

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

**THRIVING
IN A
WORLD OF
CHANGE**



Gaining and Sharing Insights Across the Enterprise from Anywhere

Presented by **Martin Bryant**, Staff Field Service Engineer



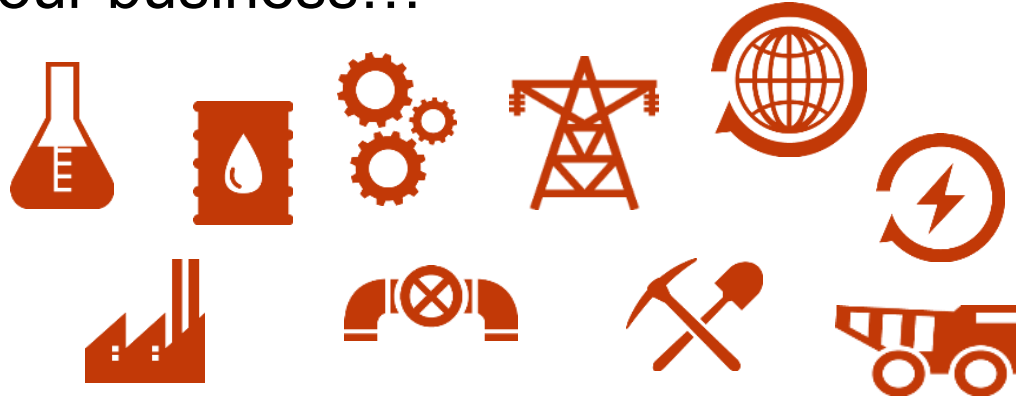
Data-driven Decisions

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**?

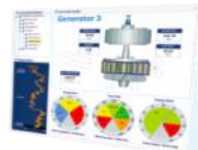


Any Data, Anytime, Anywhere

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

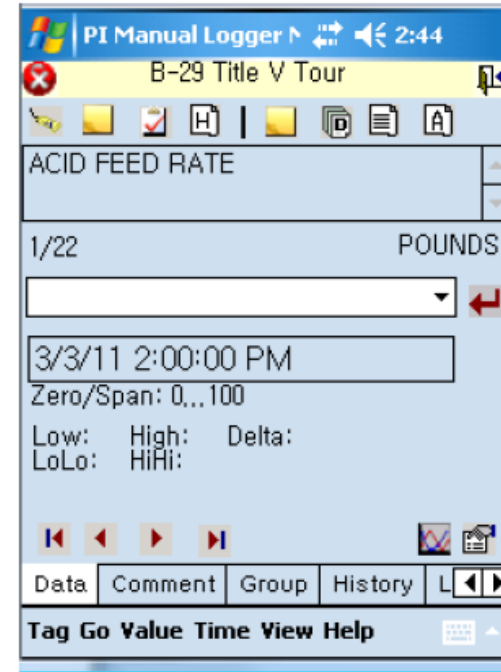
Collaborate

Share

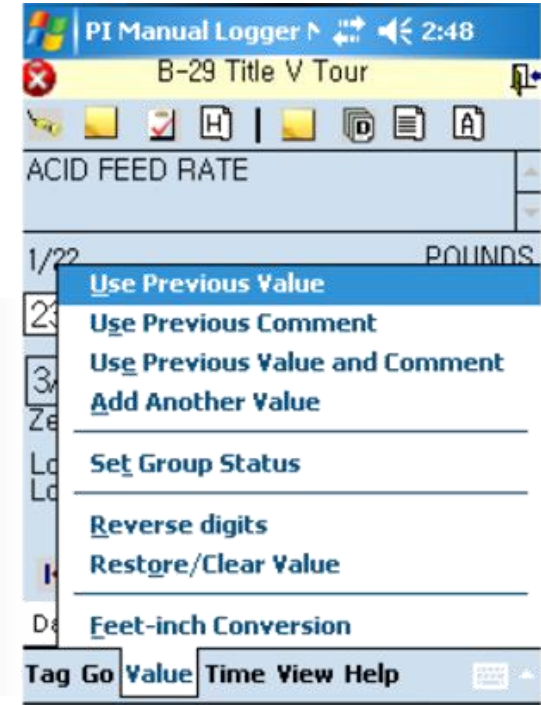
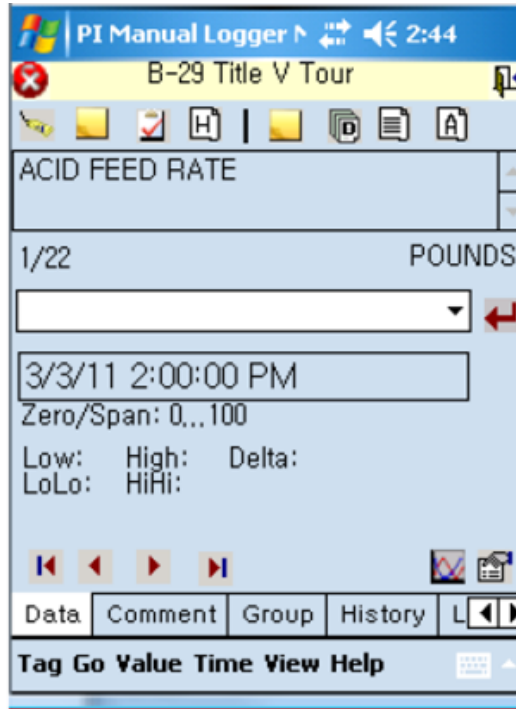
Review

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+ More+ Move to: ? To Manager Team Email 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

