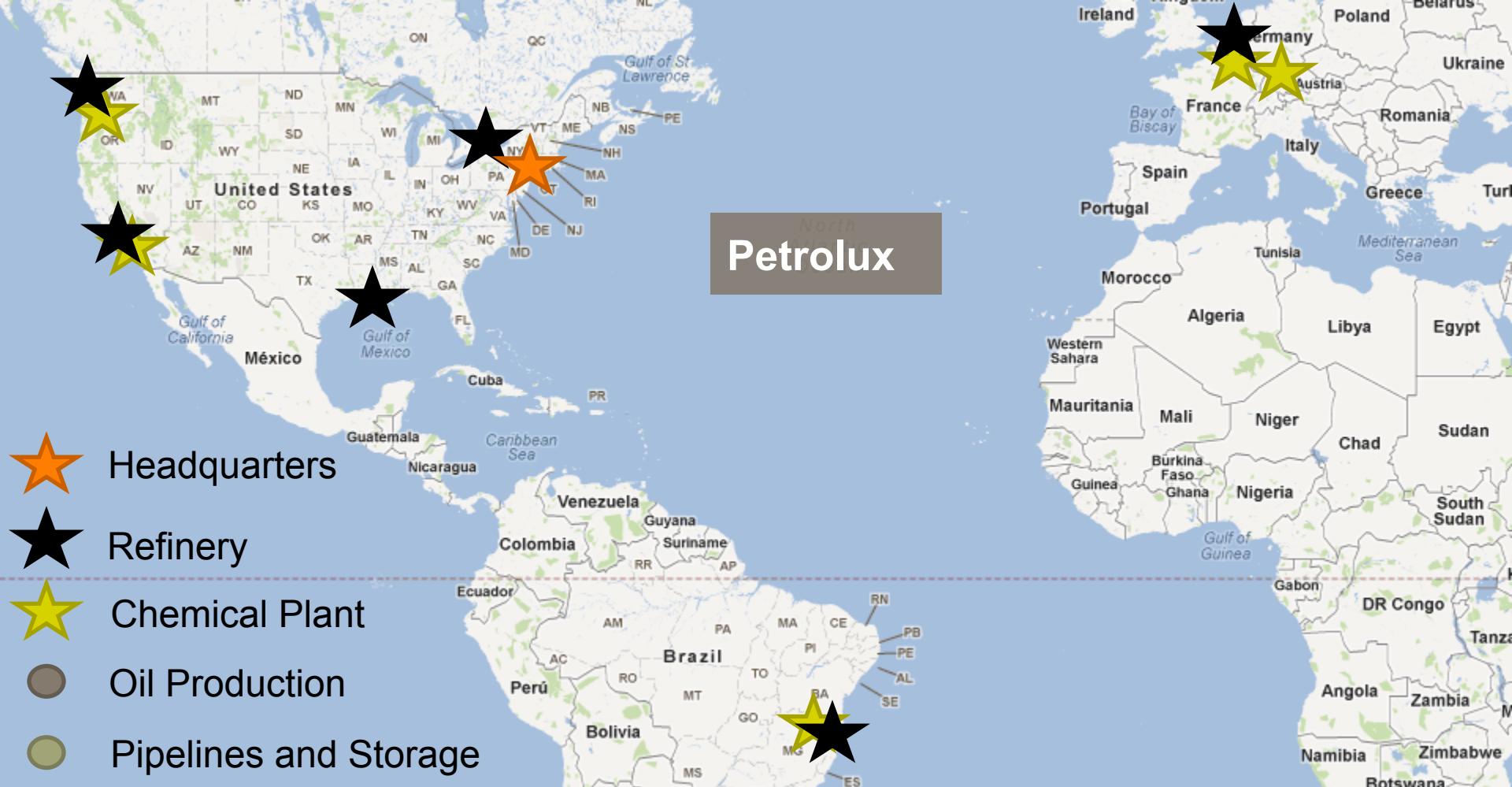




# The PI System in 2012

Presented by **Brian Bostwick and Ray Hall**





Anacortes

- ★ Headquarters
- ★ Refinery
- ★ Chemical Plant
- Oil Production
- Pipelines and Storage



# PLEASE PAUSE FOR DEMO

PSE  
DataLink - Exchanger



\\SCALAB02\Anacortes1 - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute Search

### Elements

Elements

- Anacortes Refinery
  - Heat Exchanger-210
  - Heat Exchanger-216
  - Heat Exchanger-217
  - Heat Exchanger-218
  - Heat Exchanger-219
  - Heat Exchanger-220
  - Heat Exchanger-221
  - Heat Exchanger-222
  - Heat Exchanger-223
  - Heat Exchanger-224
  - Heat Exchanger-301
  - Heat Exchanger-302
  - Heat Exchanger-303
  - Heat Exchanger-304
  - Heat Exchanger-305
  - Heat Exchanger-306
  - Heat Exchanger-307
  - Heat Exchanger-308
  - Heat Exchanger-309
  - Heat Exchanger-310
  - Heat Exchanger-311
  - Heat Exchanger-312
  - Heat Exchanger-313
  - Heat Exchanger-314
  - Heat Exchanger-315
  - Heat Exchanger-316
  - Heat Exchanger-317
  - Heat Exchanger-318
  - Heat Exchanger-319

### Heat Exchanger-210

General Child Elements Attributes Ports Version

Filter

Name	Value	Data Reference
Area	1200 ft <sup>2</sup>	Table Lookup
Calculated Heat Transfer Coefficient	8.08294009259129 Btu/h/ft <sup>2</sup> /F	Formula
Cold Side Inlet Temperature	128.039932250977 °F	PI Point
Cold Side Outlet Temperature	172.614288330078 °F	PI Point
Cold Side Temperature Difference	44.5743560791016 delta °F	Formula
Design Heat Transfer Coefficient	305.7 Btu/h/ft <sup>2</sup> /F	Table Lookup
Fouling factor FPI	97.355924078314928	Formula
Heat Duty	57.2737068971556 MM Btu/h	Formula
Heat Duty Shell Side	1.00344755368703 MM Btu/h	Formula
Heat Duty Tube Side	1.51436029352418 MM Btu/h	Formula
Hot Side Inlet Temperature	319.550170898438 °F	PI Point
Hot Side Outlet Temperature	293.734008789063 °F	PI Point
Hot Side Temperature Difference	25.816162109375 delta °F	Formula
Information		<None>
LMTD	156.127213218721 delta °F	Formula
Shell Side Density	45 lb/ft <sup>3</sup>	<None>
Shell Side Heat Capacity	0.95 Btu/lb/F	Table Lookup
Shell Side Mass Flow	11.3651950359345 lb/s	Formula
Shell Side Material	WX1000	<None>
Shell Side Volume Flow	113.356750488281 gpm	PI Point
Tube Side Density	58 lb/ft <sup>3</sup>	<None>

Group by: ☐ Category ☐ Template

Name: Calculated Heat Transfer Coeff

Description: UC

Configuration Item: ☐

Categories: Specification

Default UOM: Btu/h/ft<sup>2</sup>/F

Value Type: Double

Value: 8.08294009259129 Btu/h/ft<sup>2</sup>/F

Data Reference: Formula

Settings...

A=Heat Duty Shell Side;UOM=MM Btu/h;B=Heat Duty Tube Side;UOM=MM Btu/h;C=Area;UOM=ft<sup>2</sup>;D=LMTD;UOM=delta °F;if C > 0 and D > 0 then max(A,B)/(C\*D) else 0;UOM=MM Btu/h/ft<sup>2</sup>/F

Calculated Heat Transfer Coefficient

\\SCALAB02\\Anacortes1 - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Template New Attribute Template Search

### Library

- Anacortes1
  - Categories
    - Analysis Categories
    - Attribute Categories
    - Element Categories
    - Reference Type Categories
    - Table Categories
  - Templates
    - Element Templates
      - Heat Exchanger
    - Event Frame Templates
    - Model Templates
    - Transfer Templates
  - Enumeration Sets
  - Reference Types
  - Tables

### Heat Exchanger

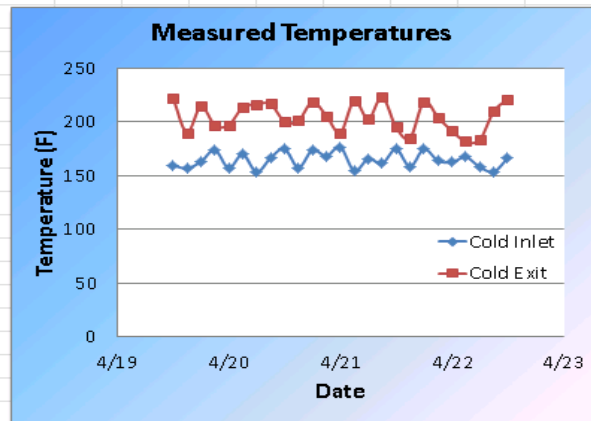
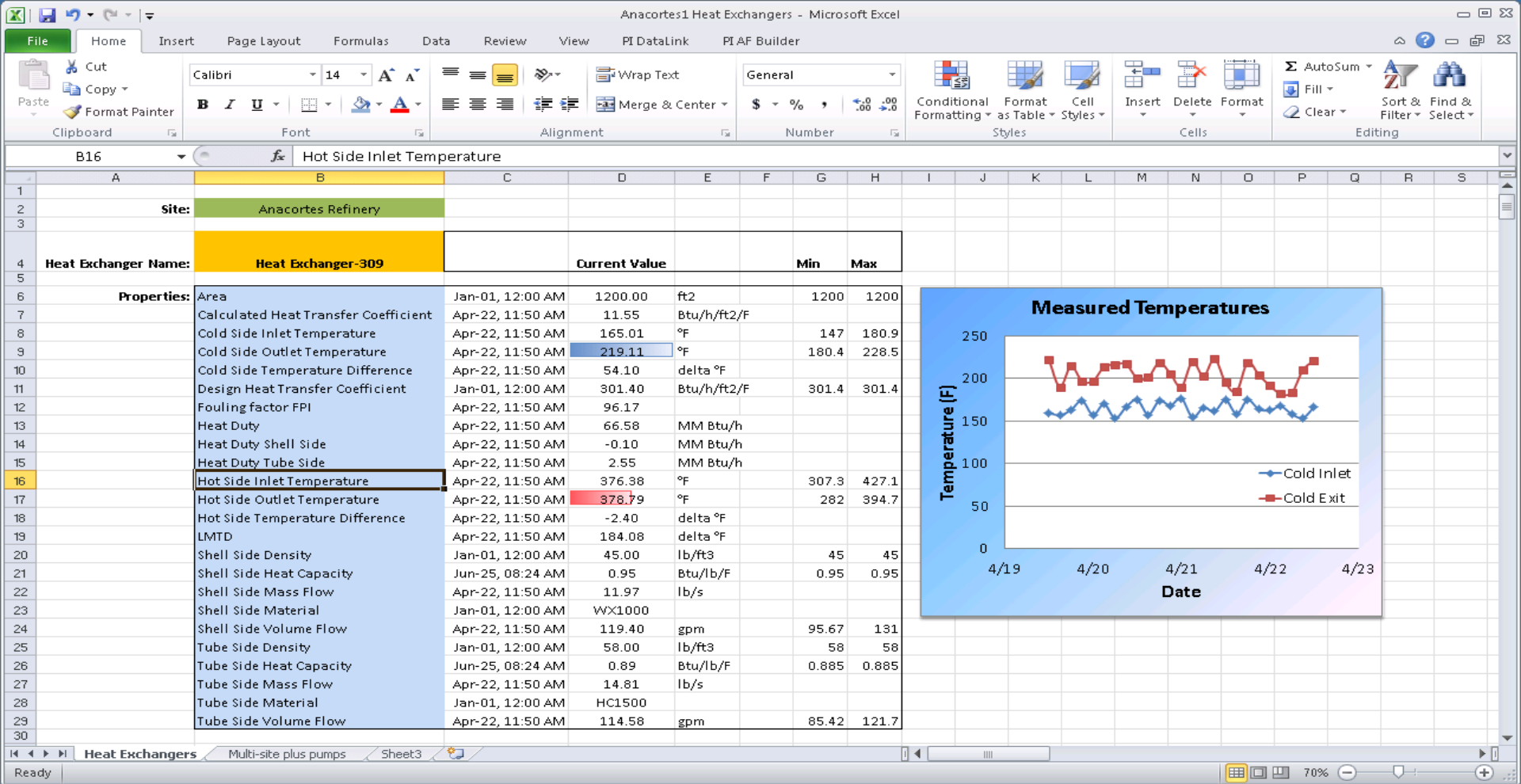
General Attribute Templates Ports

