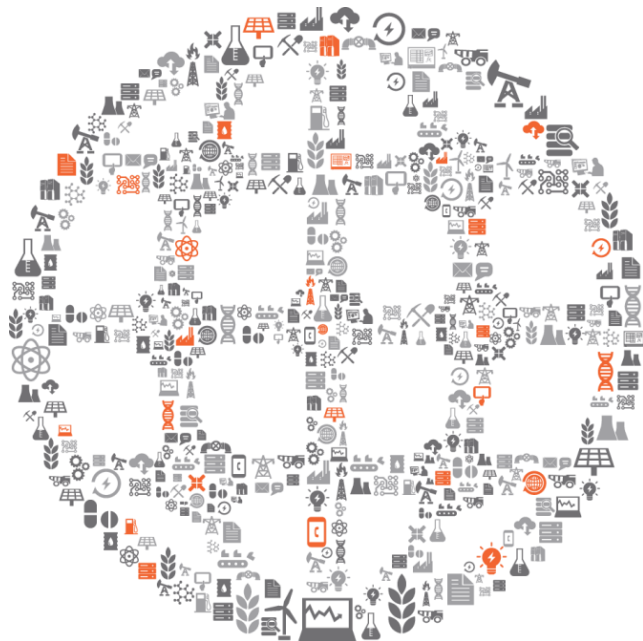




OSIsoft®
**REGIONAL
SEMINAR**
The **Power** of **Data**

**THRIVING
IN A
WORLD OF
CHANGE**



Gaining and Sharing Insights Across the Enterprise from Anywhere

Presented by Amit Dutta, adutta@osisoft.com



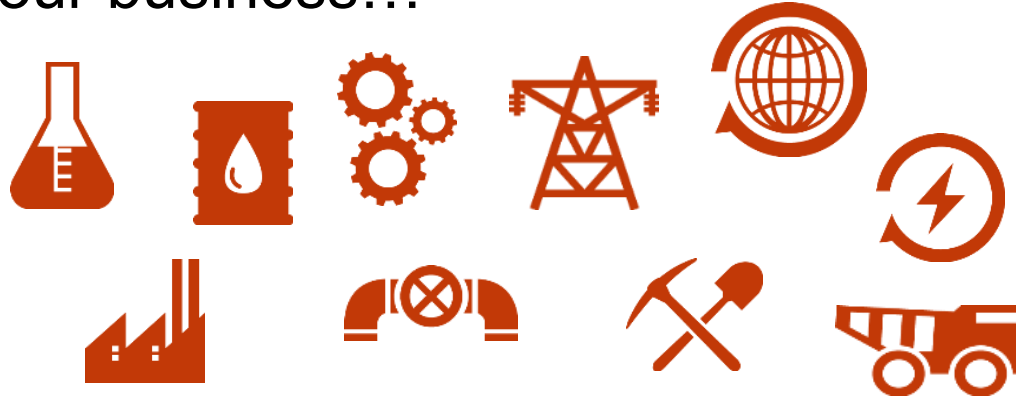
Data-driven Decisions

A recent **study at MIT** showed that organizations **relying on data** to make decisions **performed** at rates 4-6 % **higher** than their peers.*

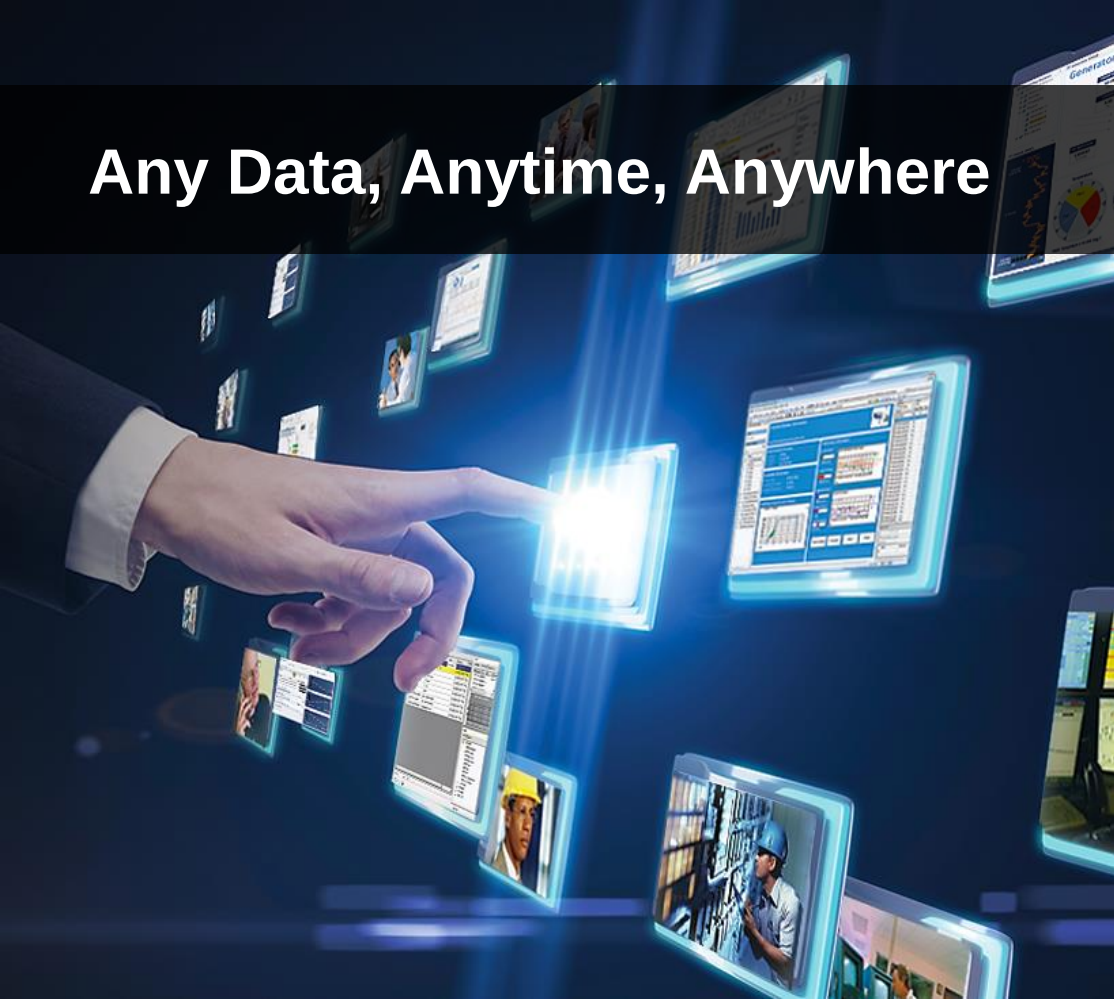
**Erik Brynjolfsson,
MIT Professor*

Sharing Insights Across the Enterprise

Operational **insights** are discovered frequently throughout your business...



...but is everyone able to **share** their discoveries **quickly**, **easily** and **effectively**?

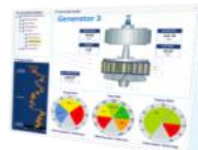


Any Data, Anytime, Anywhere

PI Visualization Suite

- Gives **every tool** at your fingertips
- To **fit your needs**
- And facilitate **enterprise-wide collaboration**

PI ActiveView



PI BatchView



PI Coresight



PI WebParts



PI ProcessBook



PI Manual Logger



PI Visualization Suite



PI DataLink



The PI System Client Tools

- **PI Coresight** for ad hoc analysis and collaboration with mobility
- **PI ProcessBook** for display building and monitoring
- **PI DataLink** for analysis and reporting
- **PI WebParts** for enterprise-wide collaboration
- **PI Manual Logger** for manual data collection