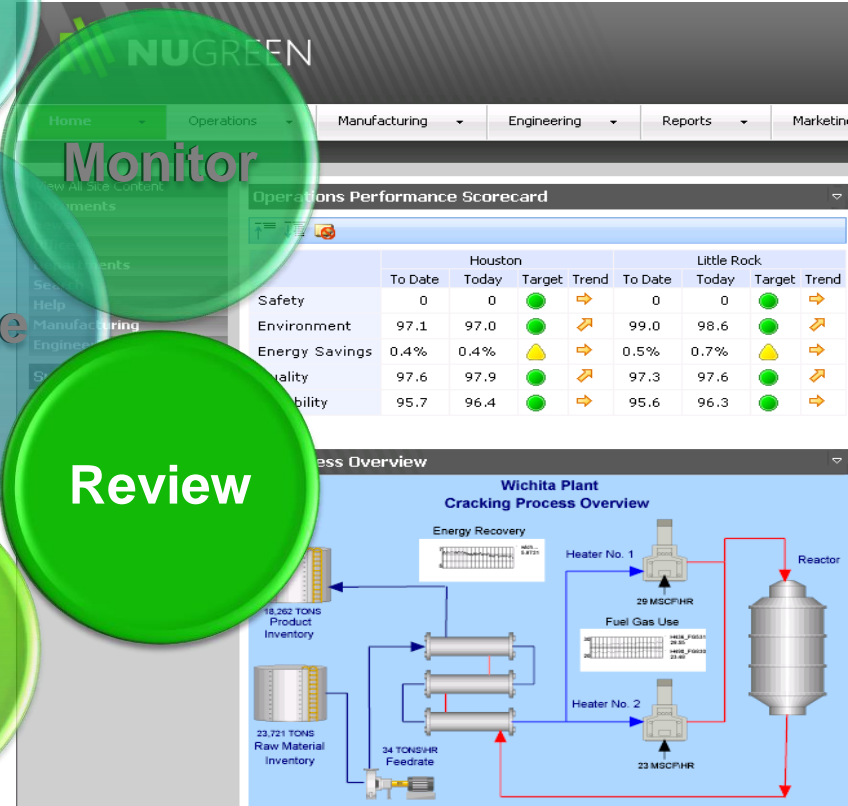
Collaborate

Share

Review

Collect

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





Sandbox

EDIT LINKS

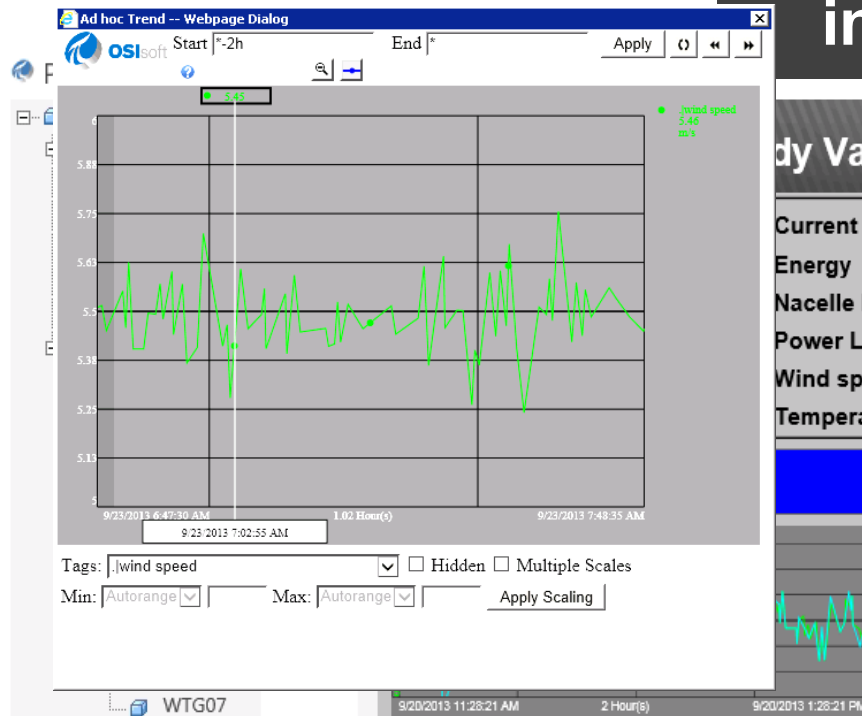
NuGreen Energy

Home

Documents

Site Contents

EDIT LINKS

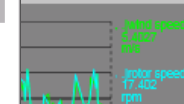
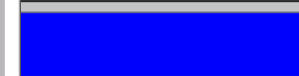