Group by: ☐ Category ☐ Template

Filter

Name	Description	Default Value	Unit Of Measure	Data Reference	Settings...
Area		0 ft2	square foot	Table Lookup	SELECT Area FROM [Heat Exchanger Specifications] WHERE [Equipment No] = '%Element%'
Calculated Heat Transfer Coeffi...	UC	6.3 Btu/h/ft2/F	Btu/h/ft2/F	Formula	A=Heat Duty Shell Side;UOM=MM Btu/h;B=Heat Duty Tube Side;UOM=MM Btu/h;C=Area;UOM...
Cold Side Inlet Temperature		0 °F	degree Fahren...	PI Point	\\%Server%\%@\;PI Tag%
Cold Side Outlet Temperature		0 °F	degree Fahren...	PI Point	\\%Server%\%@\;PI Tag%
Cold Side Temperature Difference		0 delta °F	delta degree Fa...	Formula	A=Cold Side Inlet Temperature;B=Cold Side Outlet Temperature;[B-A]
Design Heat Transfer Coefficient	UE	6.3 Btu/h/ft2/F	Btu/h/ft2/F	Table Lookup	SELECT Coefficient FROM [Heat Exchanger Specifications] WHERE [Equipment No] = '%Elemen...
Fouling factor FPI		0	<None>	Formula	A=Calculated Heat Transfer Coefficient;B=Design Heat Transfer Coefficient;if B>0 then abs(B-A)/...
Heat Duty	Design	0 MM Btu/h	million British th...	Formula	A=Area;UOM=ft2;B=Design Heat Transfer Coefficient;UOM=Btu/h/ft2/F;C=LMTD;UOM=delta °F;...
Heat Duty Shell Side	Actual	0 MM Btu/h	million British th...	Formula	A=Shell Side Mass Flow;UOM=lb/s;B=Hot Side Temperature Difference;UOM=delta °F;C=Shell Si...
Heat Duty Tube Side	Actual	0 MM Btu/h	million British th...	Formula	A=Tube Side Mass Flow;UOM=lb/s;B=Cold Side Temperature Difference;UOM=delta °F;C=Tube ...
Hot Side Inlet Temperature		0 °F	degree Fahren...	PI Point	\\%Server%\%@\;PI Tag%
Hot Side Outlet Temperature		0 °F	degree Fahren...	PI Point	\\%Server%\%@\;PI Tag%
Hot Side Temperature Difference		0 delta °F	delta degree Fa...	Formula	A=Hot Side Inlet Temperature;B=Hot Side Outlet Temperature;[A-B]
Information		—	<None>	<None>	
LMTD		0 delta °F	delta degree Fa...	Formula	A=Cold Side Inlet Temperature;B=Cold Side Outlet Temperature;C=Hot Side Inlet Temperature;D=...
Shell Side Density		45 lb/ft3	pound per cubi...	<None>	
Shell Side Heat Capacity		0 Btu/lb/F	Btu/lb/F	Table Lookup	SELECT [Heat Capacity] FROM [Material Properties Table] WHERE [Material ID] = @[Shell Side ...
Shell Side Mass Flow		800 lb/s	pound per seco...	Formula	A=Shell Side Volume Flow;UOM=ft3/s;B=Shell Side Density;UOM=lb/ft3;[A*B]
Shell Side Material		WX1000	<None>	<None>	
Shell Side Volume Flow		8000 gpm	Gallons per min...	PI Point	\\%Server%\%@\;PI Tag%
Tube Side Density		58 lb/ft3	pound per cubi...	<None>	

Heat Exchanger Modified:4/21/2012 2:54:11 PM.





Anacortes  
over time..

- ★ Headquarters
- ★ Refinery
- ★ Chemical Plant
- Oil Production
- Pipelines and Storage



# PLEASE PAUSE FOR DEMO

PSE  
DataLink - Energy



\\SCALAB02\\Anacortes2 - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Template New Attribute Template Search

### Library

- Anacortes2
  - Categories
    - Analysis Categories
    - Attribute Categories
    - Element Categories
    - Reference Type Categories
    - Table Categories
  - Templates
    - Element Templates
      - Base Metrics**
      - Boiler
      - Compressor
      - Cooling Fan
      - Heat Exchanger
      - Heater
      - Pump
      - Refinery
      - Unit
    - Event Frame Templates
    - Model Templates
    - Transfer Templates
  - Enumeration Sets
  - Reference Types
  - Tables

### Base Metrics

General Attribute Templates Ports

Group by: ☐ Category ☐ Template

Filter

	Name	Description	Default Value	Unit Of Measure	Data Reference	Settings...
+	Asset Down		0 %	percent	Formula	A=,Down;UOM=h:[A/8*100]
+	Asset Maintenance		0 %	percent	Formula	A=,Maintenance;UOM=h:[A/8*100]
+	Asset Problems		0 %	percent	Formula	A=,Problems;UOM=h:[A/8*100]
+	Asset Running		0 %	percent	Formula	A=,Running;UOM=h:[A/8*100]
+	Availability		0 h	hour	Formula	A=Availability Sec:[B=A*24];roundfrac(B,2)]
+	Availability Sec		0 h	hour	PI Point	\\%Server%\%@\PI Tag%;TimeMethod=TimeRangeOverride;Relative Time=-*3m;TimeRangeMethod=...
+	Efficiency		0 %	percent	PI Point	\\%Server%\%@\PI Tag%;TimeMethod=Interpolated;Relative Time=-*1h;TimeRangeMethod=Averag...
+	Feed Rate		0 kbbl/d	thousand barrel...	PI Point	\\%Server%\%@\PI Tag%;TimeMethod=TimeRange;Relative Time=-*1h;TimeRangeMethod=Averag...
+	Operating State		Running	<None>	PI Point	\\%Server%\%@\PI Tag%;TimeMethod=Interpolated
+	Operating State Integer		0	<None>	PI Point	!Operating State;TimeMethod=Interpolated
+	Power Draw		0 kW	kilowatt	PI Point	\\%Server%\%@\PI Tag%;TimeMethod=TimeRange;Relative Time=-*1h;TimeRangeMethod=Averag...
+	Power Draw Maximum		0 kW	kilowatt	PI Point	!Power Draw;TimeMethod=TimeRangeOverride;Relative Time=-*1h;TimeRangeMethod=Maximum;Tim...
+	Power Draw Minimum		0 kW	kilowatt	PI Point	!Power Draw;TimeMethod=TimeRangeOverride;Relative Time=-*1h;TimeRangeMethod=Minimum;Tim...
+	Power Draw Std		0 kW	kilowatt	PI Point	!Power Draw;TimeMethod=TimeRangeOverride;Relative Time=-*1h;TimeRangeMethod=Standard Dev...
+	Power Usage KPI		0	<None>	Formula	F=Feed Rate;P=Power Draw:[if F>0 then P/F else 0]

Elements

Event Frames

Library

Unit of Measure

Base Metrics Modified:4/18/2012 11:22:07 AM.

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute Search

### Elements

Elements

- Anacortes Refinery
  - Alkylation
    - Cooling Fan-378
    - Heat Exchanger-210
    - Heat Exchanger-216
    - Heat Exchanger-217
    - Heat Exchanger-218
    - Heat Exchanger-219
    - Heat Exchanger-220
    - Heat Exchanger-221
    - Pump-110
    - Pump-210
    - Pump-3019
    - Pump-3343
    - Pump-3667
    - Pump-3991
    - Pump-432
    - Pump-619
  - Atmospheric Distillation
  - Catalytic Cracking
  - Coking
  - Hydrosulfurization
  - Isomerization
  - Naphtha Reforming
  - Vacuum Distillation
  - Viscosity Reduction

Elements
Event Frames
Library
Unit of Measure

### Anacortes Refinery

General Child Elements Attributes Ports Version

Filter

Name	Value	
Asset Down	1.99463166130914 %	R.
Asset Maintenance	2.62925387606209 %	R.
Asset Problems	3.06383658044132 %	R.
Asset Running	92.3034652898341 %	R.
Availability	NaN h	R.
Power Draw	2017.74177028526 kW	R.
Power Draw Maximum	2132.09774017334 kW	R.
Power Draw Minimum	1916.51013183594 kW	R.
Power Draw Std	5.37792259026868 kW	R.
Power Usage KPI	6.7337722260915225	R.

Group by: Category Template

Name: Power Usage KPI

Description:

Configuration Item:

Categories: Power KPI

Default UOM: <None>

Value Type: Double

Value: 6.7337722260915225

Data Reference: Rollup

Settings...

CategoryName=Power KPI;Calculation=Avg

Anacortes Refinery Modified:4/18/2012 11:22:08 AM. Version: 1/1/1970 12:00:00 AM, Revision 1

## Elements

- Elements
  - Anacortes Refinery
    - Alkylation
    - Atmospheric Distillation
    - Catalytic Cracking
    - Coking
    - Hydrosulfurization
    - Isomerization
    - Naphtha Reforming
    - Vacuum Distillation
    - Viscosity Reduction

## Elements

## Event Frames

## Library

## Unit of Measure

Availability Sec

## Alkylation

General Child Elements Attributes Ports Version

Filter

	Name	Value	Data Reference
	Asset Down	6.2814559365234 %	Formula
	Asset Maintenance	0.438705126444499 %	Formula
	Asset Problems	1.19850773281521 %	Formula
	Asset Running	92.0523478190104 %	Formula
	Availability	Data was not available for attribute 'Availability Sec'. Calculation failed.	Formula
	Availability Sec	Calculation failed.	PI Point
	Efficiency	93.2062454223633 %	PI Point
	Feed Rate	28.0046903700332 kbbbl/d	PI Point
	Operating State	Running	PI Point
	Operating State Integer	1	PI Point
	Power Draw	79.624831980181 kW	PI Point
	Power Draw Maximum	81.5486373901367 kW	PI Point
	Power Draw Minimum	78.1760177612305 kW	PI Point
	Power Draw Std	0.703516768431038 kW	PI Point
	Power Usage KPI	2.8432677143749019	Formula
	SVG File		<None>

Group by: Category Template

Name: Availability Sec

Description:

Configuration Item:

Categories: Performance Metrics

Default UOM: hour

Value Type: Double

Value: Calculation failed.

Data Reference: PI Point

Settings...

\\10.8.64.40\Anacortes  
Refinery Alkylation Availability  
Sec;TimeMethod=TimeRangeOverride;Relative Tim  
e=+  
3m;TimeRangeMethod=Average;TimeRangeMinPe  
rcentGood=20;UOM=s

Anacortes2 Power - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View **PI DataLink** PIAF Builder

Current Value Single Value Archive Value Compressed Data Sampled Data Timed Data Calculated Data Time Filtered Calculation Search Properties Update Settings About Help Resources

B1 Anacortes Refinery

		Efficiency	Operating State	Power Draw	Power Draw Minimum	Power Draw Maximum	Power Draw Std
1	<b>Anacortes Refinery</b>						
2							
3							
4	Alkylation	85.21	Running	77.26	69.62	80.33	2.32
5	Atmospheric Distillation	81.11	Running	100.07	94.82	110.18	3.14
6	Catalytic Cracking	108.79	Running	306.61	297.54	321.08	5.09
7	Coking	93.46	Running	178.84	169.89	187.41	4.62
8	Hydrosulfurization	109.23	Running	357.30	347.92	364.64	3.76
9	Isomerization	62.19	Running	325.40	311.48	344.75	10.09
10	Naphtha Reforming	93.48	Running	203.39	185.05	224.59	9.76
11	Vacuum Distillation	81.62	Running	345.26	305.44	381.32	15.30
12	Viscosity Reduction	53.12	Running	71.38	67.01	75.14	1.85
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

Power by Area Sheet2 Sheet3

Ready



Baton Rouge

- ★ Headquarters
- ★ Refinery
- ★ Chemical Plant
- Oil Production
- Pipelines and Storage





# PLEASE PAUSE FOR DEMO

PSE  
ProcessBook ERD

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute Search

### Elements

- Elements
  - Anacortes Refinery
  - Baton Rouge Refinery
    - Alkylation
      - Cooling Fan-101
      - Heat Exchanger-100
      - Heat Exchanger-101
      - Heat Exchanger-102
      - Heat Exchanger-103
      - Heat Exchanger-104
      - Heat Exchanger-200
      - Pump-101**
      - Pump-201
      - Pump-3010
      - Pump-3334
      - Pump-3658
      - Pump-3982
      - Pump-403
      - Pump-610
      - Unit1
      - Unit2
    - Atmospheric Distillation
    - Catalytic Cracking
    - Coking
    - Hydrosulfurization
    - Isomerization
    - Naphtha Reforming
    - Vacuum Distillation
    - Viscosity Reduction

Elements Event Frames Library Unit of Measure

### Pump-101

General Child Elements Attributes Ports Version

Filter

Name	Value	Data Reference
a0	34.892	Table Lookup
a1	0.055	Table Lookup
a2	-0.0021	Table Lookup
CL	95	<None>
Cost per Hour	1.09740144415615 US\$	Formula
Discharge Pressure	530.578552246094 psi	Formula
Electricity Cost Factor	0.160777315497398 US\$	PI Point
Flow Rate	135.25 gpm	Formula
Impeller Size	3	<None>
LCL	92.5	<None>
Liquid Gravity	1 SG	<None>
Minimum Efficiency	90 %	<None>
Model Number	G11	<None>
Pump Curve Head	3.91636875 psi	Formula
Pump Downtime During Last Shift %	0.366758267084758 %	Formula
Pump Efficiency	468.359440370542 %	Formula
Pump Head Efficiency	100 %	Formula
Pump Horse Power	9.15327870237534 hp	Formula
Pump Name	Pump-101	String Concat
Pump Operation	1	Formula
Pump Uptime During Last Shift	7.97065933863322 h	Formula

Group by: ☐ Category ☐ Template

Name: UCL

Description:

Configuration Item: ☐

Categories: SQC Control Limits

Default UOM: <None>

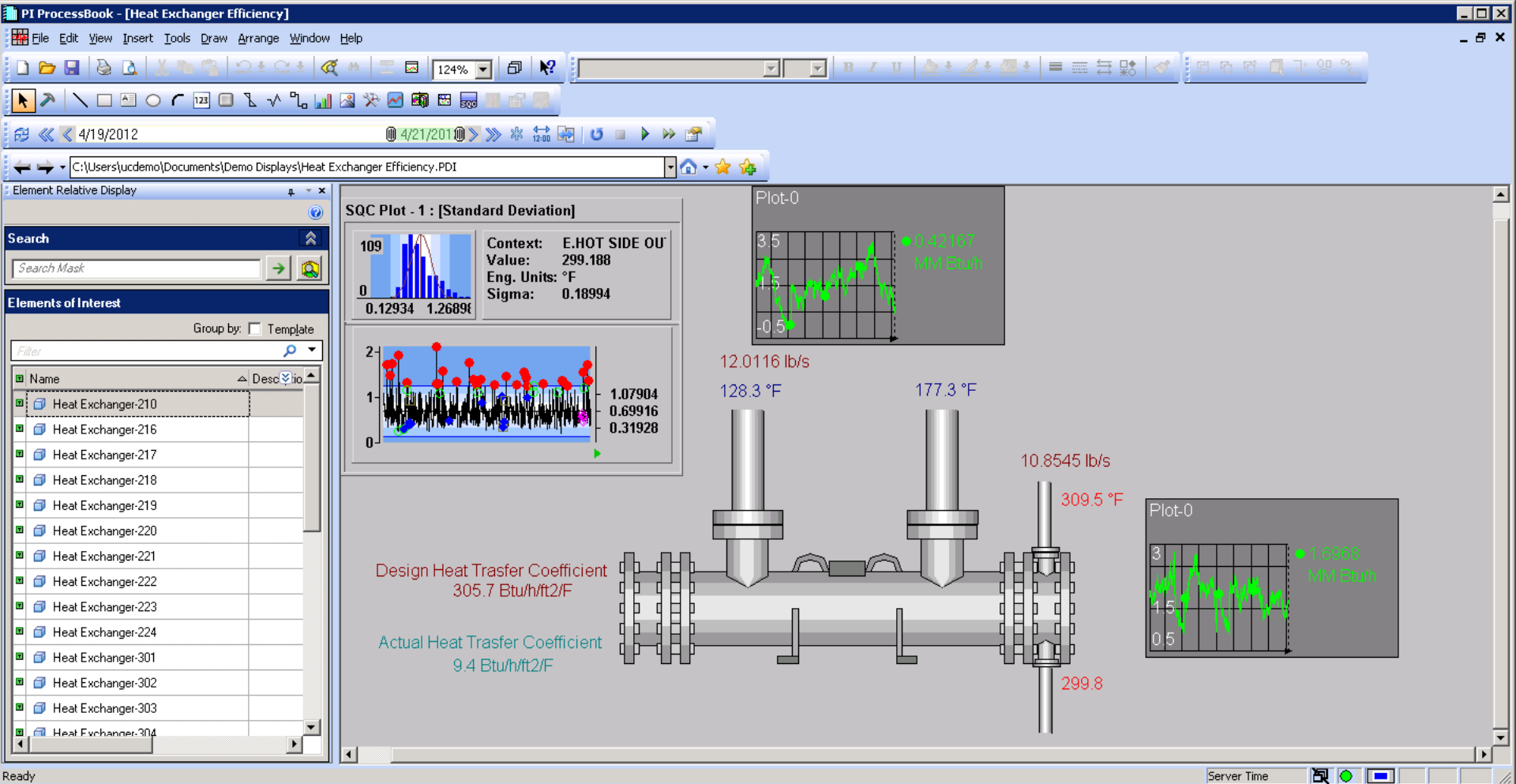
Value Type: Double

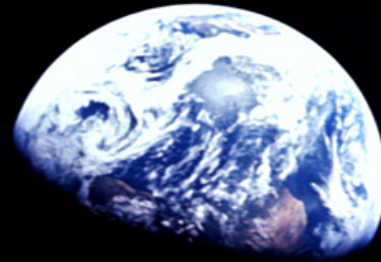
Value: 99.9

Data Reference: <None>

Settings...

Pump-101 Modified:4/18/2012 11:22:45 AM. Version: 1/1/1970 12:00:00 AM, Revision 1





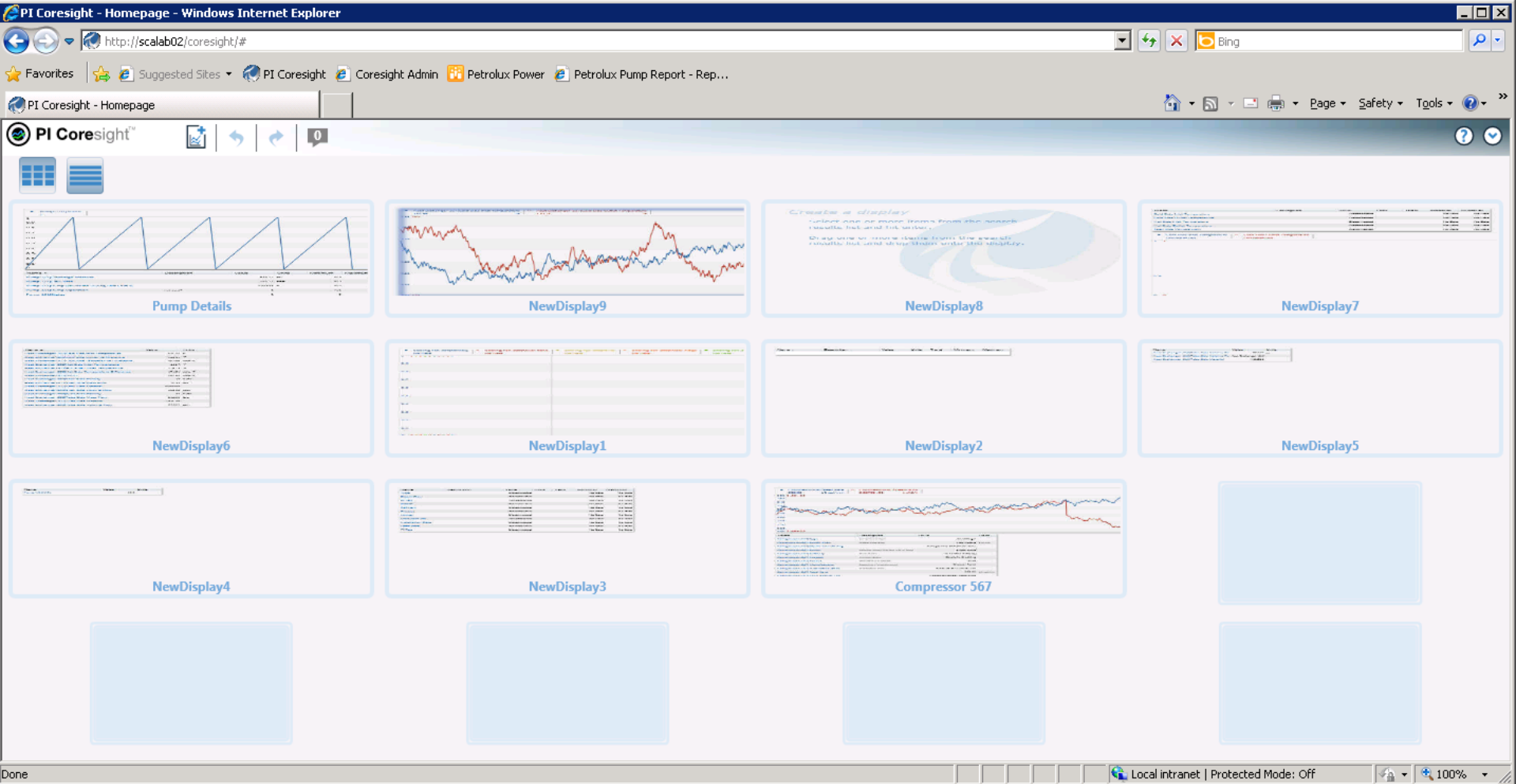
# Exploration



# PLEASE PAUSE FOR DEMO

Coresight 1.0 Features  
Coresight 1.1 Compare





PI Coresight - NewDisplay

http://scalab02/coresight/#/1/NewDisplay

PI Coresight homepage

Home > "pump"

pump

- Pump Details
  - Pump-101.Discharge Pressure
  - Pump-101.Discharge Pressure.SIM
  - Pump-101.DownTime
  - Pump-101.DownTime.Name
  - Pump-101.Electricity Cost Factor
  - Pump-101.Flow Rate
  - Pump-101.Pump Downtime During Last Shift %
  - Pump-101.RunTime.Name
- Search
- Related Assets
- Cart
  - Drag symbols to the Cart area to store for later use. Click for more details.

Create a display

Select one or more items from the search results list and hit enter.

Drag one or more items from the search results list and drop them onto the display.

4/21/2012 8:31:15 AM 1h 8h 1d 1w 1mo 8h Now 4/21/2012 4:31:15 PM

9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM

Apr 15 16 17 18 19 Apr 20 21

Done Local intranet | Protected Mode: Off 100%



PI Coresight - NewDisplay10 - Windows Internet Explorer

http://scalab02/coresight/#/Displays/12/NewDisplay10

PI Coresight - NewDisplay10

PI Coresight homepage

NewDisplay10

Home > "pump"

pump

Pump Details




- Pump-101.Discharge Pressure
- Pump-101.Discharge Pressure.SIM
- Pump-101.DownTime
- Pump-101.DownTime.Name
- Pump-101.Electricity Cost Factor
- Pump-101.Flow Rate
- Pump-101.Pump Downtime During Last Shift %
- Pump-101.RunTime.Name

Search

Related Assets

Cart

Drag symbols to the Cart area to store for later use. Click for more details.

Name	Description	Value	Units	Trend	Minimum	Maximum
Pump-101.Discharge Pressure		561.88			0	561.23
Pump-101.Flow Rate		117.83			0	208.78
Pump-101.Electricity Cost Factor		0.15722			0.14417	0.17603

4/21/2012 8:36:22 AM

1h 8h 1d 1w 1mo

8h

Now

4/21/2012 4:36:22 PM

9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM

Apr 15 16 17 18 19 Apr 20 21

Done

Local intranet | Protected Mode: Off

100%

PI Coresight - NewDisplay10 - Windows Internet Explorer

http://scalab02/coresight/#/Displays/12/NewDisplay10

PI Coresight - NewDisplay10

PI Coresight homepage

NewDisplay10

Home ▶ SCALAB02 ▶ Baton Rouge ▶ Baton Rouge Refinery ▶ "pump"

pump

- Alkylation
  - Pump-101
  - Pump-201
  - Pump-3010
  - Pump-3334
  - Pump-3658
  - Pump-3982
  - Pump-403
  - Pump-610

Search

Related Assets

Cart

Drag symbols to the Cart area to store for later use. Click for more details.

Create a display

Select one or more items from the search results list and hit enter.

Drag one or more items from the search results list and drop them onto the display.

4/21/2012 8:42:21 AM 1h 8h 1d 1w 1mo 8h Now 4/21/2012 4:42:21 PM

9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM

Apr 15 16 17 18 19 Apr 20 21

Done

Local intranet | Protected Mode: Off



PI Coresight - NewDisplay10 - Windows Internet Explorer

http://scalab02/coresight/#/Displays/12/NewDisplay10

PI Coresight - NewDisplay10

PI Coresight homepage NewDisplay10

Home ▶ SCALAB02 ▶ Baton Rouge2 ▶ Baton Rouge Refinery ▶ Alkylation ▶

Search in Alkylation

- Availability Sec
- Cooling Fan-101
- Efficiency
- Feed Rate
- Heat Exchanger-100
- Heat Exchanger-101
- Heat Exchanger-102
- Heat Exchanger-103
- Heat Exchanger-104

Related Assets (58)

Cart

Drag symbols to the Cart area to store for later use. Click for more details.