PI Manual Logger

Explore

Report

Monitor

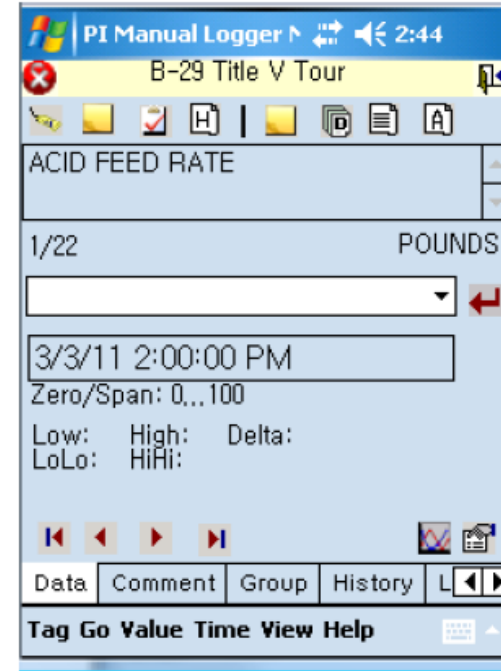
Collaborate

Share

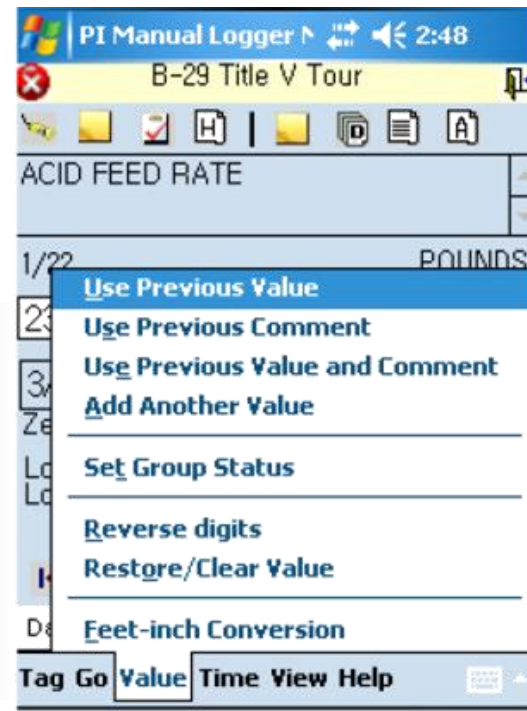
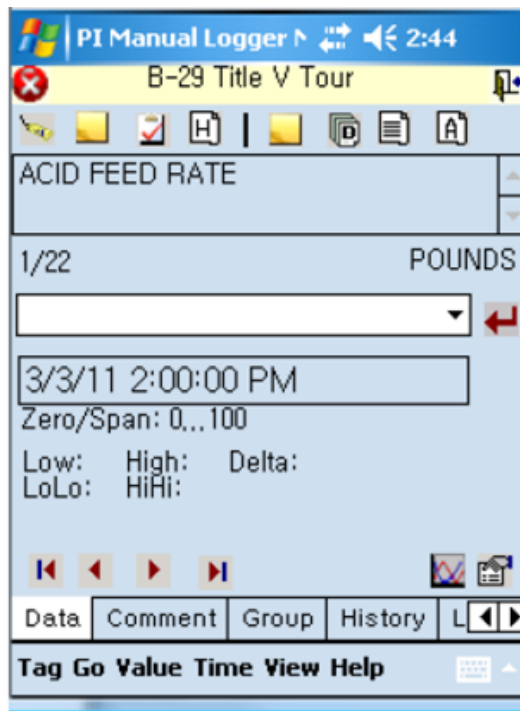
Review

Collect

- **Manual entries** are oftentimes crucial
- **Centralized** configuration based on **tours** and **runs**
- Available on computers and mobile devices (**Windows Mobile**)



Case Study – Eastman Chemical





DEMO



PI Notifications and Visualization Tools

Recycle Bin

Documents

ZoomIt.exe

ZoomIt64.exe

Site\WTG03\Notifications[Low Rotor Speed] generated a new notification event. - Message (HTML)

FILE MESSAGE

Ignore Delete Reply Reply All Forward IM Meeting Move to: ? To Manager Team Email Quick Steps Move Rules OneNote Actions Mark Unread Categorize Follow Up Translate Find Related Select Zoom

Tue 8/20/2013 2:01 PM

PInotAdmin

Site\WTG03\Notifications[Low Rotor Speed] generated a new notification event.

To: Louis-Philippe Page-Morin

Message Wind Turbines Status.pdi (256 KB)

Low Rotor Speed - WTG03

Trigger Time: 08/20/2013 14:01:00
State: OutsideControl **Priority:** Normal

Attribute	Value	Timestamp
Rotor Speed	2.356rpm	08/20/2013 14:01:00
Wind Speed	6.997m/s	08/20/2013 14:01:00

[Instant PI WebParts Trend](#)

Actions:
[Acknowledge With Comment](#)

Some People Pane features are turned off because Windows Desktop Search isn't available.



DEMO

PI WebParts

Explore

Report

Monitor

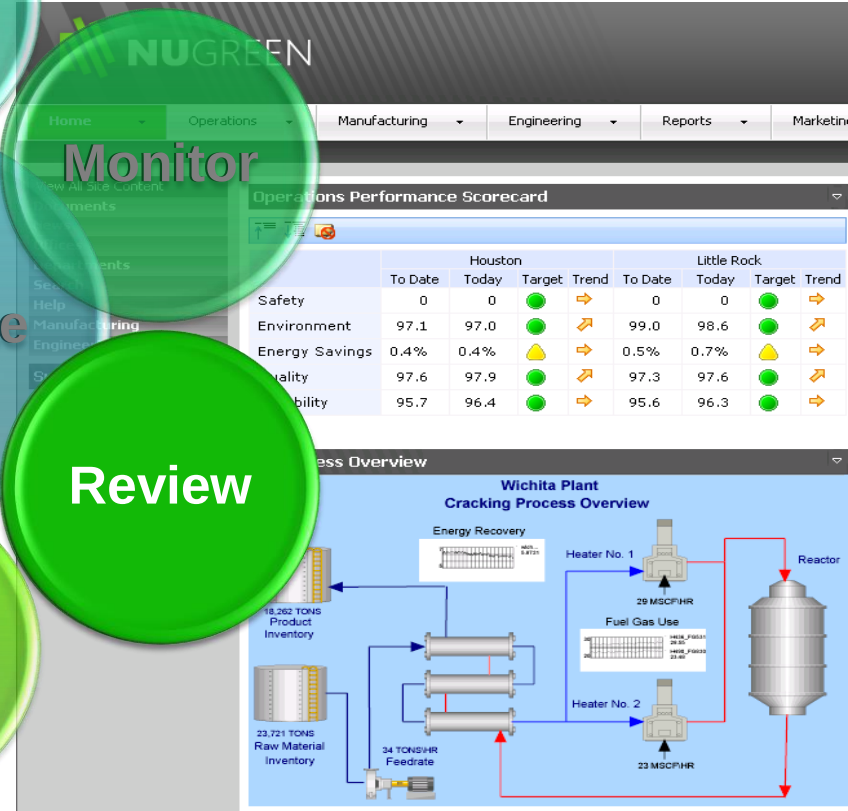
Collaborate

Share

Review

Collect

- Interactive web interface for **Microsoft SharePoint**
- Allow **real-time** visualization of operational data
- **Share** displays and reports to a wider audience





Sandbox

EDIT LINKS

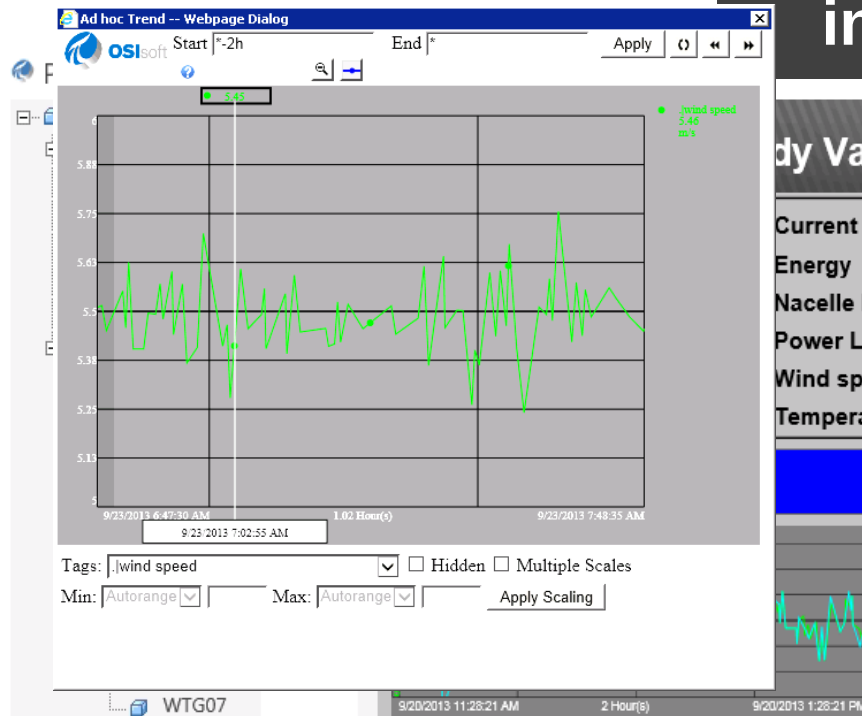
NuGreen Energy

Home

Documents

Site Contents

EDIT LINKS

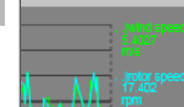
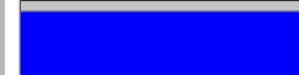