PI ProcessBook Displays in Microsoft SharePoint

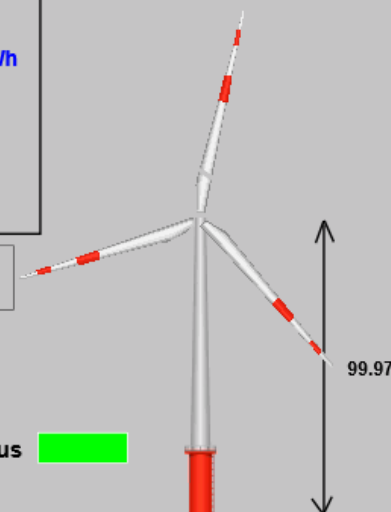
dy Valley WTG01

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






































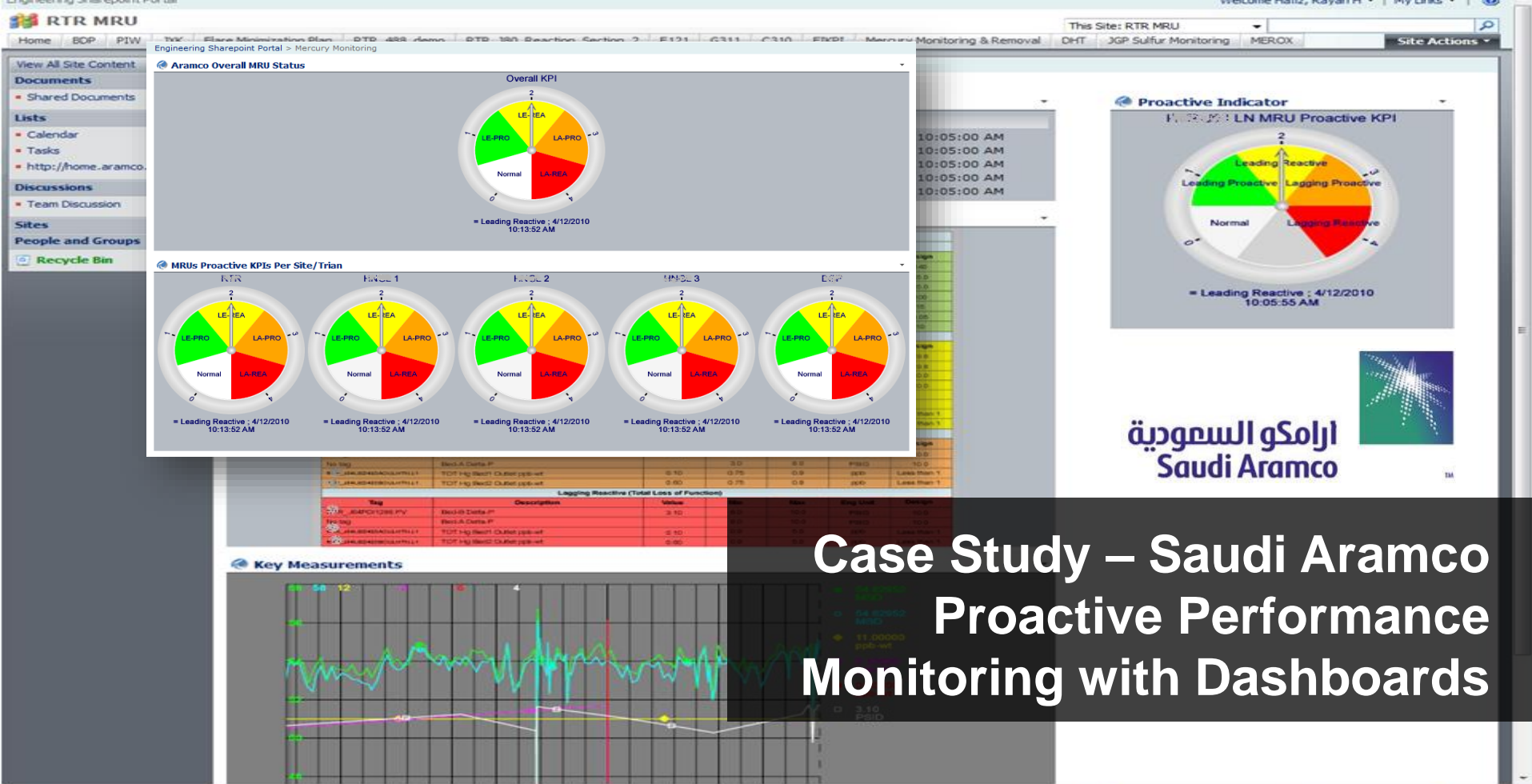
PI DataLink Reports in Microsoft SharePoint

Site Contents

 EDIT LINKS

Excel Web Access - Wind Turbines Daily Report RS2013 DLES

FILE	OPEN IN EXCEL	DATA	FIND						
	A	B	C	D	E	F	G	H	
1			Wind Turbines Daily Report						
2									
3	From	Wind Farm		Windy Valley		Wind Turbine		WTG01	
4	September 22, 2013	Turbine				Environmental Conditions			
5	To	Model		1.5s		Wind Speed		5.53 m/s	
6	September 23, 2013	Nominal Power		1.5 MW		Outside Temperature			
8		Energy	Rotor Speed	Nacelle Position	Current L1	Previous Values			
9		kWh	rpm	°	kA	Wind Speed	Outside Temperature		
10									
11	12:00 AM		905.73 	17.50 	163.34	360.14	5.42		14.98
12	1:00 AM		905.29 	17.50 	164.28	360.05	5.50		15.03
13	2:00 AM		905.70 	17.51 	144.69	360.13	5.45		15.09
14	3:00 AM		906.06 	17.51 	161.13	360.17	5.40		15.14
15	4:00 AM		907.02 	17.52 	225.30	360.37	5.56		15.20
16	5:00 AM		905.36 	17.50 	158.31	360.07	5.38		15.24
17	6:00 AM		906.21	17.51 	138.86	360.22	5.50		15.23



Case Study – Saudi Aramco Proactive Performance Monitoring with Dashboards

Proactive Performance Monitoring with Dashboards

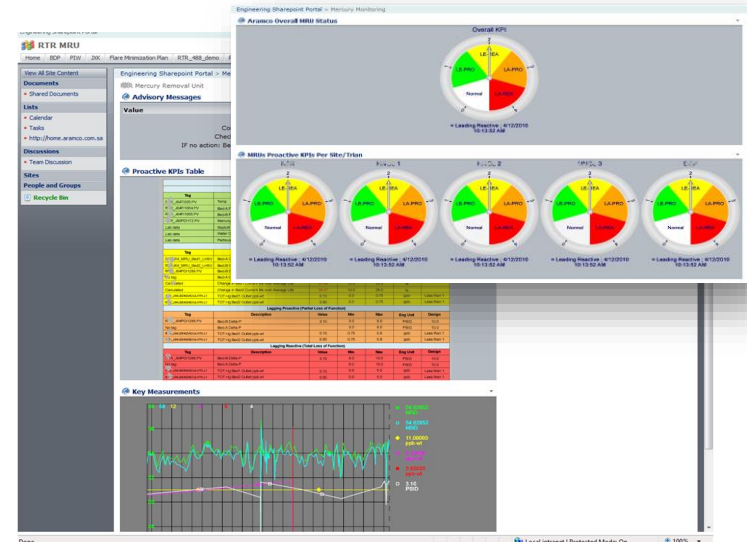
Saudi Aramco needed a proactive solution to monitor and improve performance. After implementing **PI WebParts**, the impact on **performance improvement** meant multiple millions of dollars in additional revenue.