Name	Description	Value	Units	Trend	Minimum	Maximum
Heat Exchanger-100 Tube Side Volume Flow		114.59	gpm		98.086	125.84
Heat Exchanger-100 Tube Side Volume Flow PI Tag	Heat Exchanger-100			_____	n/a	n/a
Heat Exchanger-100 Tube Side Material		HC1500		_____	n/a	n/a
Heat Exchanger-100 Tube Side Density		58	lb/ft3	_____	n/a	n/a
Heat Exchanger-100 Shell Side Volume Flow		124.92	gpm		110.05	138.06
Heat Exchanger-100 Shell Side Volume Flow PI Tag	Heat Exchanger-100			_____	n/a	n/a
Heat Exchanger-100 Shell Side Material		WX1000		_____	n/a	n/a
Heat Exchanger-100 Shell Side Density		45	lb/ft3	_____	n/a	n/a
Heat Exchanger-100 Hot Side Outlet Temperature		268.54	°F		234.37	286.76
Heat Exchanger-100 Hot Side Outlet Temperature PI Tag	Heat Exchanger-100			_____	n/a	n/a
Heat Exchanger-100 Hot Side Inlet Temperature		315.88	°F		262.6	369.71
Heat Exchanger-100 Hot Side Inlet Temperature PI Tag	Heat Exchanger-100			_____	n/a	n/a
Heat Exchanger-100 Cold Side Outlet Temperature		199.76	°F		159.28	212.79
Heat Exchanger-100 Cold Side Outlet Temperature PI Tag	Heat Exchanger-100			_____	n/a	n/a
Heat Exchanger-100 Cold Side Inlet Temperature		135.29	°F		125.35	170.42
Heat Exchanger-100 Cold Side Inlet Temperature PI Tag	Heat Exchanger-100			_____	n/a	n/a

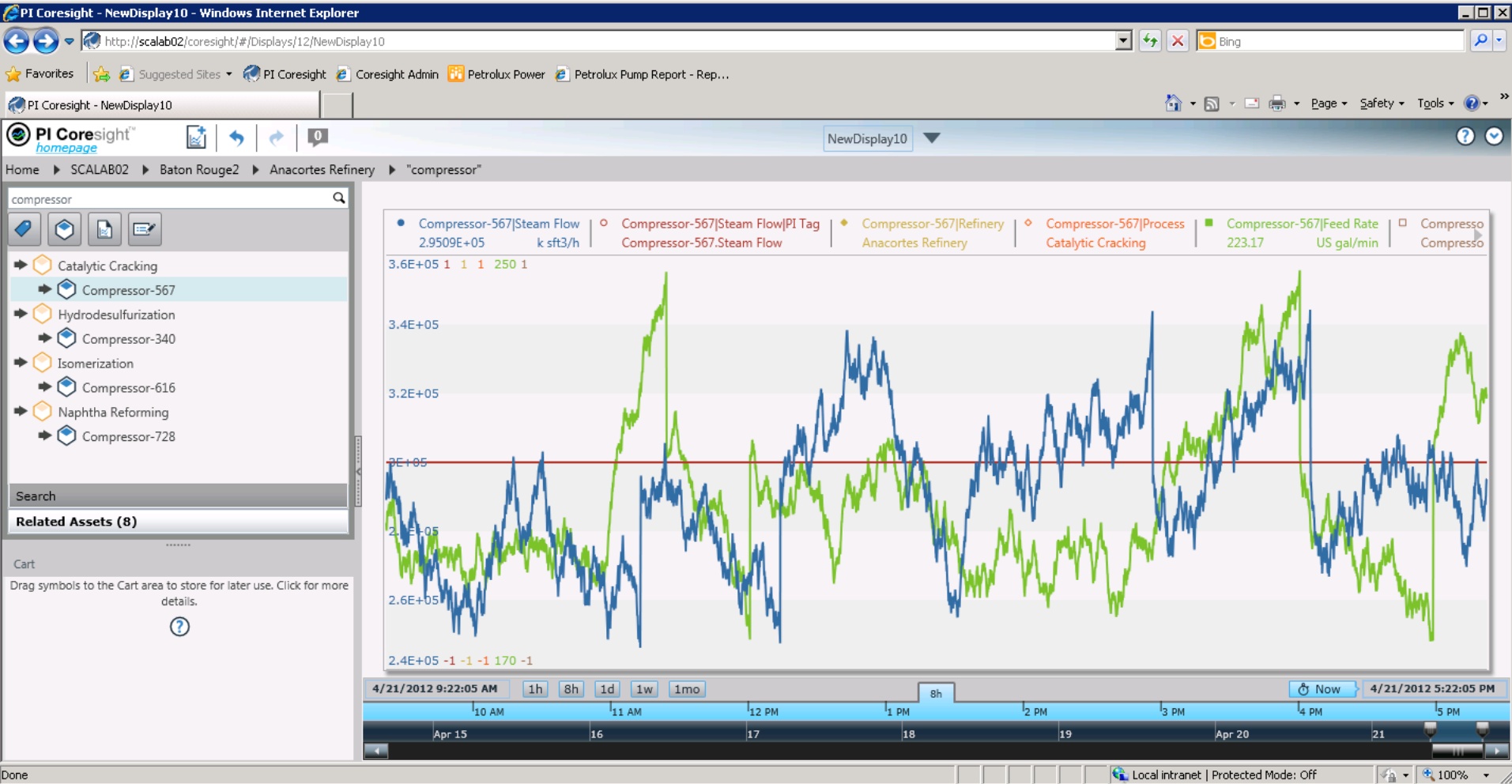
4/21/2012 9:18:34 AM 1h 8h 1d 1w 1mo 8h Now 4/21/2012 5:18:34 PM

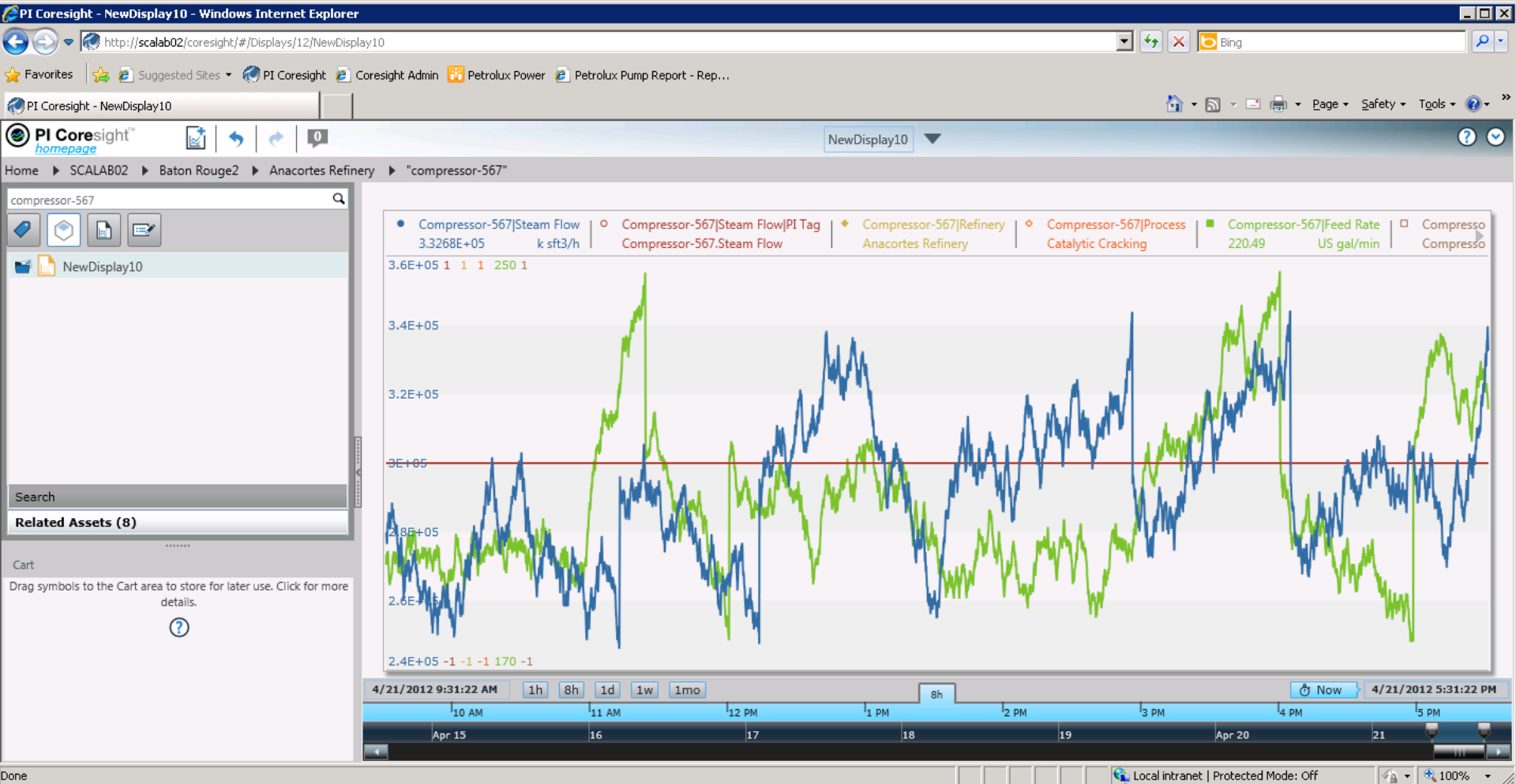
10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM 5 PM

Apr 15 16 17 18 19 Apr 20 21

Done Local intranet | Protected Mode: Off 100%









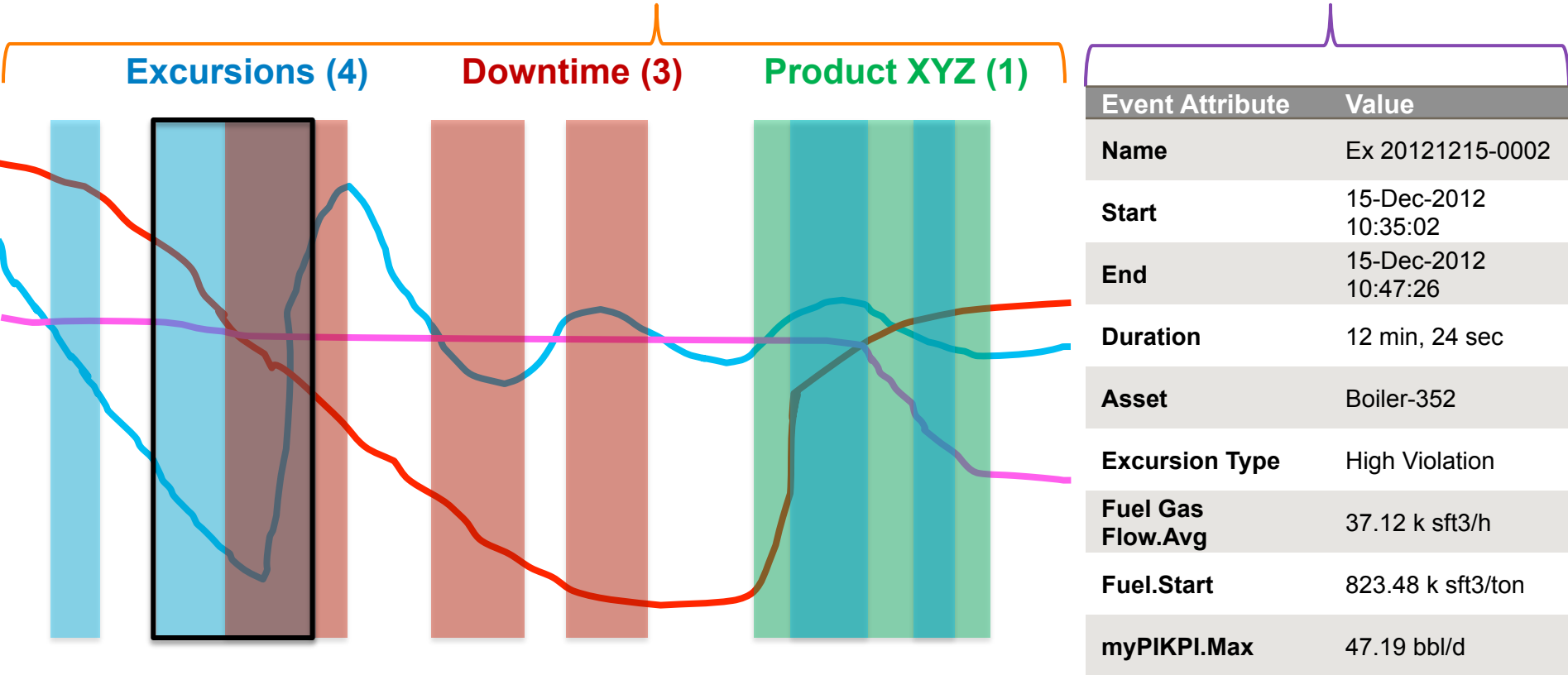








**PI Event Frames** is a core capability of the PI Server to record important process or business events and help you find the related data.