PI ProcessBook Displays in Microsoft SharePoint

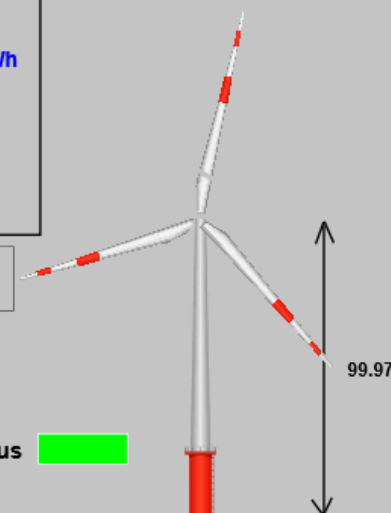
dy Valley WTG01

PI Coresight Display

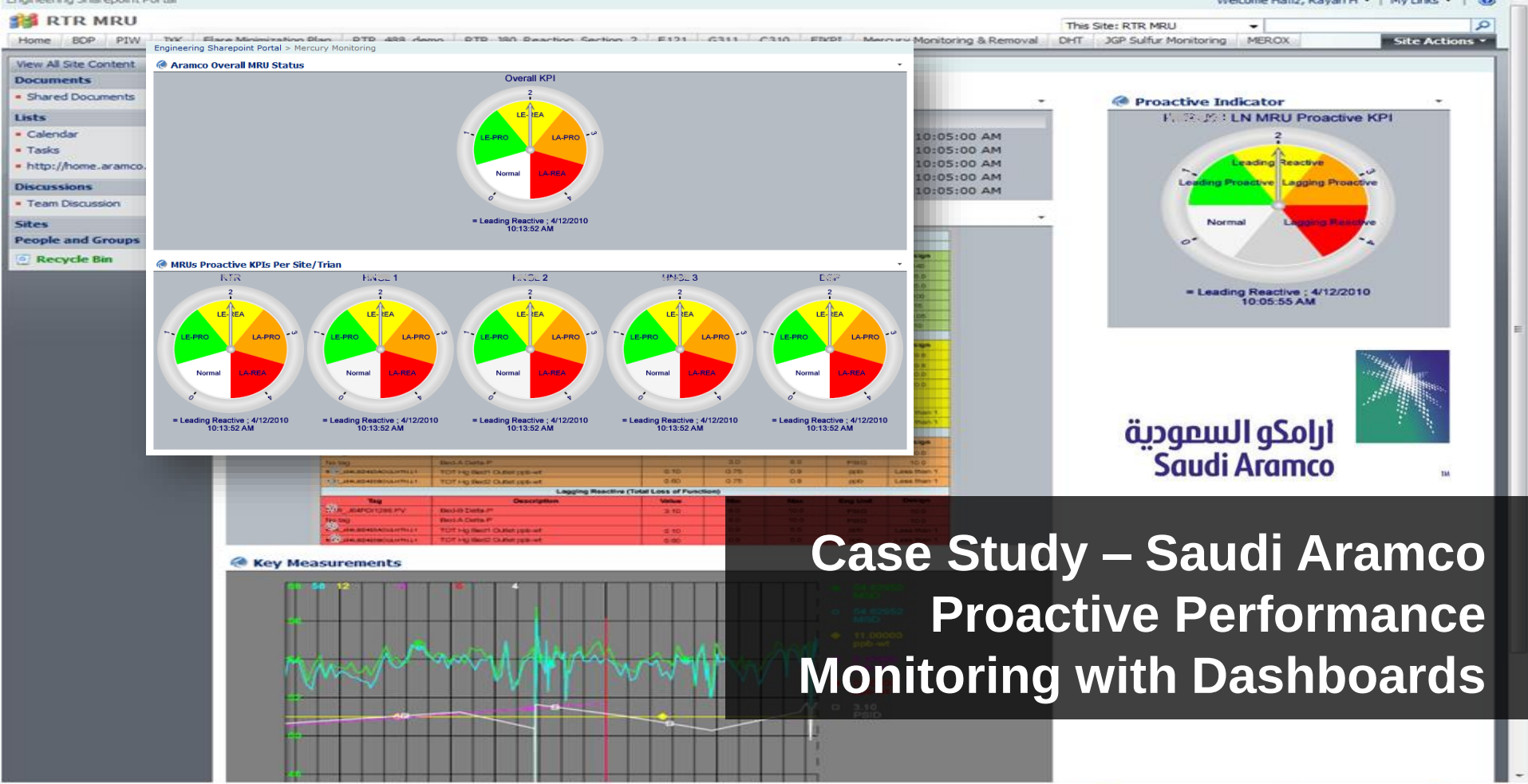
Current L1 358.05 kA
Energy 903.44 kWh
Nacelle Position 358.75 °
Power Load 59.62
Wind speed 5.40 m/s
Temperature 14.86 °C



Status



99.97



Proactive Performance Monitoring with Dashboards

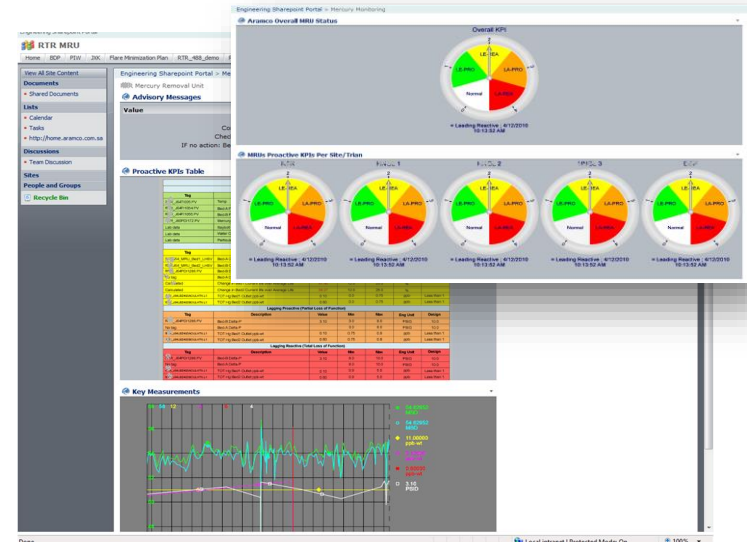
Saudi Aramco needed a proactive solution to monitor and improve performance. After implementing **PI WebParts**, the impact on **performance improvement** meant multiple millions of dollars in additional revenue.

Rayan Hafiz

Saudi Arabian Oil Company

OSIsoft UC 2010

أرامكو السعودية
Saudi Aramco



Business Challenge

- The process is **not fully monitored**
- Final products **selling prices are highly sensitive** to mercury levels in the process and need to be **better monitored**

Solution

- PI WebParts to **see into the process from anywhere**
- **Dashboards and KPI** screens to fully monitor the process
- **Predictive model** to prevent problems in the process

Results and Benefits

- **Complete monitoring** and management with proactive tools
- **Solutions template** could be used for other applications
- The OSIsoft tools **removed layers of complication**