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

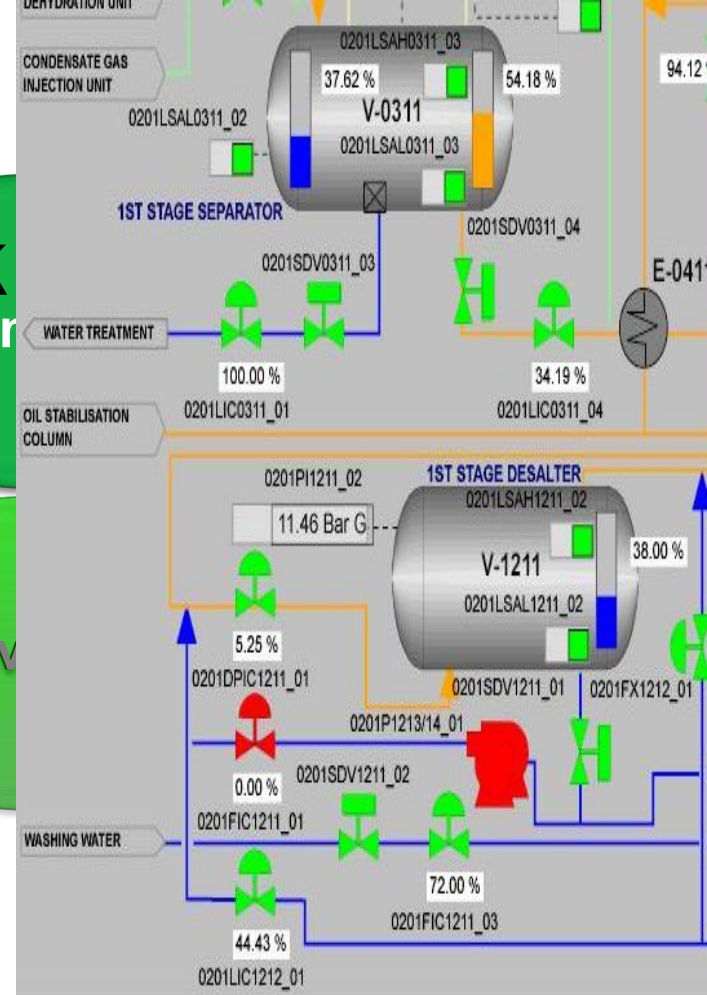
Collaborate

Review

Share

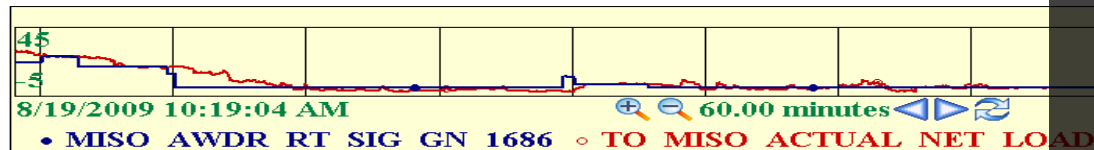
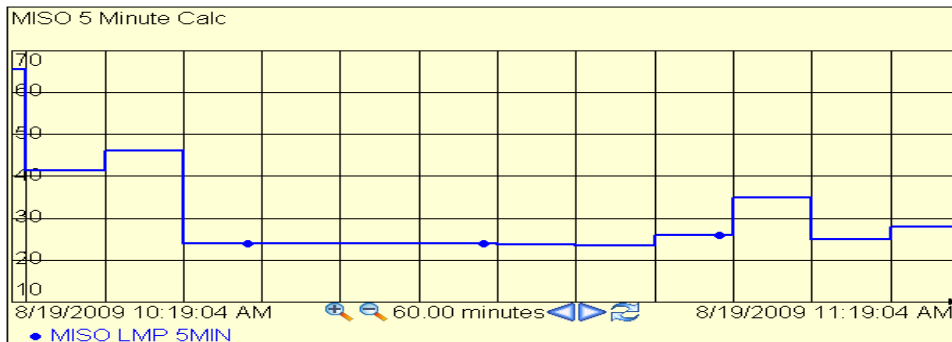
Collect

- Display of **real-time and historical data**
 - Process representation
 - **Trend** with traces
 - Context management with PIAF
- 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	<div><div></div></div>	91.3
OCB 1502	<div><div></div></div>	90.8
OCB 1503	<div><div></div></div>	92.8
OCB 1504	<div><div></div></div>	90.4
GCS 3805	<div><div></div></div>	00.0
GCS 3806	<div><div></div></div>	90.0
GCS 3800	<div><div></div></div>	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

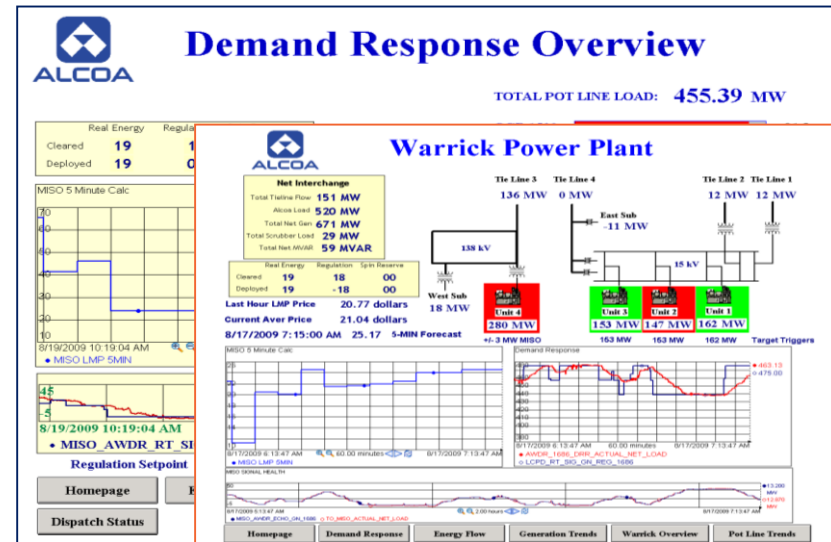
Pot Line Trends

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

- 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							
17	Seal Stm Hdr Temp	287.92	287.19	Normal					
18									
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

D7

CRITICAL CONTROL POINT PERFORMANCE

Filter: Month / Year Date From: 01/07/2010 Date To: 31/07/2010 31 day period Data Last Updated: 21/09/2010 12:40

District/Locality CCP	% Hours Recorded	Critical Limit - % Good			Target Limit - % Good			# Alarms	Critical Alarms		Target Alarms		Last Refresh
		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 85.9	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 85.9	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 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
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 98.7	G 0		G 0			21/09/2010 12:40