# PI Notifications

- Define key events
- Customize message content
- Send to people and systems
- Acknowledge and escalate
- Simplify deployment with templates



Fuel Gas Flow is 38.72 scf/h





# PLEASE PAUSE FOR DEMO

EF (PSE, SQL Report, Web Parts)  
Notifications (Config, email, Coresight)

### Event Frame Search 1

Group by: ☒ Category ☐ Template



Name	[2.17:44:54.94...	Start Time	End Time	Description	Category	Template
Pump-101 ...		4/16/2012 8:4...	4/16/2012 9:4...			Pump RunTime
Pump-101 ...		4/16/2012 9:4...	4/16/2012 10:...			Pump DownTime
Pump-101 ...	H	4/16/2012 10:...	4/17/2012 2:1...			Pump RunTime
Pump-101 ...	I	4/17/2012 2:1...	4/17/2012 2:4...			Pump DownTime
Pump-101 ...	H	4/17/2012 2:4...	4/17/2012 6:4...			Pump RunTime
Pump-101 ...	I	4/17/2012 6:4...	4/17/2012 7:0...			Pump DownTime
Pump-101 ...	H	4/17/2012 7:0...	4/17/2012 11:...			Pump RunTime
Pump-101 ...	I	4/17/2012 11:...	4/17/2012 11:...			Pump DownTime
Pump-101 ...	H	4/17/2012 11:...	4/17/2012 3:4...			Pump RunTime
Pump-101 ...	I	4/17/2012 3:4...	4/17/2012 4:0...			Pump DownTime
Pump-101 ...	H	4/17/2012 4:0...	4/17/2012 8:0...			Pump RunTime
Pump-101 ...	I	4/17/2012 8:0...	4/17/2012 8:3...			Pump DownTime
Pump-101 ...	H	4/17/2012 8:3...	4/18/2012 12:...			Pump RunTime
Pump-101 ...	I	4/18/2012 12:...	4/18/2012 1:0...			Pump DownTime
Pump-101 ...	H	4/18/2012 1:0...	4/18/2012 5:0...			Pump RunTime
Pump-101 ...	I	4/18/2012 5:0...	4/18/2012 5:2...			Pump DownTime
Pump-101 ...	H	4/18/2012 5:2...	4/18/2012 9:3...			Pump RunTime
Pump-101 ...	I	4/18/2012 9:3...	4/18/2012 9:5...			Pump DownTime
Pump-101 ...	H	4/18/2012 9:5...	4/18/2012 2:0...			Pump RunTime
Pump-101 ...	I	4/18/2012 2:0...	4/18/2012 2:2...			Pump DownTime
Pump-101 ...	H	4/18/2012 2:2...	4/18/2012 6:2...			Pump RunTime
Pump-101 ...	I	4/18/2012 6:2...	4/18/2012 6:5...			Pump DownTime

### Unit of Measure

## Event Frame Search

Petrolux Pump Report - Report Manager - Windows Internet Explorer

http://scalab02/Reports/Pages/Report.aspx?ItemPath=%2fPetrolux+Production+Reports%2fPetrolux+Pump+Report

Home > Petrolux Production Reports > Petrolux Pump Report

Refinery: Baton Rouge Refinery Refinery Unit: Alkylation View Report

1 of 1 100% Find | Next

## Petrolux Pump Report

Report Name: Petrolux Pump Report Report Execution Time: 4/21/2012 3:47:55 PM

Report Author: SCALE\ucdema

### Total Event Duration by Unit

Event Type	Total Event Duration	In Minutes	Event Count	Expected Duration
Pump DownTime	07:47:20	467	22	
Pump RunTime	3.06:11:34	4692	20	1051200

Duration (Minutes)

Duration Minutes

Pump RunTime Pump DownTime

### Total Event Duration by Pump



Home - Refinery Pump Events

http://ucdemo-webparts/SitePages/Refinery%20Pump%20Events.aspx

Home - Refinery Pump Events

UC DEMO

Home ▸ Refinery Pump Events

Search this site...

**Petrolux Refinery Pump Event Summary**

PumpName	EventType	EventCount	DurationTime
Pump-101	Pump RunTime	15	2:09:51:33
Pump-101	Pump DownTime	15	06:05:22
Pump-201	Pump RunTime	1	04:04:00
Pump-201	Pump DownTime	1	00:06:59
Pump-3010	Pump RunTime	1	04:04:01
Pump-3010	Pump DownTime	1	00:14:00
Pump-3658	Pump RunTime	1	04:04:00
Pump-3658	Pump DownTime	1	00:07:00
Pump-3982	Pump RunTime	1	04:04:00
Pump-3982	Pump DownTime	1	00:28:00
Pump-403	Pump DownTime	1	00:24:00
Pump-610	Pump RunTime	1	04:04:00
Pump-610	Pump DownTime	2	00:21:59

**Petrolux Pump Event Detail**

EventName	PumpName	EventType	StartTime	EndTime	Duration
Pump-101 Downtime - 2012.4.19.8.	Pump-101	Pump DownTime	4/19/2012 12:21:48 PM	4/19/2012 12:45:48 PM	00:24:00
Pump-101 Runtime - 2012.4.19.7.	Pump-101	Pump RunTime	4/19/2012 8:17:48 AM	4/19/2012 12:21:48 PM	04:04:00
Pump-101 Downtime - 2012.4.19.3.	Pump-101	Pump DownTime	4/19/2012 7:53:48 AM	4/19/2012 8:17:49 AM	00:24:01
Pump-101 Runtime - 2012.4.19.3.	Pump-101	Pump RunTime	4/19/2012 3:49:48 AM	4/19/2012 7:53:48 AM	04:04:00
Pump-101 Downtime - 2012.4.18.23.	Pump-101	Pump DownTime	4/19/2012 3:25:49 AM	4/19/2012 3:49:49 AM	00:24:00
Pump-101 Runtime - 2012.4.18.22.	Pump-101	Pump RunTime	4/18/2012 11:21:48 PM	4/19/2012 3:25:48 AM	04:04:00
Pump-101 Downtime - 2012.4.18.18.	Pump-101	Pump DownTime	4/18/2012 10:57:48 PM	4/18/2012 11:21:49 PM	00:24:01

Local intranet | Protected Mode: Off



\\SCALAB02\Petrolux - PI System Explorer (Administrator)

FileViewGoToolsHelp

DatabaseQuery DateBackCheck InRefresh

Notifications

New

Pump DownTime Notification

Elements

Event Frames

Library

Unit of Measure

MyPI

Notifications

Contacts

Pump DownTime Notification

OverviewTriggerMessageSubscriptionsHistory

Target: \\SCALAB02\Petrolux\Baton Rouge Refinery\Alkylation\Pump-101

Conditions

New Condition

Rule	Configuration	Time True	Result ...	Priority
Comparison	Status = 0	0	Outside...	AboveN...

Time Rule: Natural

Options

☒ Notify only on change in status

Resend Interval: 0 Seconds

Non Repetition Interval: 0 Seconds

\\SCALAB02\Petrolux - PI System Explorer (Administrator)

FileViewGoToolsHelp

DatabaseQuery DateBackCheck InRefresh

Notifications

NewX▶□✎

Pump DownTime Notification

Elements

Event Frames

Library

Unit of Measure

MyPI

Notifications

Contacts

Pump DownTime Notification

OverviewTriggerMessageSubscriptionsHistory

Delivery Formats

NameDelivery Channel

Down Time FormatEmail<default>

Global Default EmailEmail

DesignHTML PreviewPlain Text Preview

Arial11

!↓

Subject

Pump Name:Value is currently down on the Alkylation unit at the Baton Rouge Refinery

Attachments

Body

Pump Name:Value is down!

Details

Start time	Notification:Trigger Time
Location	Baton Rouge Refinery
Unit	Alkylation
Status	Status:Value
Pump Downtime During Last Shift %:Name	Pump Downtime During Last Shift %:Value

Content

Add✎✕

Standard Content

Notification

Target

Database

System

Acknowledge

Acknowledge With Comment

Trigger Input

Triggering Condition

Status

Target Attribute (Pump-101)

a0

a1

a2

CL

Cost per Hour

Discharge Pressure

Electricity Cost Factor

Flow Rate

Impeller Size

LCL

Liquid Gravity

Minimum Efficiency

Model Number

Pump Curve Head

Pump Downtime During Last Shift %

Pump Efficiency

Pump Head Efficiency

**Pump-101 is currently down on the Alkylation unit at the Baton Rouge Refinery**

ucdemo@osisoft.com (ucdemo@osisoft.com) [Add contact](#)

To: ucdemo@ucdemo.com;

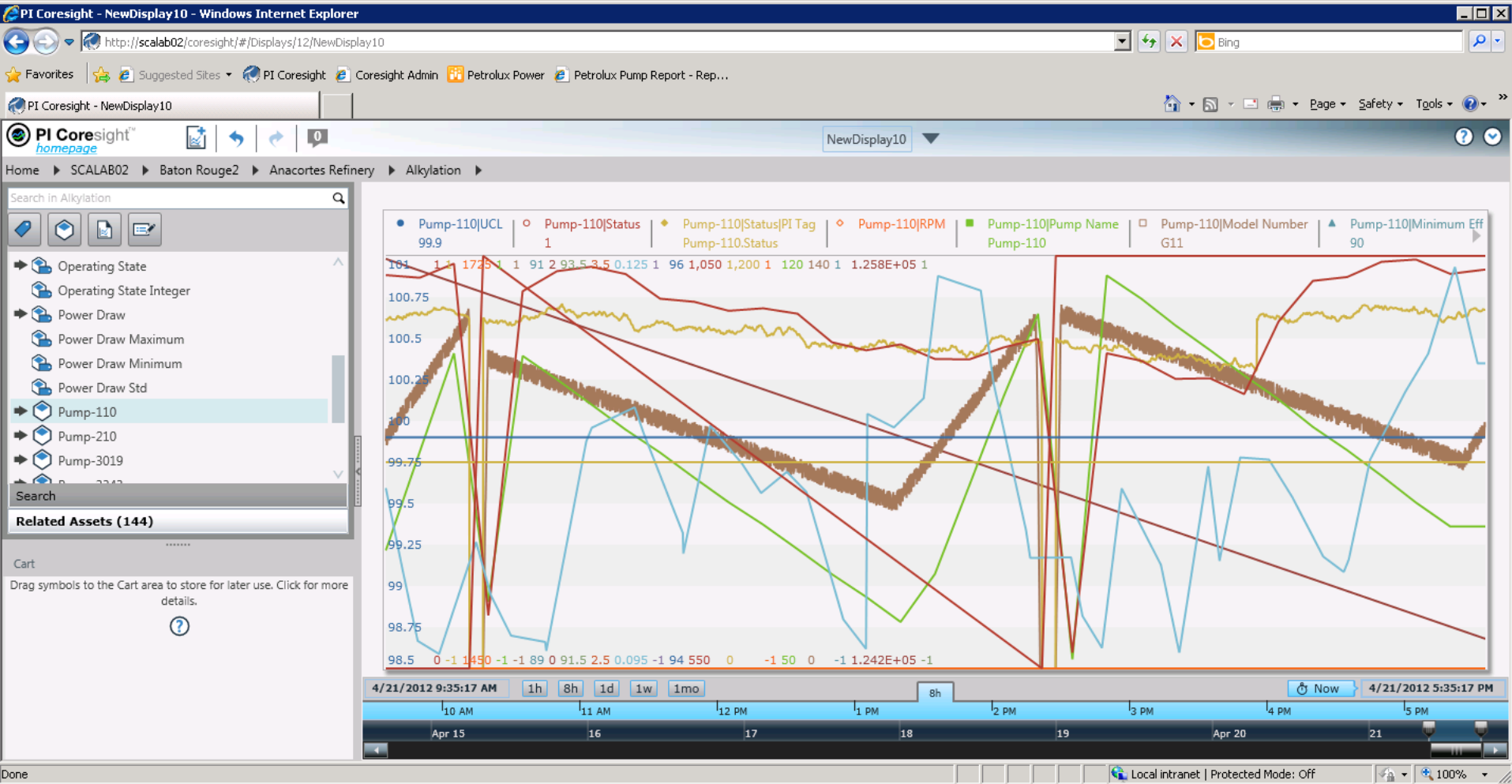
⬇ This message is Low Priority.

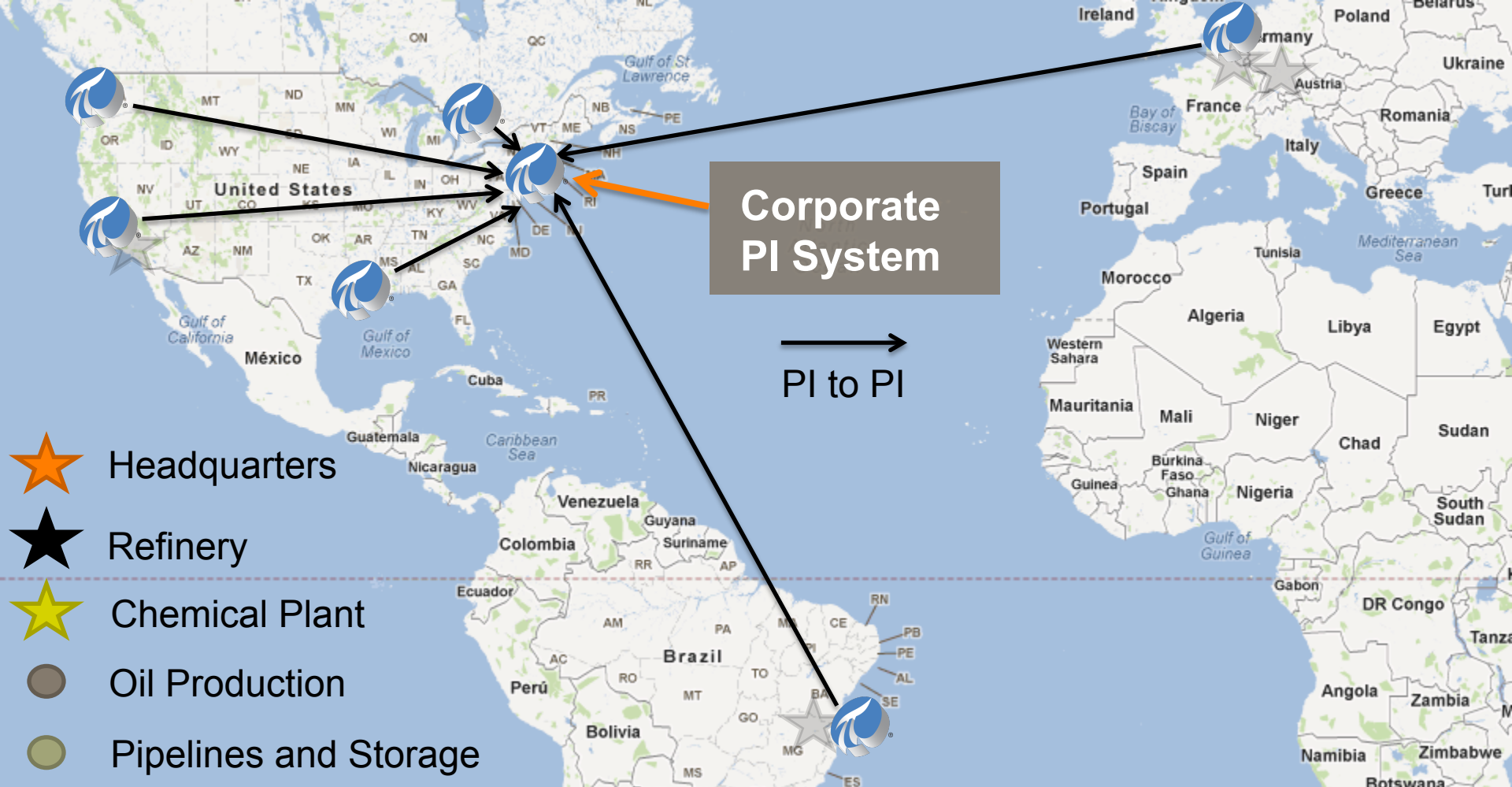
Pump-101 is currently down on the Alkylation unit at the Baton Rouge Refinery 10 PM

**Pump-101 is down!**

Details	
Start time	12:10:07 PM on 4/20/12
Location	Baton Rouge Refinery
Unit	Alkylation
Status	1
Pump Downtime During Last Shift %	0.345555649863349

For more details, please see the [PI Coresight Pump-101 Details](#) page. Please [Acknowledge](#) this notification response team.