PI ProcessBook

Explore

Report

Monitor

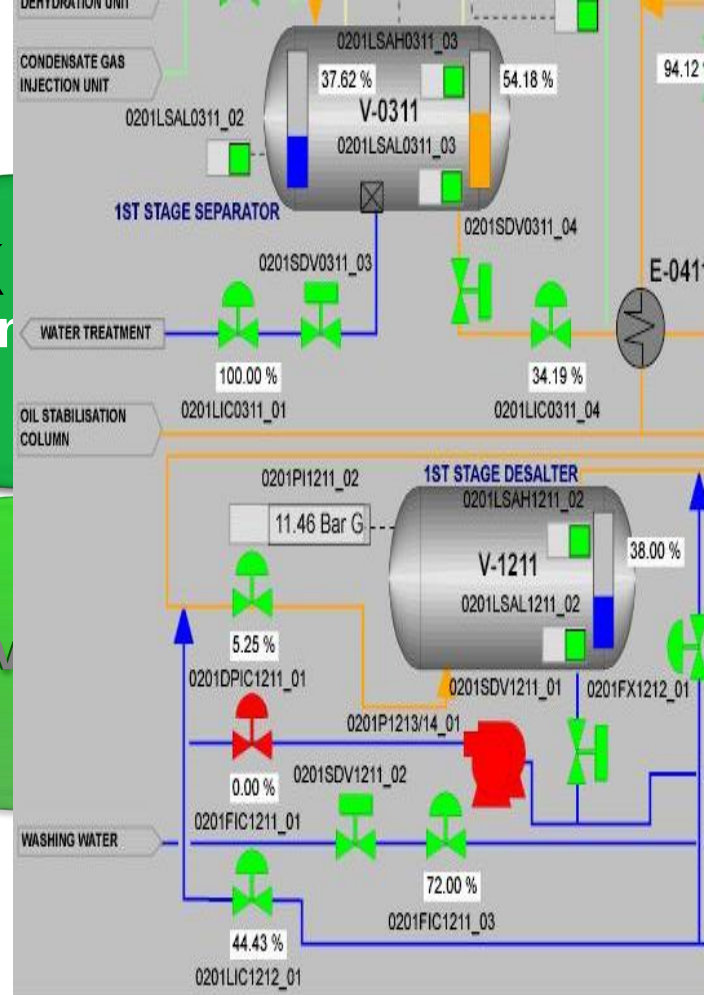
Collaborate

Share

Review

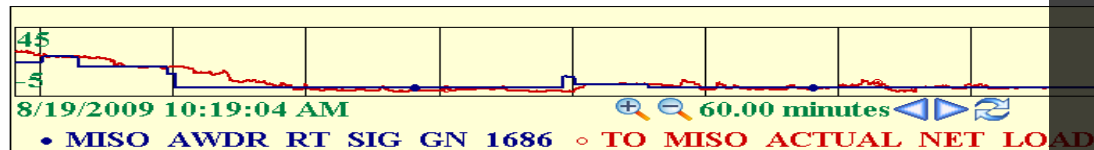
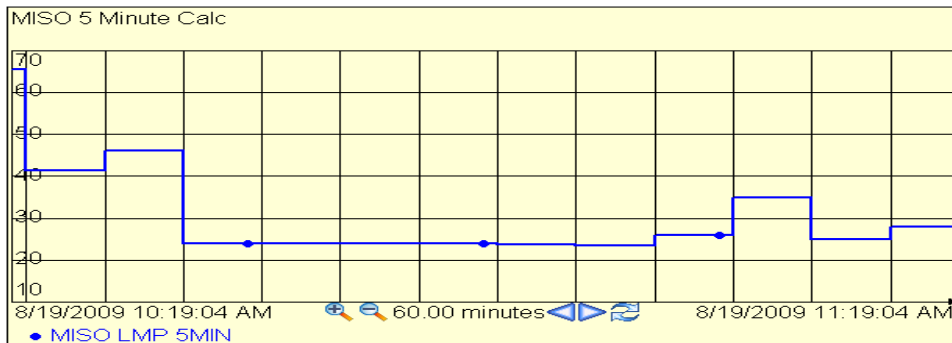
Collect

- Display of **real-time and historical data**
 - Process representation
 - **Trend** with traces
 - Context management with PIAE
- Allow for **process monitoring** and review of problematic events



Demand Response Overview

	Real Energy	Regulation	Spin Reserve
Cleared	19	18	00
Deployed	19	00	00



TOTAL POT LINE LOAD: **455.39 MW**

OCB 1500		91.3
OCB 1502		90.8
OCB 1503		92.8
OCB 1504		90.4
GCS 3805		00.0
GCS 3806		90.0
GCS 3800		00.0

Current Average Price **28.50 dollars**
 5-MIN LMP Price **28.05 dollars**
 Last Hour LMP Price **31.75 dollars**

**Case Study – Alcoa
 Demand/Response and
 Adaptation**

Homepage

Energy Flow

WPP Switchyard

Generation Trends

Warrick Overview

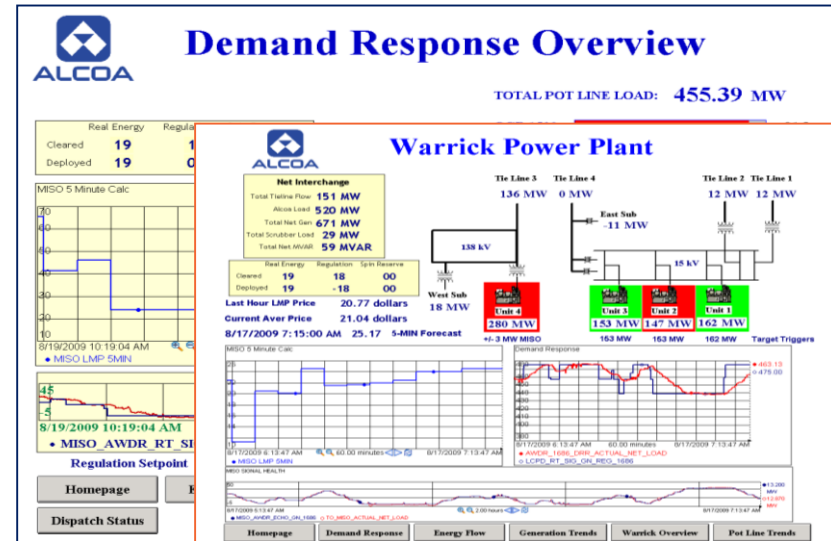
Pot Line Trends

Dispatch Status

Industrial Scale Demand/Response

- **Warrick** is Alcoa's Largest Operating US Aluminum Smelter
- **330,000 MT** capacity/year
- **Energy is 30-40%** of Aluminum Production Costs
- Generate power for Smelter & Rigid Packaging

Brian Helms
Power Markets Coordinator
Alcoa Power Generation



Business Challenge

- Worldwide commodities **price competition**
- Older (**1960s**) facility
- Business took a major hit due to **economic downturn**
- Needed to find a way to **sustain the business**

Solution

- **PI System for energy regulation**: sell generated electricity to **Midwest ISO**
- **Monitor Midwest ISO** for energy demand notifications
- Submit **forecasted load data** from the PI System

Results and Benefits

- Project **payback was in 4 months** (cost \$700,000)
- System **runs efficiently**
- Money help to **sustain the aluminum business**
- Revenues now **above competition**

PI DataLink

Explore

Report

Collaborate

Monitor

Forecast

- Allows **summary calculations** and **filtering** of the data
- Enhances PI System Data with access to **Microsoft Excel reporting** features

	A	B	C	D
1	Début	5/27/2010 13:40		
2	Fin	5/28/2010 13:40		
3				
4	Date	BA:CONC.1	BA:LEVEL.1	BA:TEMP.1
5	27-May-10 13:51:28	43.80355835	0.69	5.41
6	27-May-10 13:51:58	0	0.00	0.00
7	27-May-10 14:07:28	5.801473618	12.40	10.64
8	27-May-10 14:19:58	18.39671898	21.03	20.03
9	27-May-10 14:45:58	25.30208397	39.79	45.05
10	27-May-10 14:55:28	40.00126648	33.46	28.58
11	27-May-10 15:12:28	42.83501053	0.65	0.83
12	27-May-10 15:12:58	0	0.00	0.89
13	27-May-10 15:27:28	5.907530308	10.27	10.69
14	27-May-10 15:42:28	20.59512711	22.60	20.78
15	27-May-10 16:06:58	27.59270096	37.20	42.05
16	27-May-10 16:13:28	39.76164246	35.06	27.03
17	27-May-10 16:33:28	43.08703995	0.53	0.92
18	27-May-10 16:33:58	0	0.60	0.98
19	27-May-10 16:50:58	6.635637283	13.87	13.76
20	27-May-10 17:06:58	19.4419651	24.95	20.57
21	27-May-10 17:26:58	25.28218265	27.14	21.21

J13 : =IF(I13<5,"Normal","Alert")

Simhadri Super Thermal Power Station Unit # 1									
10-01-2011 14:59			UNIT OVERVIEW				Press 'F9' to Refresh Data		
S No.	Parameter	Current Value	Avg Value of Last 02 Hour	Deviation from Average	S No.	Parameter	Current Value	Avg Value of Last 02 Hour	Deviation from Average
BOILER					TURBINE				
1	Load	524.70	525.62	Normal	1	Turbine Speed	2979.97	2978.12	Normal
2	Total Coal Flow	376.07	377.45	Normal	2	Throttle Press	170.56	171.78	Alert
3	Total Air Flow	1725.69	1743.93	Normal	3	First Stage Press	166.04	166.04	Normal
4	Drum Pressure	192.15	192.95	Normal	4	Max Shaft Vibration (SHAFT VIB HPTR X)	155.18	154.26	Normal
5	MS Temp Left	530.33	530.12	Normal	5	Max Brg Vibration (BRG VIB EXCT-X)	56.02	57.27	Normal
6	MS Temp Right	530.33	529.47	Normal	6	Max Brg Temp (BRG-3 REAR BOT RGT)	10.66	10.66	Normal
7	HRH Temp Left	534.85	531.92	Normal	7	Trip Oil Pressure	10.16	10.12	Normal
8	HRH Temp Right	515.33	521.87	Normal	8	Oil Pressure	10.16	10.12	Normal
9	Max SH Metal Temp	559.25	560.02	Normal	9	Oil Temp	10.16	10.12	Normal
10	Max RH Metal Temp	566.08	566.02	Normal	10	CW Inlet temp	29.65	29.70	Normal
11	Total SH Spray	55.28	55.68	Normal	11	Condensate DO	6.78	6.63	Normal
12	Total RH Spray	21.01	20.70	Normal	12	Condensate ACC	0.13	0.13	Normal
13	APH Exit Gas Temp	139.20	139.75	Normal	13	DM Make-up*(08Hr/01Day)	11.96	10.93	Alert
14	Hot Sec Air Temp	352.21	352.76	Normal	14	Seal Steam Pressure	358.60	346.94	Normal
15	Hot Pri Air Temp	306.46	306.41	Normal					
16	Any Fan Not I/S	All In Service		Normal					
17	Seal Stm Hdr Temp	287.92	287.19	Normal					
GENERATOR									
1	Primary Water Cond	2.47	2.47	Normal	4	Excitor Hot Air Temp	49.53	49.33	Normal
2	H2 Pressure	3.52	3.52	Normal	5	Seal Oil DP H2S (TE)	2.30	2.28	Normal
3	Seal Oil Temp	31.72	31.68	Normal	6	Seal Oil DP H2S (EE)	2.43	2.42	Normal