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**

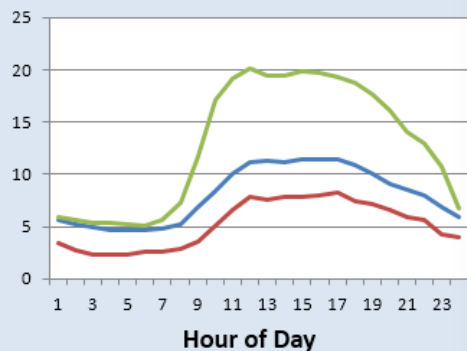


Demand Profiling and Grid Analysis



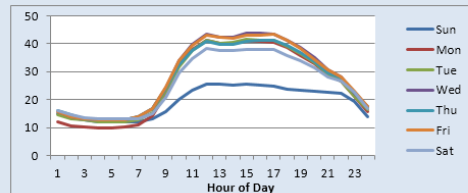
Substation

Feeder Distribution, kWh

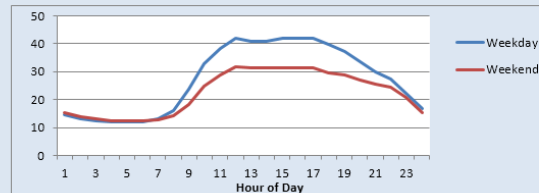


Feeder and Pole Transformer Analysis

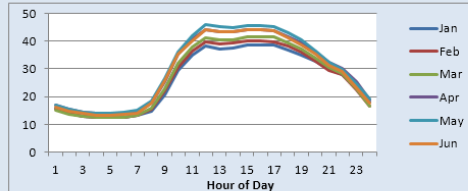
Weekday Profiles, kWh



Weekday \ Weekend Profiles, kWh



Monthly Profiles, kWh



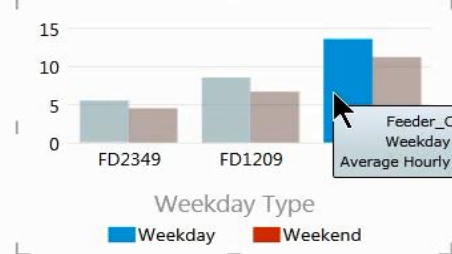
Pole Loads at Peak (9 am - 4 pm), kWh

	Jan	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

Bighorn Basin Substation Service Area

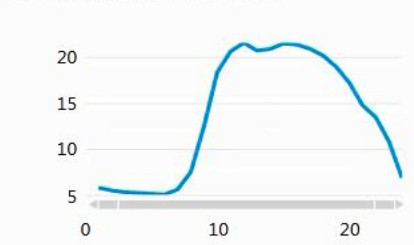
Circuit Drilldown

sort by Average Hourly KWH asc



Feeder_Circuit: FD4602
Weekday Type: Weekday
Average Hourly KWH: 13.5

Distribution Profile