# PLEASE PAUSE FOR DEMO

PSE  
Web Parts

\\SCALAB02\Petrolux - PI System Explorer

File Edit View Go Tools Help

Database

Query Date

Back

Check In

Refresh

New Element

Search

Elements

Elements

Anacortes Refinery

Baton Rouge Refinery

E&P

Gas

Martinez Refinery

Petrochemicals

Petrolux Corporation

PI System Server

Refining

Rotterdam Refinery

Sao Paulo Refinery

Samia Refinery

Elements

Group by: Category Template

Search

	Name	Description	Category	Type	Template	Asset Down	Asset Mainte...	Asset Problems	Asset Running	Power Draw	Power Draw ...	Power D...
+	Anacortes ...		Refining	None	Refinery	1.9506482018...	2.6272899162...	3.0632871933...	92.372549551...	2015.0957121...	2134.5046615...	1889.7250442...
+	Baton Rou...		Refining	None	Refinery	0.8646398414...	2.7677004543...	3.4087174498...	92.973637333...	2867.8177151...	3032.9649505...	2680.0256805...
+	E&P		Division	None	Division							
+	Gas		Division	None	Division							
+	Martinez R...		Refining	None	Refinery	2.7554177649...	2.2693624134...	2.1103173450...	92.842362768...	3175.9211405...	3403.2667999...	2949.2541809...
+	Petrochem...		Division	None	Division							
+	Petrolux C...		Company	None	Company							
+	PI System ...		PI System	None	PI System Server							
+	Refining		Division	None	Division							
+	Rotterdam ...		Refining	None	Refinery	1.6428950274...	2.9672329455...	2.6441386069...	92.755421579...	3044.9018732...	3245.0040283...	2883.8815460...
+	Sao Paulo ...		Refining	None	Refinery	2.1608639469...	2.1738987498...	2.5405831572...	93.113907425...	2989.6205663...	3190.1795272...	2828.9523315...
+	Samia Refi...		Refining	None	Refinery	2.0241038004...	2.0148796093...	2.6138052758...	93.331915207...	3183.1544955...	3340.8013763...	2984.9175300...

Elements

Event Frames

Library

Unit of Measure

Anacortes Refinery Modified:4/16/2012 8:09:58 PM. Version: 1/1/1970 12:00:00 AM, Revision 1



Home - Home

Regions

Metrics

Libraries

Site Pages

Shared Documents

Lists

Calendar

Tasks

Discussions

Team Discussion

Recycle Bin

All Site Content

UC DEMO

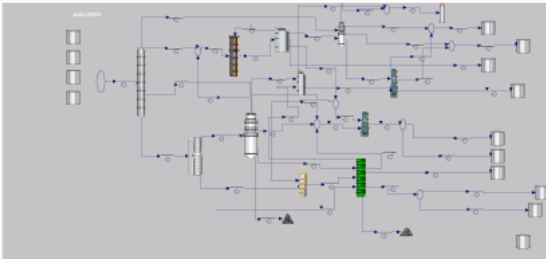
Petrolux

Metrics

Refinery	Power Usage KPI	Power Draw Std	Power Draw Minimum	Power Draw Maximum	Power Draw	Availability	Asset Running	Asset Problems	Asset Maintenance	Asset Down
Sarnia Refinery	8.0407	13.736	2837.5	3341.9	3076.8	184.52	93.525	2.5998	2.0191	1.8483
Sao Paulo Refinery	6.4535	10.112	2717.8	3158.1	2951.1	183.72	93.183	2.5471	2.1438	2.1389
Rotterdam Refinery	8.655	11.967	2834.5	3293	3075.1	183.42	92.902	2.6379	2.9613	1.4749
Martinez Refinery	8.5241	10.221	3008.5	3410.3	3193.5	182.09	92.879	2.1048	2.2589	2.8774
Baton Rouge Refinery	4.0762	8.5166	2675	3034.9	2860.1	184.63	92.759	3.3982	2.76	1.0643
Anacortes Refinery	6.4596	5.2272	1883.3	2101.7	2007	183.25	92.406	3.0565	2.6316	1.9177

PI Graphic

Messages [1]



Home - Home - Windows Internet Explorer

http://ucdemo-webparts/SitePages/Home.aspx

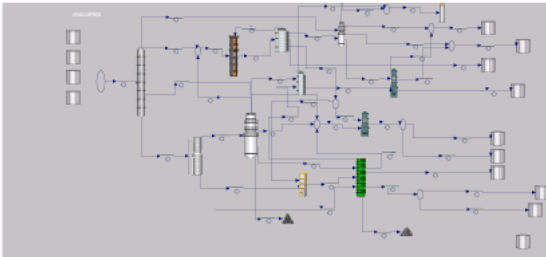
Home - Home

UC DEMO

Site Actions Recycle Bin All Site Content

Browse Page

Messages [1]



PI Table

Region	Total Production	Oil Forecast	Gas Forecast	Fuel Gas	Chemical Use
\E&P\South Region\Field J5	24.085	2928.6	5300	123	435
\E&P\South Region\Field J4	123.22	3666.7	2020	369	1305
\E&P\South Region\Field J3	85.671	3428.6	1900	246	870
\E&P\South Region\Field J2	130.73	3333.3	1800	246	870
\E&P\South Region\Field J1	105.95	3142.9	1600	123	435
\E&P\North Region\Yellow	107.95	3142.9	1600	246	870
\E&P\North Region\Terminal 2D	89.399	3333.3	1643	123	435
\E&P\North Region\Red	77.868	3142.9	1600	246	870

Showing 1 to 8 of 28

Local intranet | Protected Mode: Off





## 2010 R3

Max Point Count	2M+ tags
Point Changes	<10 pt/sec
Startup Time	>20 minutes
Real-time Updates	200K signups
Max Data Rate	<100K ev/sec
Query Throughput	<1M ev/sec
Online Archives	<10K files

5x



## 2012

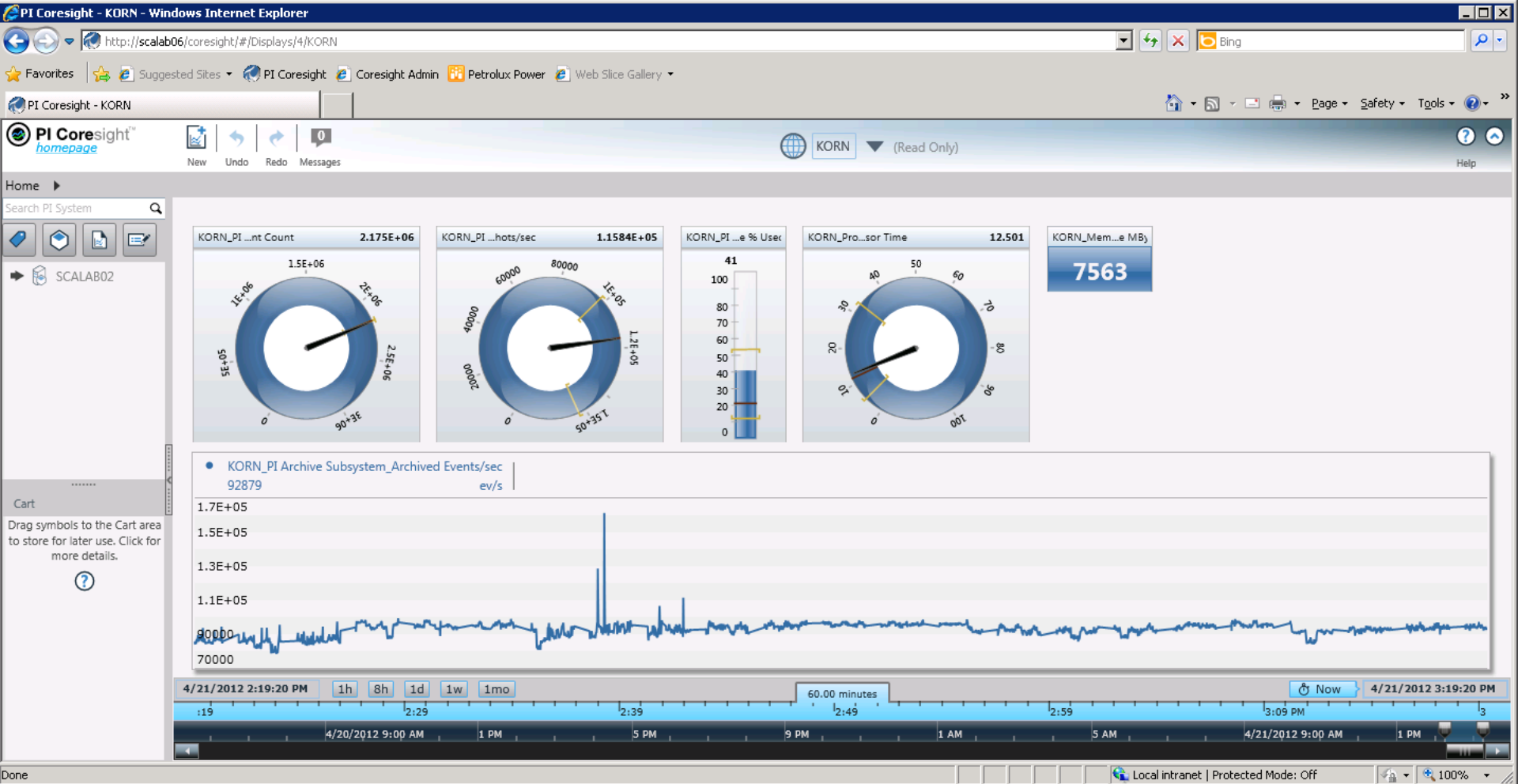
Max Point Count	10M tags
Point Changes	>1,000 pt/sec
Startup Time	<4 minutes
Real-time Updates	>1M signups
Max Data Rate	500K ev/sec
Query Throughput	>5M ev/sec
Online Archives	>50K files

***Be sure to see: Do. More. Faster. Now! PI Server 2012***



# PLEASE PAUSE FOR DEMO

Coresight Display: Scale Lab



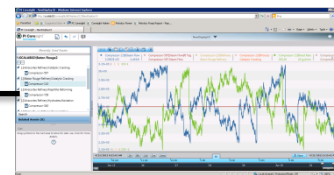
# PI Server 2012 is More Resilient



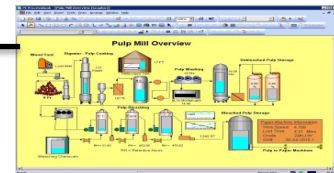
PI Interface



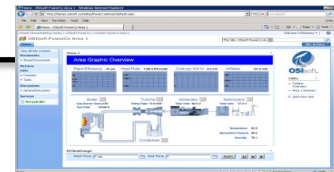
PI Server



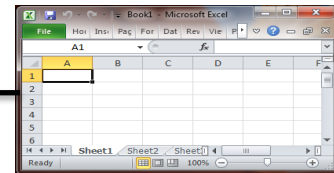
PI Coresight



PI ProcessBook



PI WebParts



PI DataLink



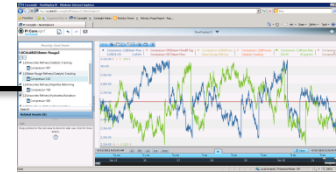
# Resilient During: Restarting from Hard Power Stop