Case Study – NTPC Critical Parameters Monitoring

Current Value
 Archive Value
 Single Value

Compressed Data
 Sampled Data
 Timed Data
 Multiple Value

Calculated Data
 Time Filtered
 Calculation

Search
 Search
 Search

Properties
 Properties
 Properties

Update
 Update
 Update

Settings
 About
 Help
 Resources

Notification Search
 Notifications



D7 : X ✓ fx []

CRITICAL CONTROL POINT PERFORMANCE													
Filter		Date From		Date To		Data Last Updated							
Month / Year		01/07/2010		31/07/2010		21/09/2010 12:40							
		31 day period											
District/Locality	% Hours Recorded	Critical Limit - % Good			Target Limit - % Good			# Alarms	Critical Alarms		Target Alarms		Last Refresh
CCP		In Band	Low	High	In Band	Low	High		Low	High	Low	High	
SWR													
▼ Bunbury													
Australind													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	G 85.8	G 96.6	G 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7		G 98.7	G 0		G 0			21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
Boyanup													
Chlorine_Residual_Inlet	R 31.1	O 98.2	O 99.5	O 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7		R 98.7	G 0		G 0			21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
Collie													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	G 85.8	G 96.6	G 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7			G 0					21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	O 88.7		N/A			G 0	G 0				21/09/2010 12:40
Darkan													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7			G 0					21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
► Busselton													
▼ Mandurah													
Dwellingup													
Chlorine_Residual_Inlet	R 31.1	G 98.2	G 99.5	G 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7			G 0					21/09/2010 12:40
UV_Dose	R 31.1	R 88.7	G 88.7		N/A			G 0	G 0				21/09/2010 12:40
Mandurah													
Chlorine_Residual_Inlet	R 31.1	O 98.2	O 99.5	O 98.7	R 85.9	O 96.6	R 88.4	G 0	G 0	G 0	G 0	G 0	21/09/2010 12:40
Turbidity	R 31.1	G 100.0	G 100.0	G 100.0	O 98.7			G 0					21/09/2010 12:40

Case Study – Water Corporation of Western Australia

Critical Control Point Performance

<

>

Home

GSR

IMS_Trial

NWR

SWR

Thresholds

+

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Case Study – Water Corporation of Western Australia

Critical Control Point Performance

PI DataLink 2013 & Microsoft Excel 2013

- **PI DataLink 2013**
 - **PI AF** support with the new **PI System Search** engine
- **Microsoft Excel 2013**
 - Business Intelligence (BI) tools are integrated
 - Microsoft **PowerPivot**
 - Microsoft **Power View**

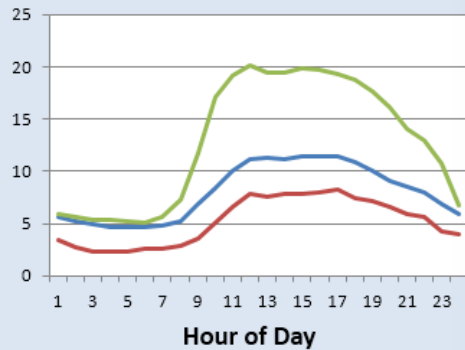


Demand Profiling and Grid Analysis



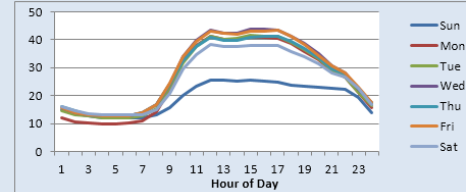
Substation

Feeder Distribution, kWh

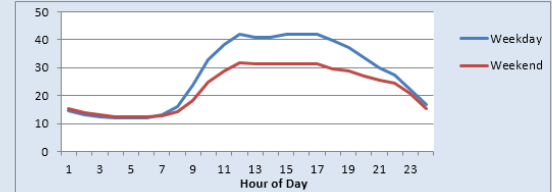


Feeder and Pole Transformer Analysis

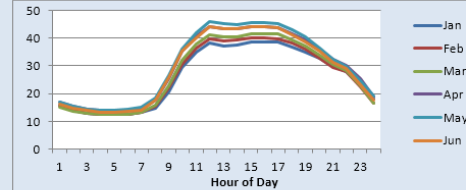
Weekday Profiles, kWh



Weekday \ Weekend Profiles, kWh



Monthly Profiles, kWh



Pole Loads at Peak (9 am - 4 pm), kWh

	Jan KWH	Feb KWH	Mar KWH	Apr KWH	May KWH	Jun KWH
PT0398	4.4	4.5	5.0	5.3	5.5	5.5
PT1324	3.5	3.6	3.5	4.0	4.1	4.2
PT2235	3.4	3.9	4.1	4.5	4.7	3.1
PT4537	2.8	3.2	3.3	3.7	3.8	3.7
PT7465	3.1	3.2	3.5	3.8	3.9	4.0
PT7745	3.2	3.2	3.1	3.3	3.6	4.3
PT8356	10.6	11.0	11.0	11.7	12.1	11.7
PT8461	3.3	3.3	3.6	3.8	3.8	3.5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

3 **Feeder Circuit** ▼

5 FD1209

6 FD2349

FD4602

10 Pol-Turf ▼

PT0398

PT1324

14 PT2235

15 PT4537

17	PT7465
----	--------

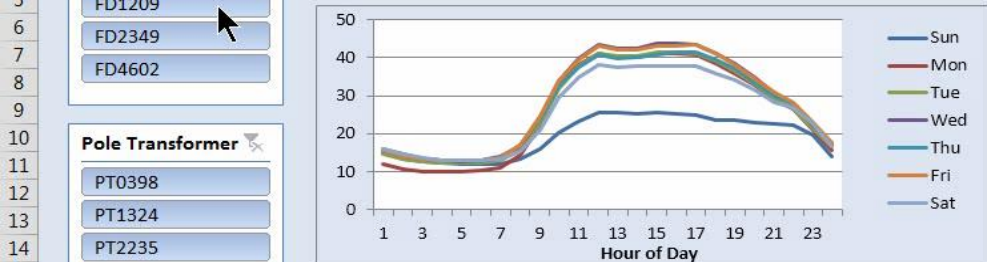
PT7745

20	PT8356
----	--------

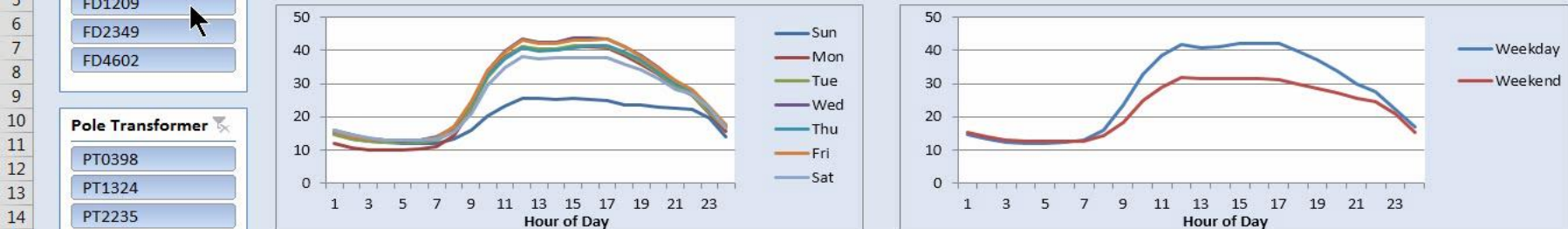
21	PT8461
----	--------

22

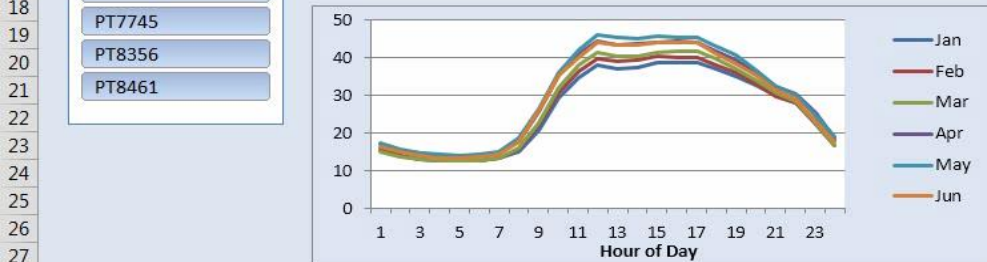
Feeder Circuit	W. L. L. P. S. L. W. L.
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
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31	31
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75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100



Feeder Circuit	W	L	D	SL	LWL	W	L	D	SL	LWL
----------------	---	---	---	----	-----	---	---	---	----	-----



