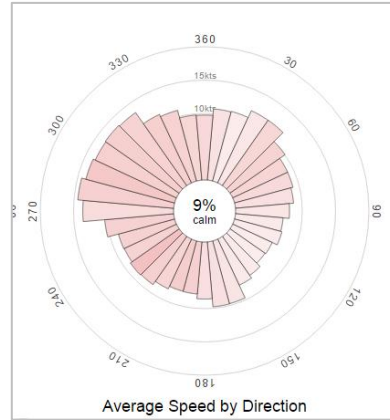
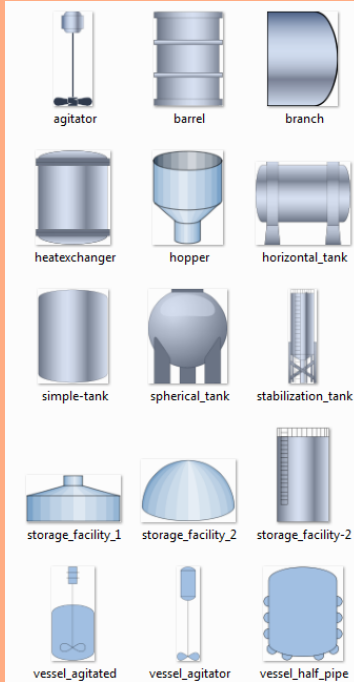


# More is better





## PetroLux Library



The PI System delivers even more value when integrated together



# For more information



Best Practices for Using and Deploying AF  
Batch Migration to Event Frames

13:00 - 13:30

13:00 - 13:30

Exploring your Data with PI Coresight  
Event Frames - How to Provide  
Context to Critical Events

14:20 - 15:30 BYOD Session

15:00 - 15:30

Using Future Data to Predict  
your Process

15:40 - 16:50 BYOD Session

A Look at the Future of PI System  
Visualization

17:00 - 17:30 Closing Keynote

# For more information



## *Day 1*

Mondi Steti's Journey to Operational Excellence

14:15 - 14:45

Centrica Energy Renewables - PI CHIPS and Peas

16:45 - 17:15

## *Day 2*

SFW - Enterprise-wide Operational Intelligence System

11:00 – 11:30

MOL - Energy Monitoring Expert System

11:00 – 11:30

A2A - Value Over Time with the PI System Infrastructure

14:00 - 14:30

**And more – Check out the recordings!**

## Summary

- Adopt PI Coresight within your business
- Unlock your valuable PI ProcessBook displays with PI Coresight's ProcessBook Viewer
- Come see us at the product expo!

## **Max Chung**

Electrical Engineer  
Wastewater Enterprise (WWE)

## **Tom LeBay**

Product Manager  
OSIsoft, LLC

## **Rene Thomassen**

Center of Excellence Engineer  
OSIsoft, LLC



# Questions

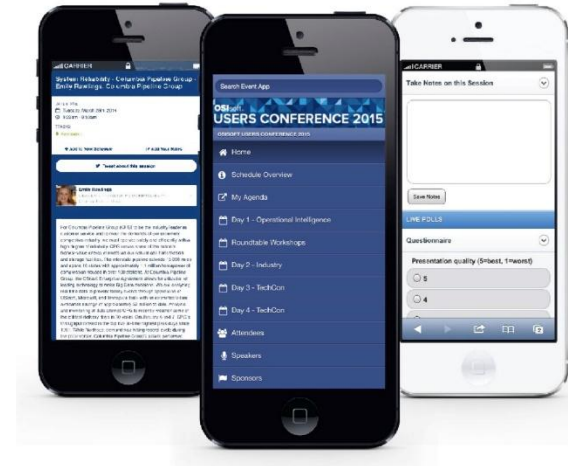
Please wait for the **microphone** before asking your questions



State your  
**name & company**

# Please don't forget to...

Complete the Online Survey  
for this session



<http://eventmobi.com/emeauc15>



감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado

Come see us at the product expo!