Service Profile



Area Meters

Service

- Agricultural
- Commercial
- Industrial
- Residential



PI Coresight Explore

- **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**

Report

Collaborate

Share

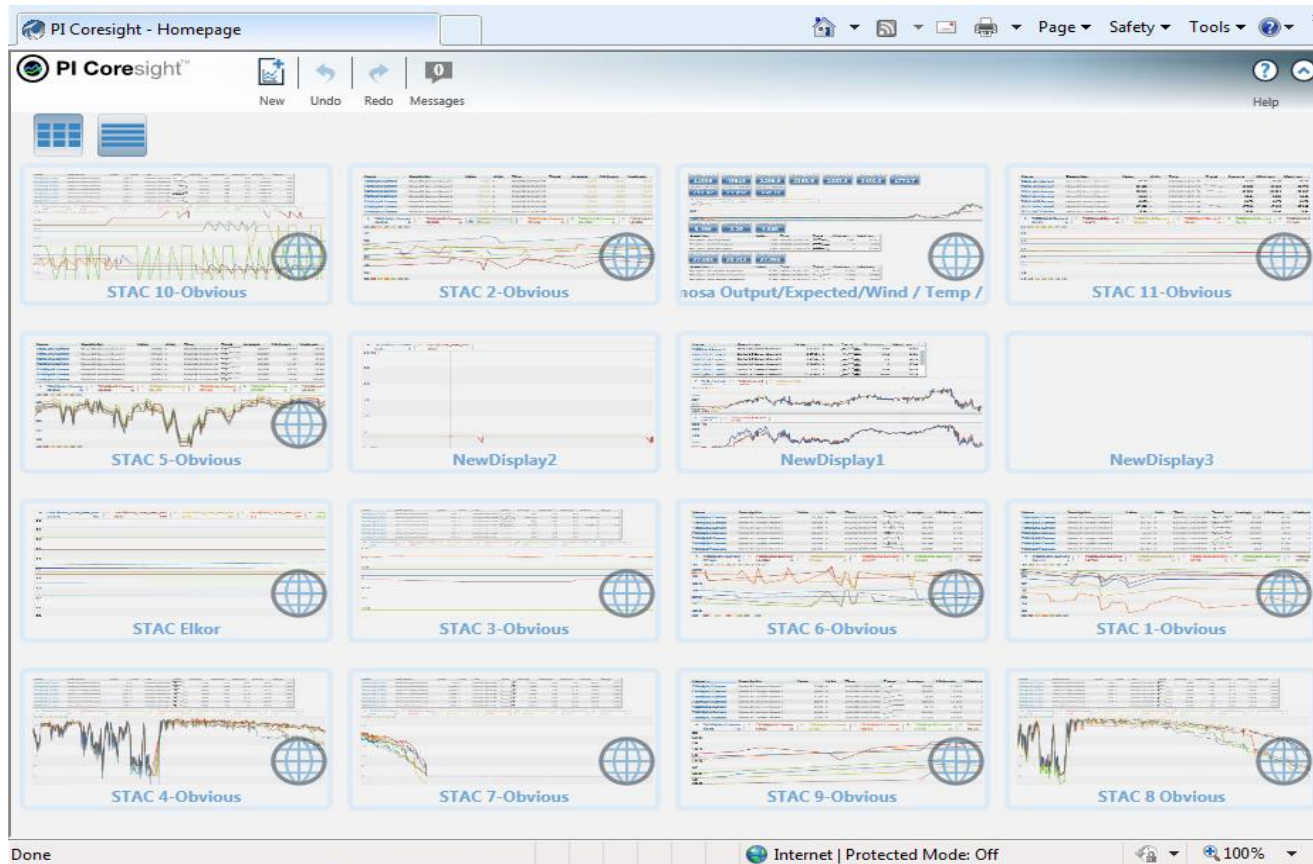
Collect



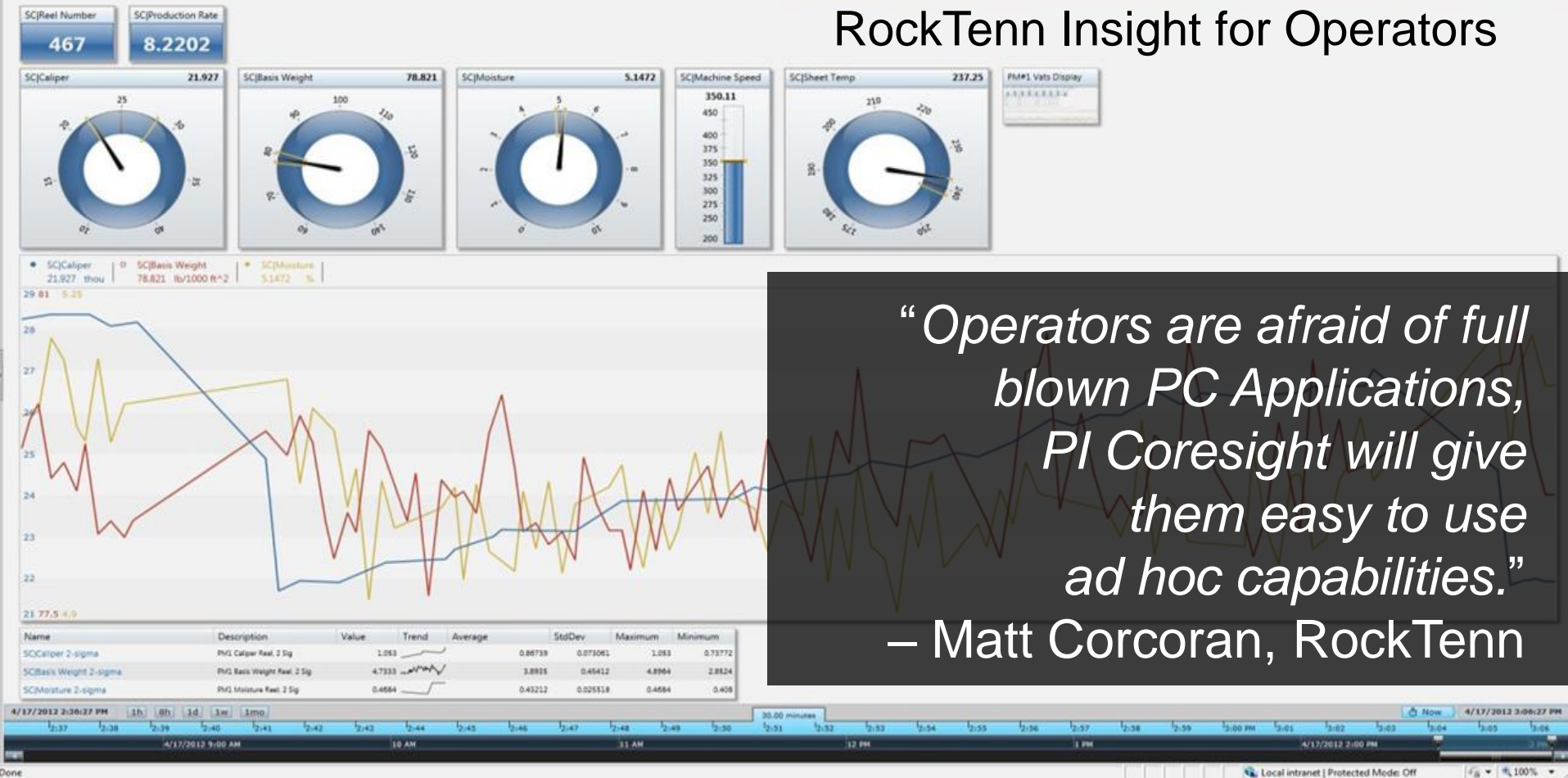
Benefits of PI Coresight at AMONIX™

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



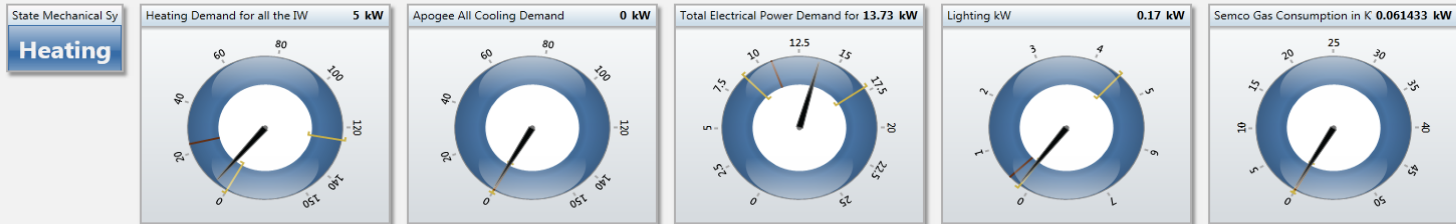
Your needs are evolving:

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

Mobility and the PI System

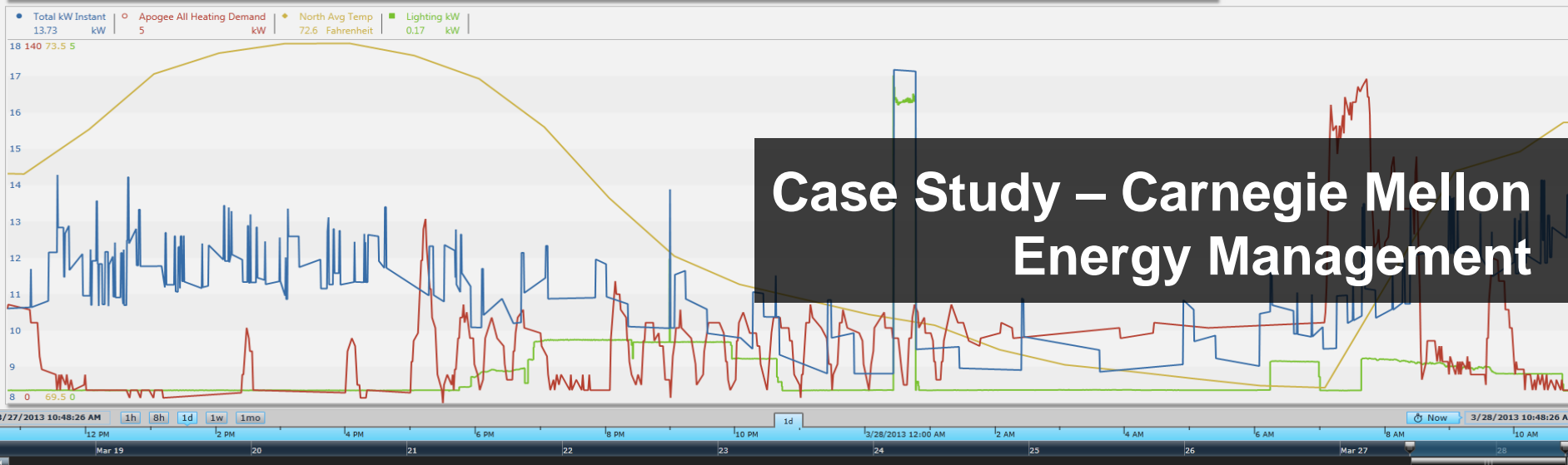
- Mobile **PI Coresight** application for the **iPad** and the **iPhone** now available!
 - Native application
 - Free download on the Apple App Store™
 - Test it now with **sample data**