15 PT4537

[illegible]

	Jan	Feb	Mar	Apr	May	Jun
	KWH	KWH	KWH	KWH	KWH	KWH
PT0398	4.4	4.5	5.0	5.3	5.5	5.5
PT1324	3.5	3.6	3.5	4.0	4.1	4.2
PT2235	3.4	3.9	4.1	4.5	4.7	3.1
PT4537	2.8	3.2	3.3	3.7	3.8	3.7
PT7465	3.1	3.2	3.5	3.8	3.9	4.0
PT7745	3.2	3.2	3.1	3.3	3.6	4.3
PT8356	10.6	11.0	11.0	11.7	12.1	11.7
PT8461	3.3	3.3	3.6	3.8	3.8	3.5

PI Coresight

Explore

Report

Collaborate

Share

Collect

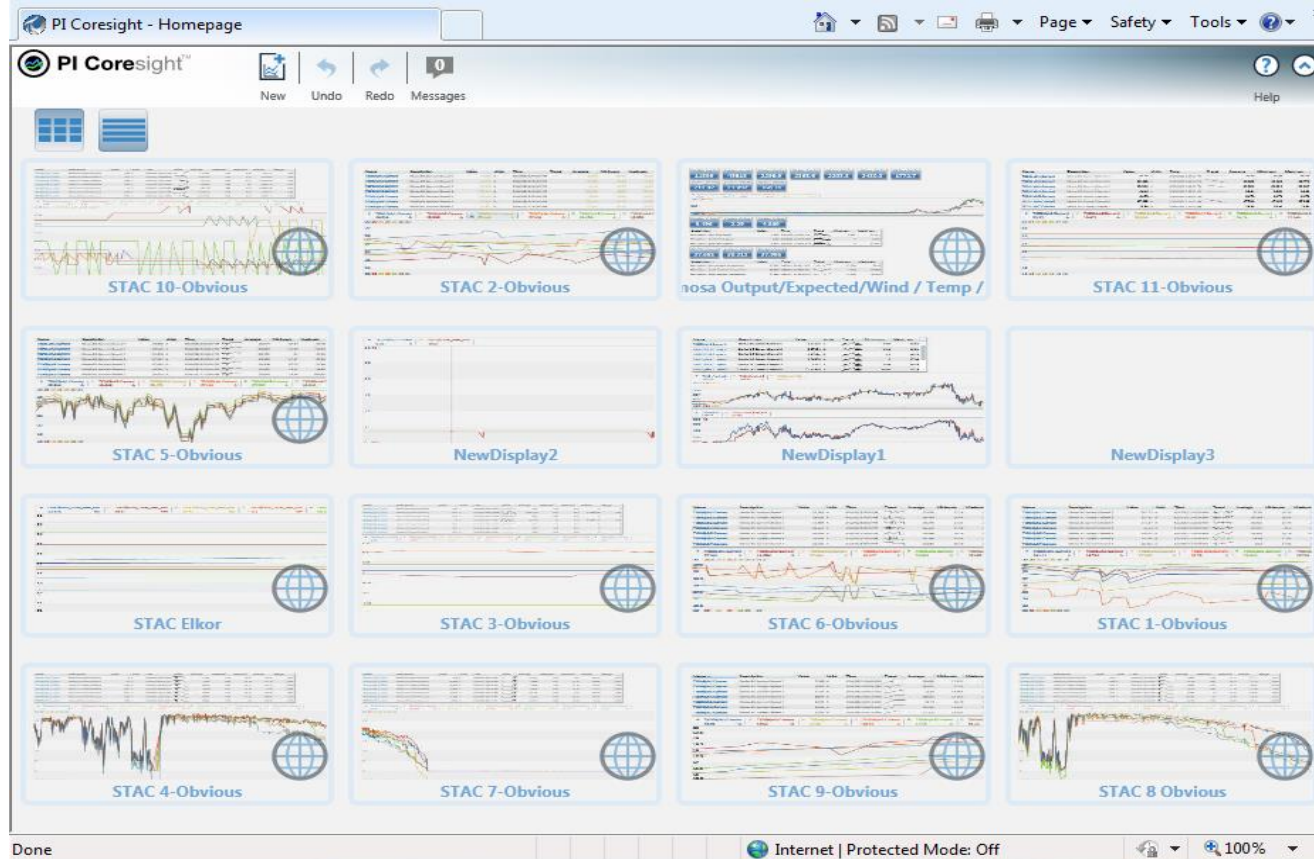
- **Modern** Web based visualization tool
- Facilitates **ad hoc** analysis
- **Instantaneous** learning
- Software with a **fast release cycle** to fit your needs
- **No client-side** installation



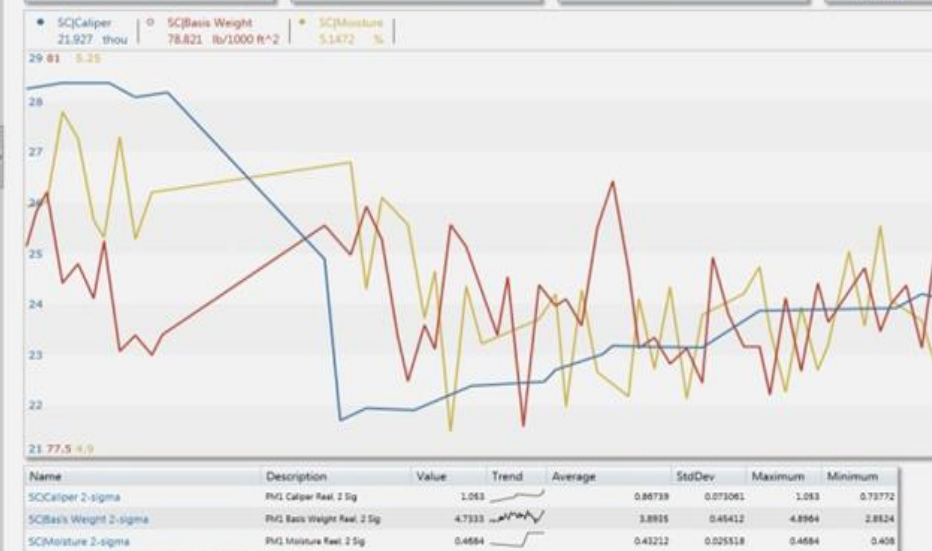
Benefits of PI Coresight at AMONIX™

POWERING THE FUTURE NOW™

- **Minimal learning curve**
- **Rapid trend analysis**
- **Leveraging PI AF structure and data**

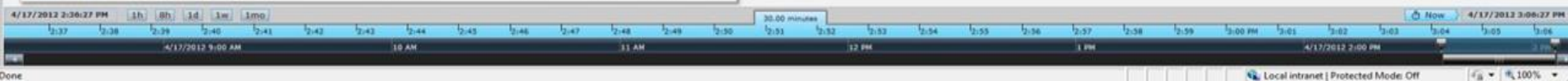


RockTenn Insight for Operators



“Operators are afraid of full blown PC Applications, PI Coresight will give them easy to use ad hoc capabilities.”

— Matt Corcoran, RockTenn



Visualization and Mobility



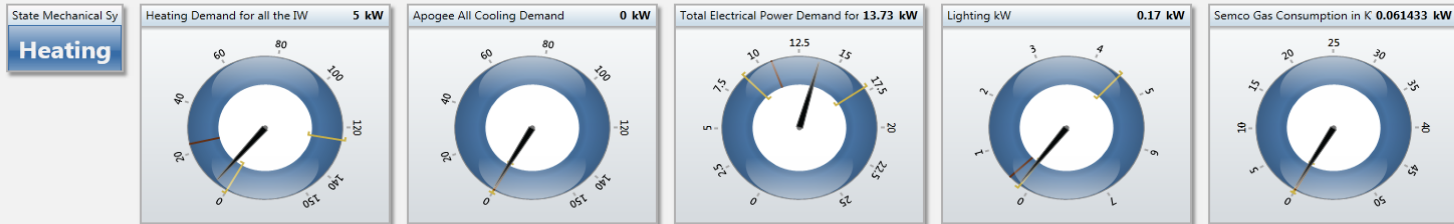
Your needs are evolving:

- **Remote** access
- Access at **any time**
- **Self-service** usage

Mobility and the PI System

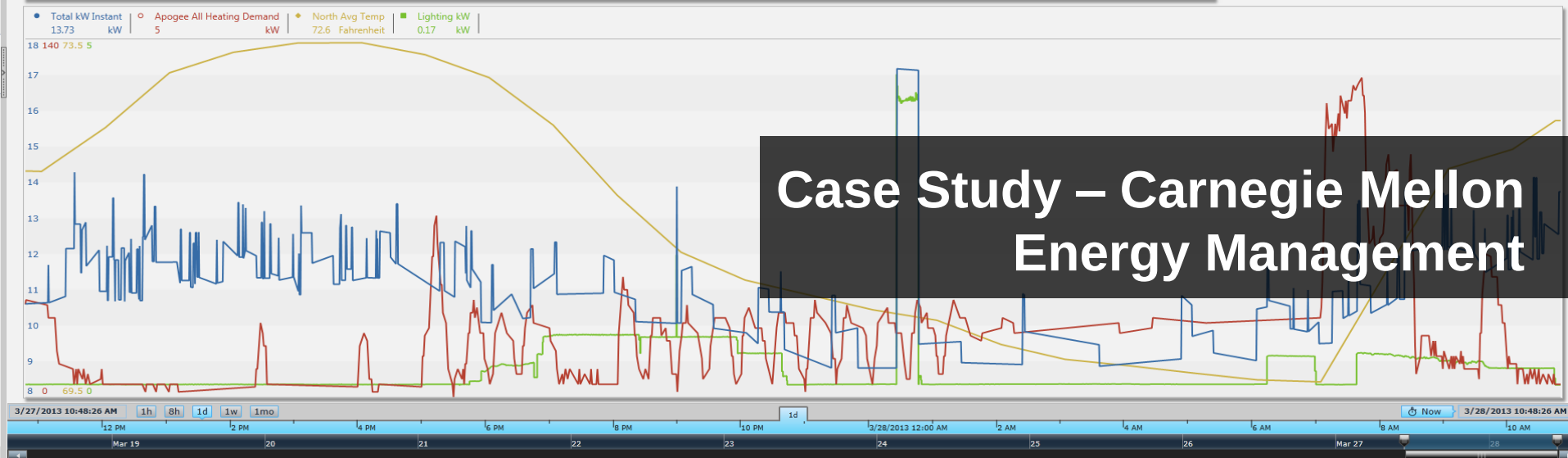
- Mobile **PI Coresight** application for the **iPad** and the **iPhone** now available!
 - Native application
 - Free download on the Apple App Store™
 - Test it now with **sample data**



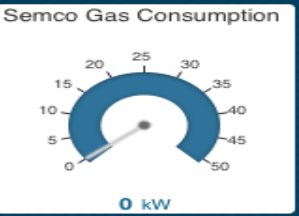
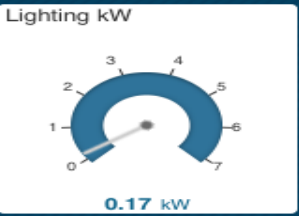
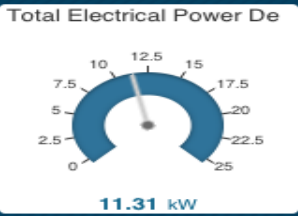
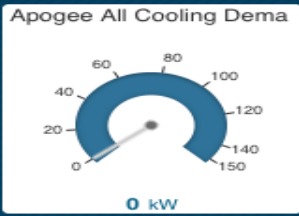
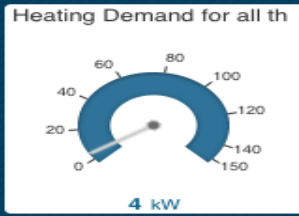


Name	Description	Value	Units	Trend	Average	Minimum	Maximum	StdDev	Range
Apogee All Heating Demand	Heating Demand for all the IW	5	kW		23.64	0	125	21.44	125
Total kW Instant	Total Electrical Power Demand for all IW	13.73	kW		10.77	8.812	17.18	1.402	8.365

Name	Description	Value	Units	Trend	Average	Minimum	Maximum	StdDev	Range
North Avg Temp	North Average Temperature	72.6	Fahrenheit		71.5	69.7	73.5	1.34	3.79
North IW/North Avg Ill	North Average Illuminance	857.8	Lux		336.3	0	1,469	461.7	1,469

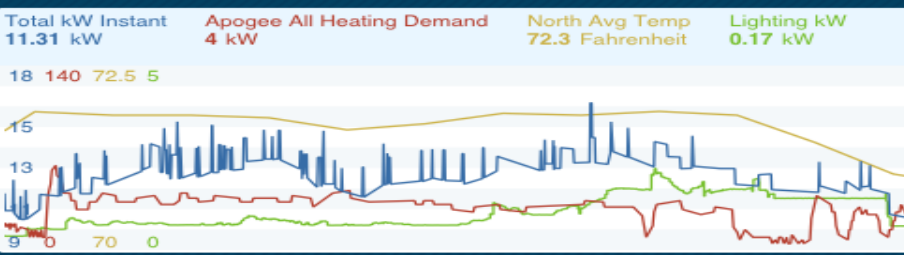


State Mechanical System
Heating



Name ▲	Description	Value	Units	Trend	Average	Minimum	Maximum
Apogee All Heating Demand	Heating Demand for all the IW	4	kW		28.82	2	124
Total kW Instant	Total Electrical Power Demand for all IW	11.31	kW		11.38	9.497	17.95

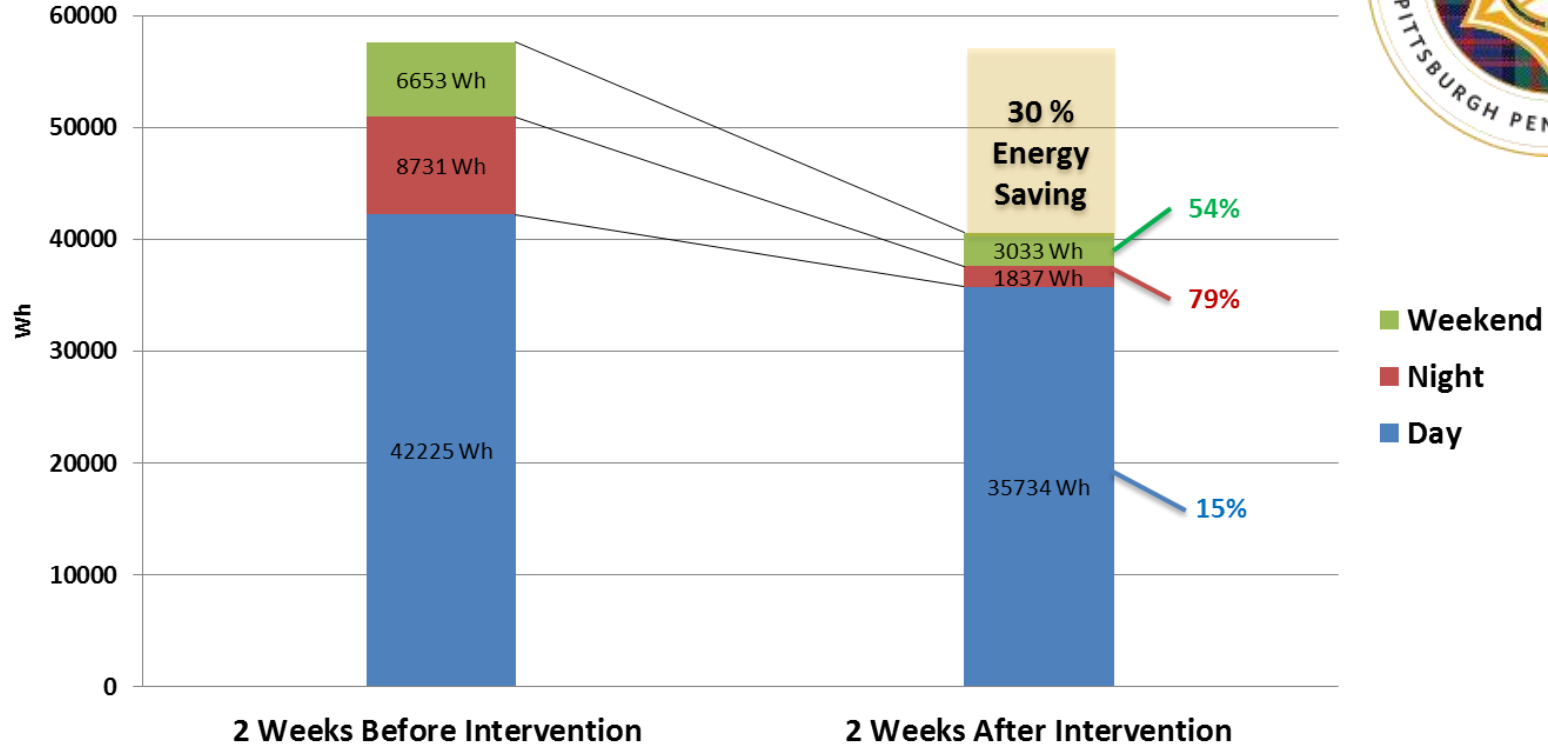
Description ▼	Value	Units	Trend	Average	Minimum	Maximum	StdDev
North Average Temperature	72.3	Fahrenheit		71.2	70.1	72.3	0.622
Daylight Level Apogee	1,418	Lux		12.36	1.500	226.57	