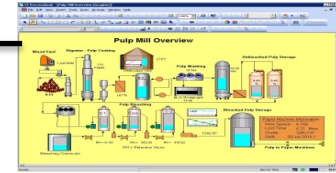
PI Interface



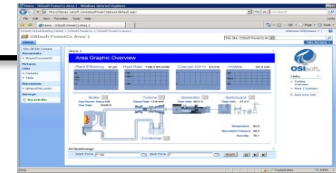
PI Server



PI Coresight



PI ProcessBook

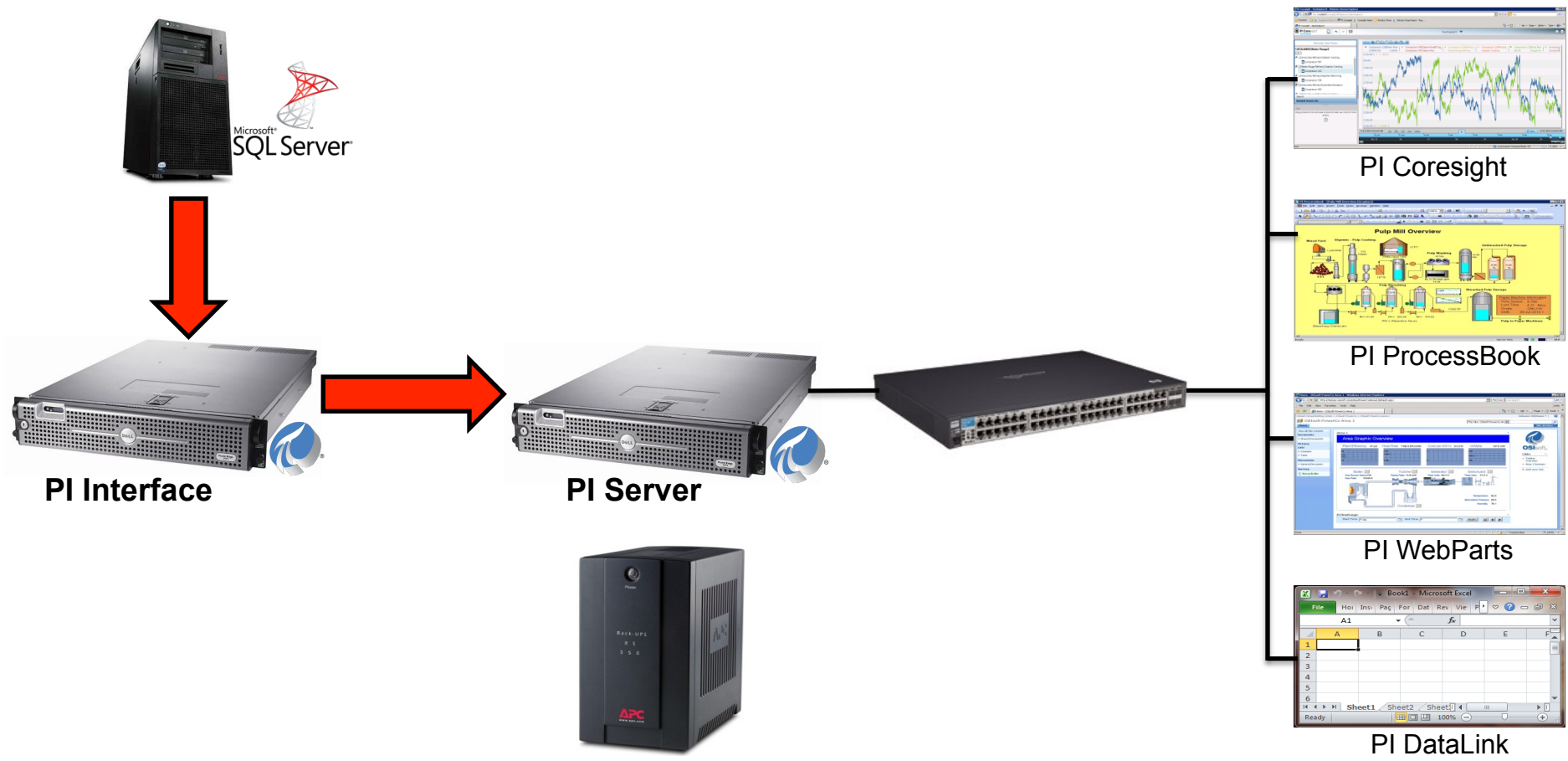


PI WebParts

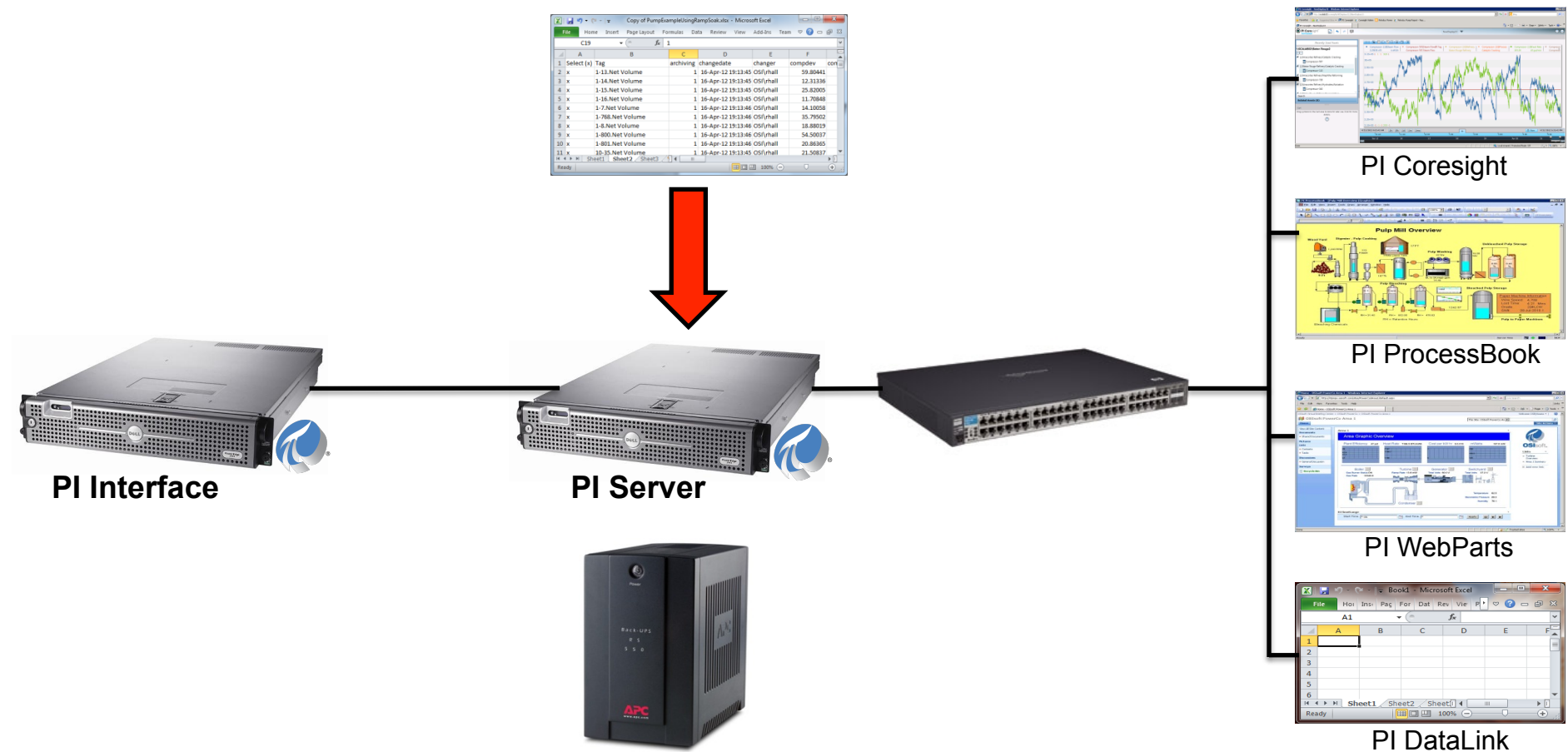
A screenshot of the PI DataLink software interface, showing a Microsoft Excel spreadsheet with data from the PI system.

PI DataLink

# Resilient During: Heavy Backfilling



# Resilient During: Large Point Building Operations



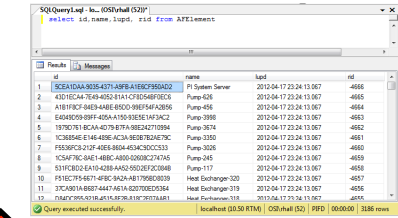
# Resilient During: Large PI OLEDB Queries



PI Interface



PI Server



SQLQuery1.sql - SQL Server Enterprise Edition

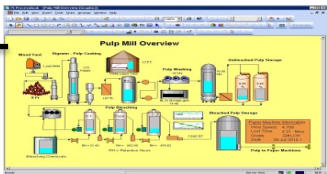
```
select id, name, logid, pid from ATElement
```

id	name	logid	pid
1	ACEA1DAA-9035-437F-A9FB-A1E6C7950A22	PI System Server	2012-04-17 23:24 13:067
2	43D1E2C4-7E49-4052-E1A3-C1E548F9E0C6	Pump-626	2012-04-17 23:24 13:067
3	A1B1B2C7-94E3-4A8E-8E0D-98F74F420B06	Pump-456	2012-04-17 23:24 13:067
4	6A04C09-89FF-420A-A150-9E9E5F34C2	Pump-3980	2012-04-17 23:24 13:067
5	1970C7B1-8E2A-4D79-87FA-9B82A77099A4	Pump-3676	2012-04-17 23:24 13:067
6	1C355A6E-E146-4946-AC3A-B5B876A67C7C	Pump-3350	2012-04-17 23:24 13:067
7	F558FC68-212F-42E8-8804-4D4C8DCC5331	Pump-3026	2012-04-17 23:24 13:067
8	425A77C7-94E1-486C-A8D0-0200C2747676	Pump-245	2012-04-17 23:24 13:067
9	S31FCB02-6A19-42B8-A452-95D2E7CC384B	Pump-117	2012-04-17 23:24 13:067
10	F51EC7F5-6671-49FC-9A26-A817996D0839	Heat Exchanger-020	2012-04-17 23:24 13:067
11	37C4A81A-88E7-4A47-A15A-82E7B8E2C054	Heat Exchanger-019	2012-04-17 23:24 13:067
13	7D47C7F5-9531B-4F15-8F3B131C-30173A81	Heat Exchanger-018	2012-04-17 23:24 13:067

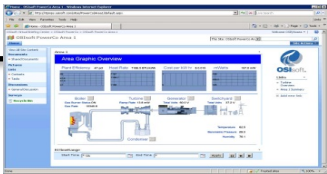
Query executed successfully. localhost (0.50 RTM) | OLEDB (32) | PID: 00:00:00 | 3186 rows



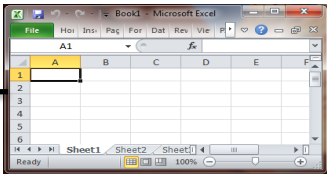
PI Coresight



PI ProcessBook



PI WebParts



PI DataLink

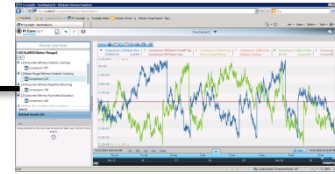
# Resilient During: Network Disruption, Reconnection