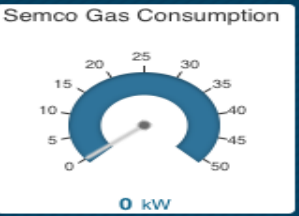
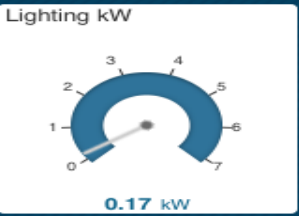
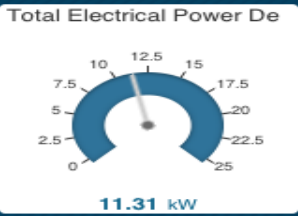
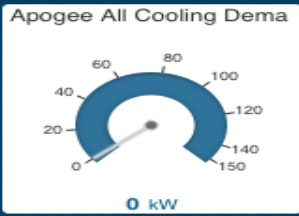
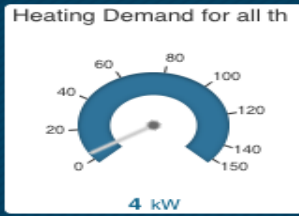


Name	Description	Value	Units	Trend	Average	Minimum	Maximum	StdDev	Range
Apogee All Heating Demand	Heating Demand for all the IW	5	kW		23.64	0	125	21.44	125
Total kW Instant	Total Electrical Power Demand for all IW	13.73	kW		10.77	8.812	17.18	1.402	8.365

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

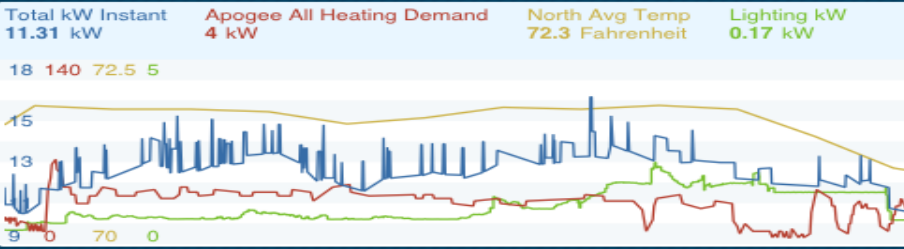


State Mechanical System
Heating



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

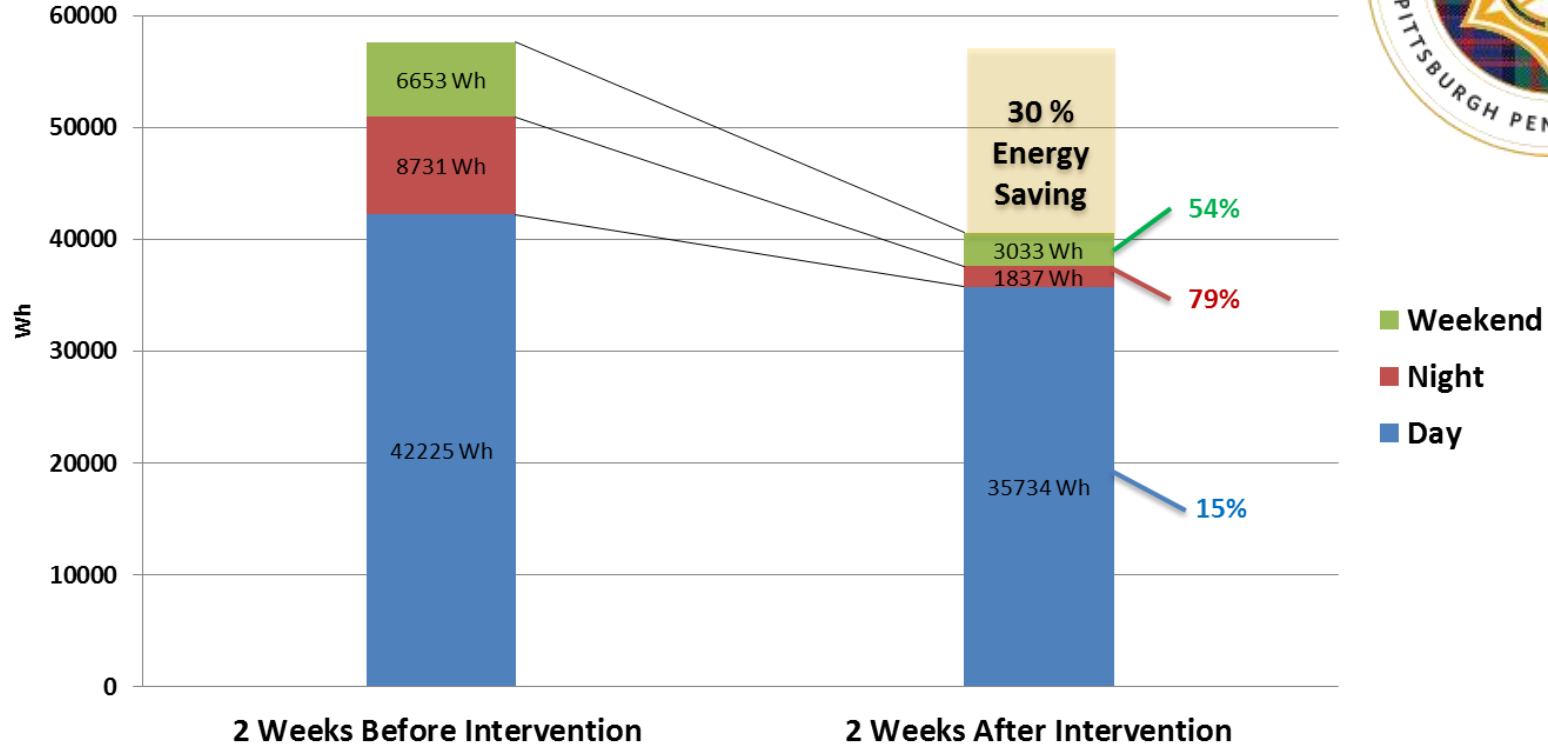
Description ▼	Value	Units	Trend	Average	Minimum	Maximum	StdDev
North Average Temperature	72.3	Fahrenheit		71.2	70.1	72.3	0.622
Daylight Level Apogee	1,418	Lux		12.36	1.500	226.57	