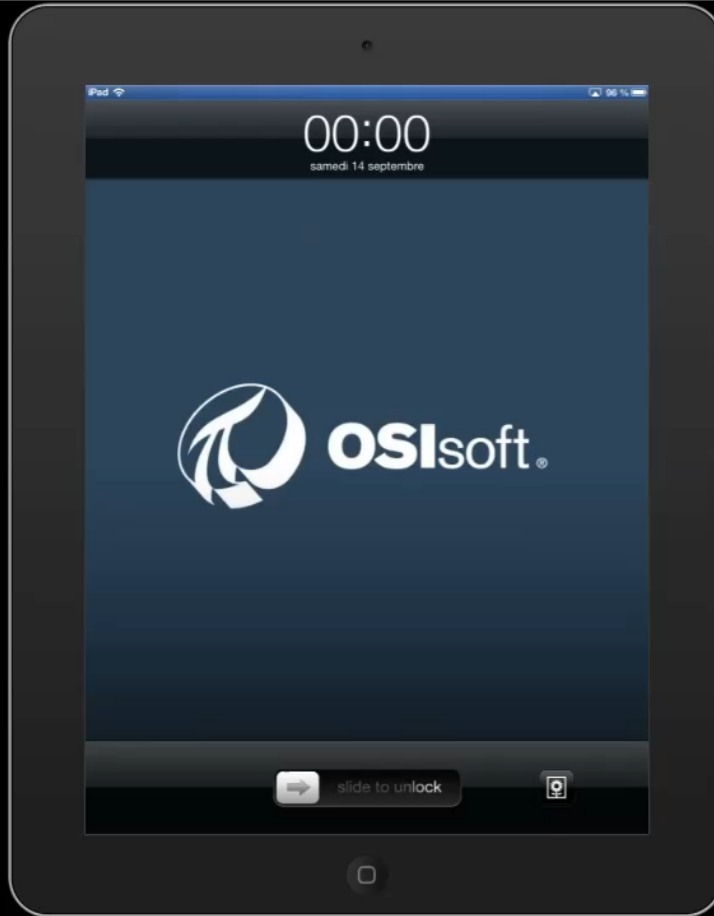
Case Study – Carnegie Mellon Energy Management

Case Study – Energy Management

Energy Savings (CFA n=7)



Support for iPad and iPhone



Support the Devices you Use

How can you tell now what every team member
will use...

tomorrow...

next week...

especially next year!



Collect Data with Different Devices

PI Manual Logger

TOURS

Back

Apr 09 2013 - 12:34:14 pm
1 / 8 tags

Pump P250 Temp
South Reflux Pump 1 Pump1

Instructions
Use the vibration probe to measure the Temperature for Pump P250.

Value
190
Limits violated: Hi(185)
H:185 L:155
Previous value: 184 - Apr 09 2013 - 12:34:14 pm
> more values

Timestamp
Apr 09 2013 - 12:34:14 pm

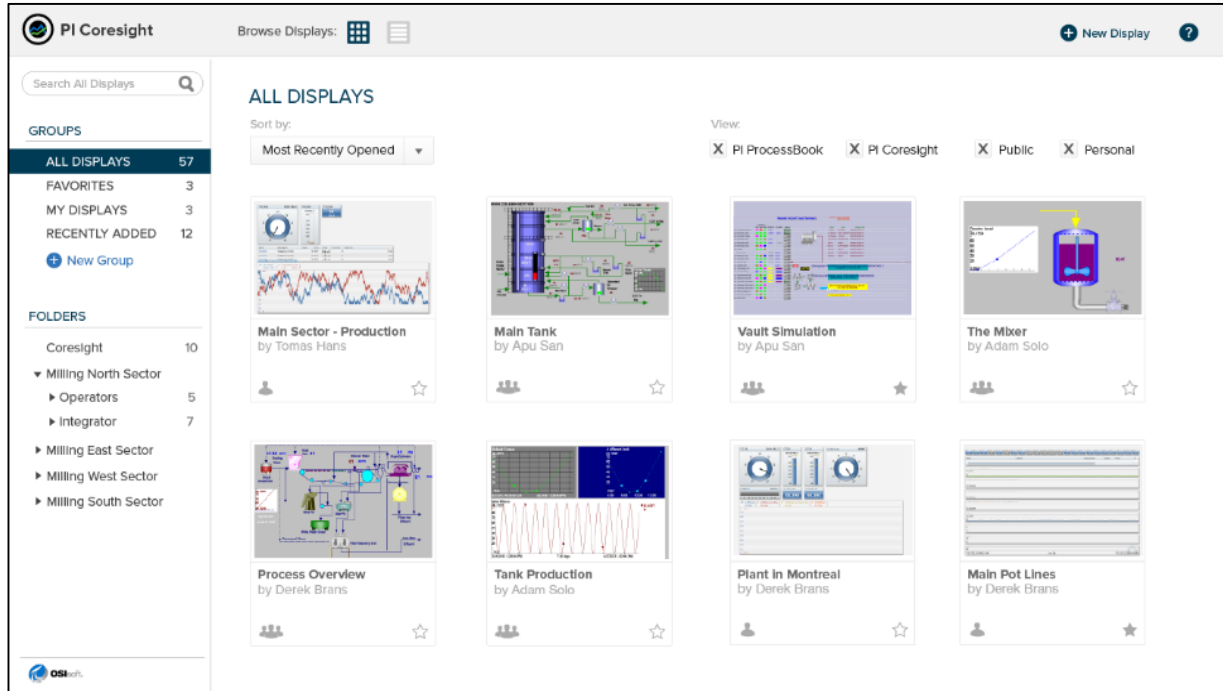
Comment

Next / Prev All Missing

- Browser interface is device agnostic
- Simplified screen
- Android phone & tablet
- iPhone and iPad
- Any modern browser (HTML5 support)



View PI ProcessBook Content on Different Devices

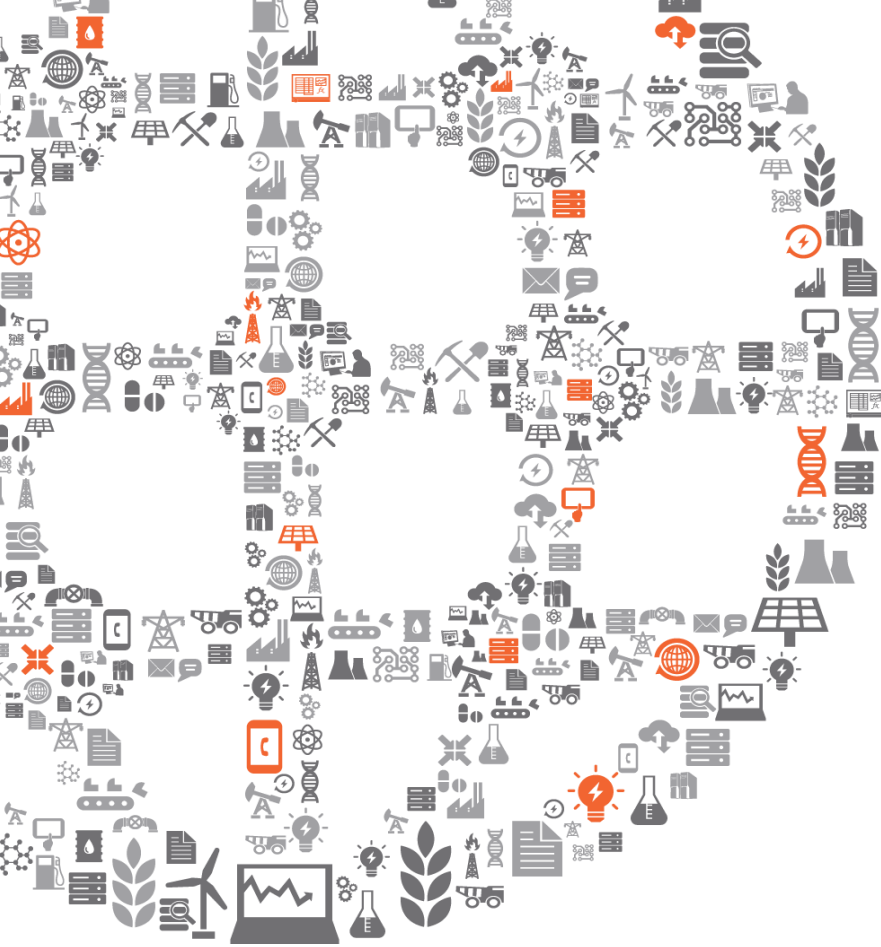


- **Browse PI ProcessBook displays** the same way as PI Coresight
- Any modern browser (**HTML5** support)

PI Visualization Suite Benefits

- Access to the data in the format you want **reduces the time to insight**
- Access to the data when and where you want **facilitates collaboration and sharing of insights**
- **All** visualization tools to **any** user gives **the right tool** for the job **at the right time**





Questions

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



State your
**name &
company**



Operational Insights Enterprise Wide



**THANK
YOU**

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Sr. Field Engineer

OSIsoft