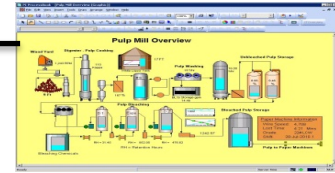
PI Interface



PI Server



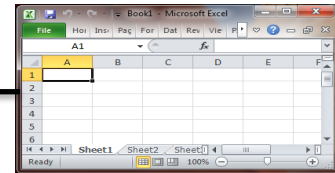
PI Coresight



PI ProcessBook

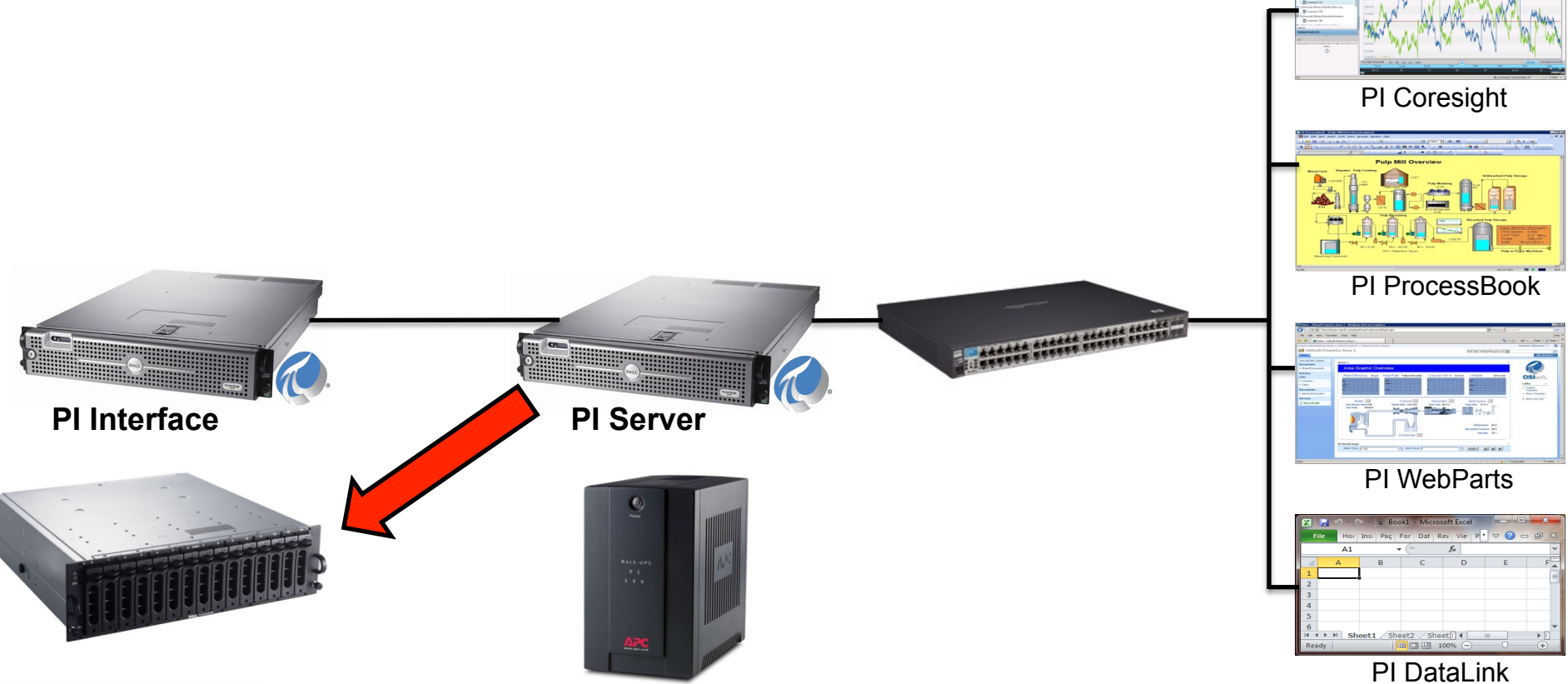


PI WebParts



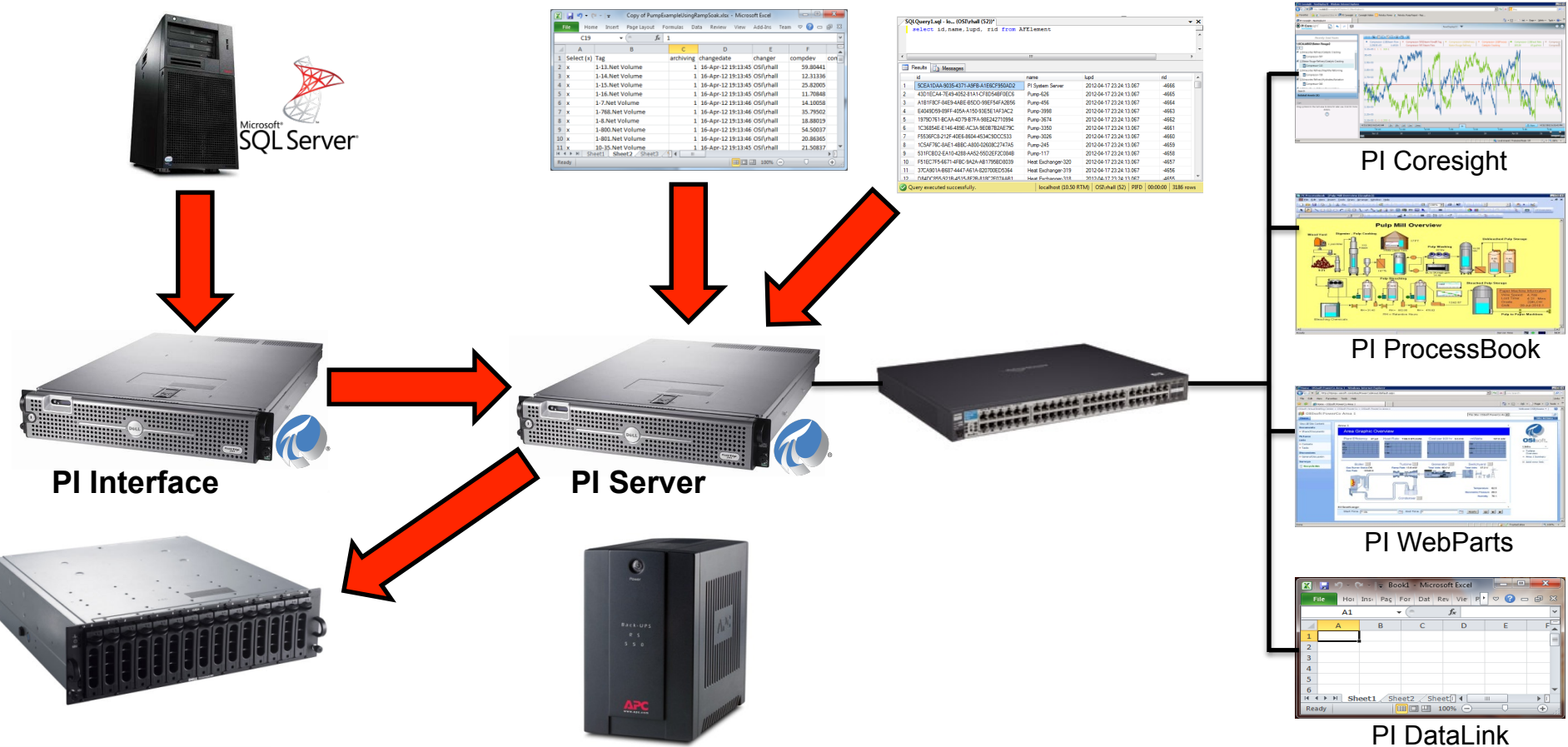
PI DataLink

# Resilient During: Backup Operations





# Resilient During: Several Events at the Same Time

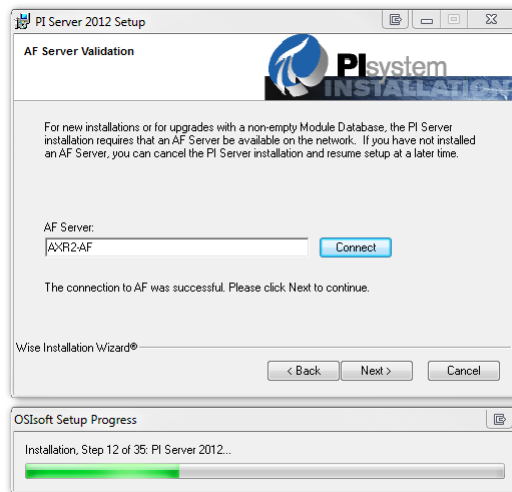




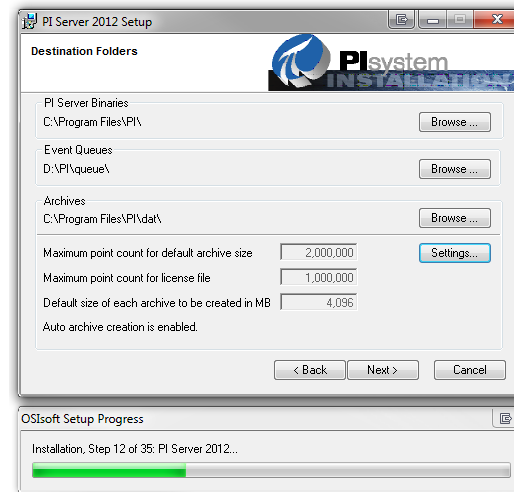
# PI Server 2012 Setup



1



2



3

# DATA BACKFILLING



*Historical Data  
in  
Legacy System*

Archive File	Status	Start Time	End Time
C:\Program Files\PI\dat\piarch.001	Primary	4/21/2012 7:30:52 AM	Current Time
C:\Program Files\PI\dat\piarch.002	Has Data	4/19/2012 12:47:44 PM	4/21/2012 7:30:52 AM
C:\Program Files\PI\dat\piarch.003	Has Data	4/18/2012 3:51:16 AM	4/19/2012 12:47:44 PM

# DATA BACKFILLING



## 2010 R3

1	Create PI Points	minutes
2	Delete Pt. Created	hours
3	Check Disk Space	minutes
4	Reprocess Archives	weeks
5	Create New Archives	hours
6	Backfill Data	days
Total		weeks



## 2012

1	Create PI Points	minutes
2	Check Disk Space	minutes
3	Create New Archives	hour
4	Backfill Data	hours
Total		hours

# Petrolux Value from PI Server 2012

- **Simplified** Installation, Automatic Backfilling
- Very high **Scale** for growth
- **Faster** queries and response
- More **Resilient** during atypical scenarios

# Mission Critical and Strategic

- Resource Scheduling
- Environmental Reporting
- Energy and Oil trading
- Crude Accounting
- Real Time Response to Markets
- Constraint Management
- Batch Release
- Prediction Scheduling
- Power Up Sequencing
- Quality Management
- Responding to Faults
- Production Planning and Forecasting
- Unit Oversight
- Crisis Management and Diagnosis

# Conversation with Rachel

- How many PI System components do you monitor?
- What are typical problems you see?
- How do you address them, and customer exper?
- How important is PI Server uptime to you?
- How did your upgrade to PI Server 2012 Beta go?

# Our Demonstrations



- **PI Server 2012** **Beta**
- **PI Asset Framework 2012** **Beta**
- **PI Notifications 2010** **Released**
- **PI OLEDB Enterprise 2012** **Alpha**
- **Event Frame Gen Interface** **Alpha**
- **PI ProcessBook 2012** **Released**
- **PI Coresight 2012** **Beta**
- **PI DataLink 2012** **Beta**
- **PI Web Parts 2010** **Released**



# Our Demonstrations



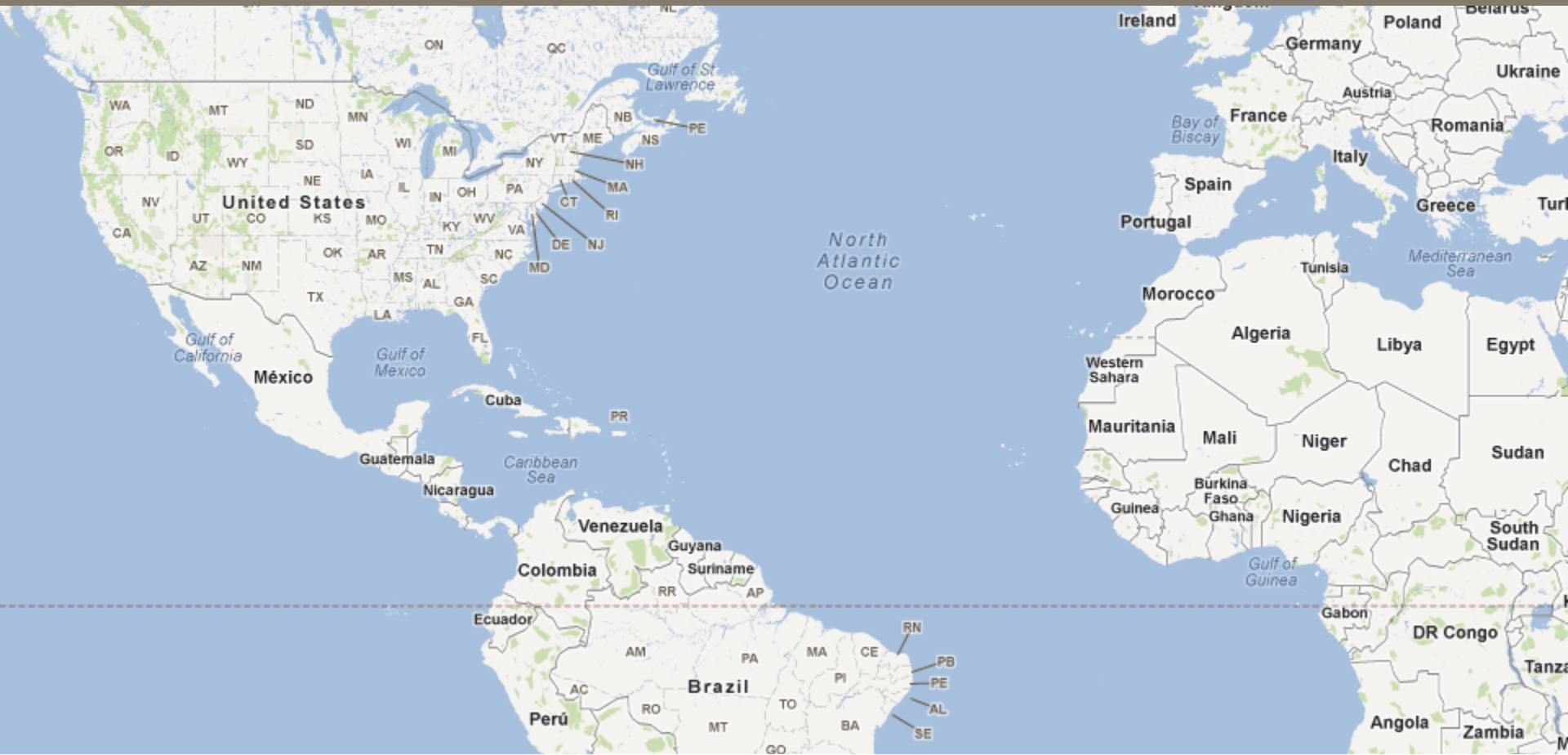
- **PI Server 2012** **Release in Q3**
- **PI Asset Framework 2012** **Release in Q3**
- **PI Notifications 2010** **Released**
- **PI OLEDB Enterprise 2012** **Release in Q3**
- **Event Frame Gen Interface** **Release in Q3**
- **PI ProcessBook 2012** **Released**
- **PI Coresight 2012** **Release in Q2**
- **PI DataLink 2012** **Release in Q3**
- **PI Web Parts 2010** **Released**



# PLEASE PAUSE FOR DEMO

Coresight on iPad

## As You Go Through Your PI Journey....





# THANK YOU

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