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 \ 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

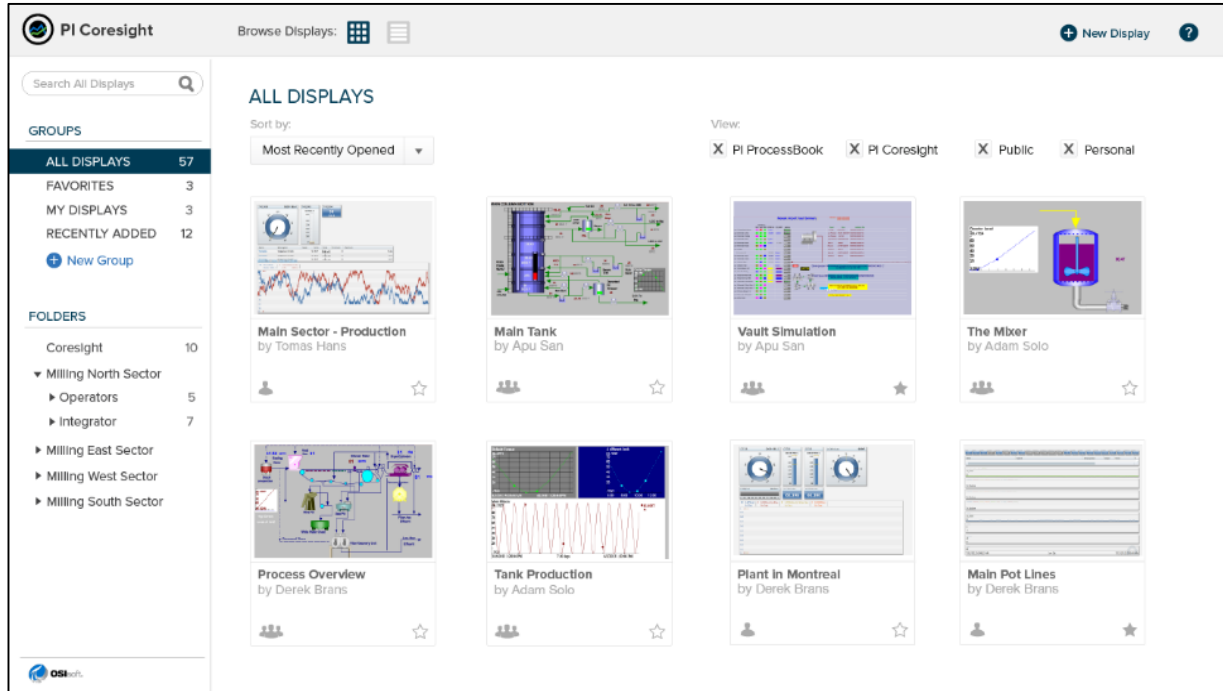
Comment

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

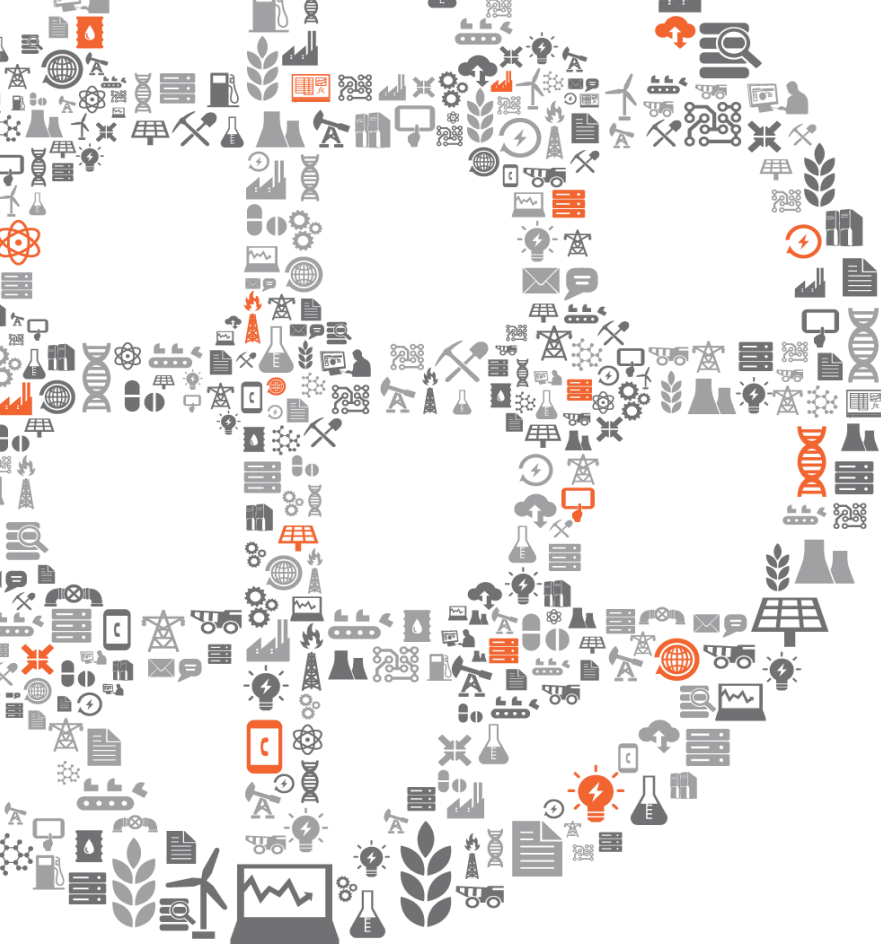


- **Browse PI ProcessBook displays** the same way as PI Coresight
- Any modern browser (**HTML5** support)

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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