OSIsoft®

REGIONAL SEMINARS 2012

The Power of Data

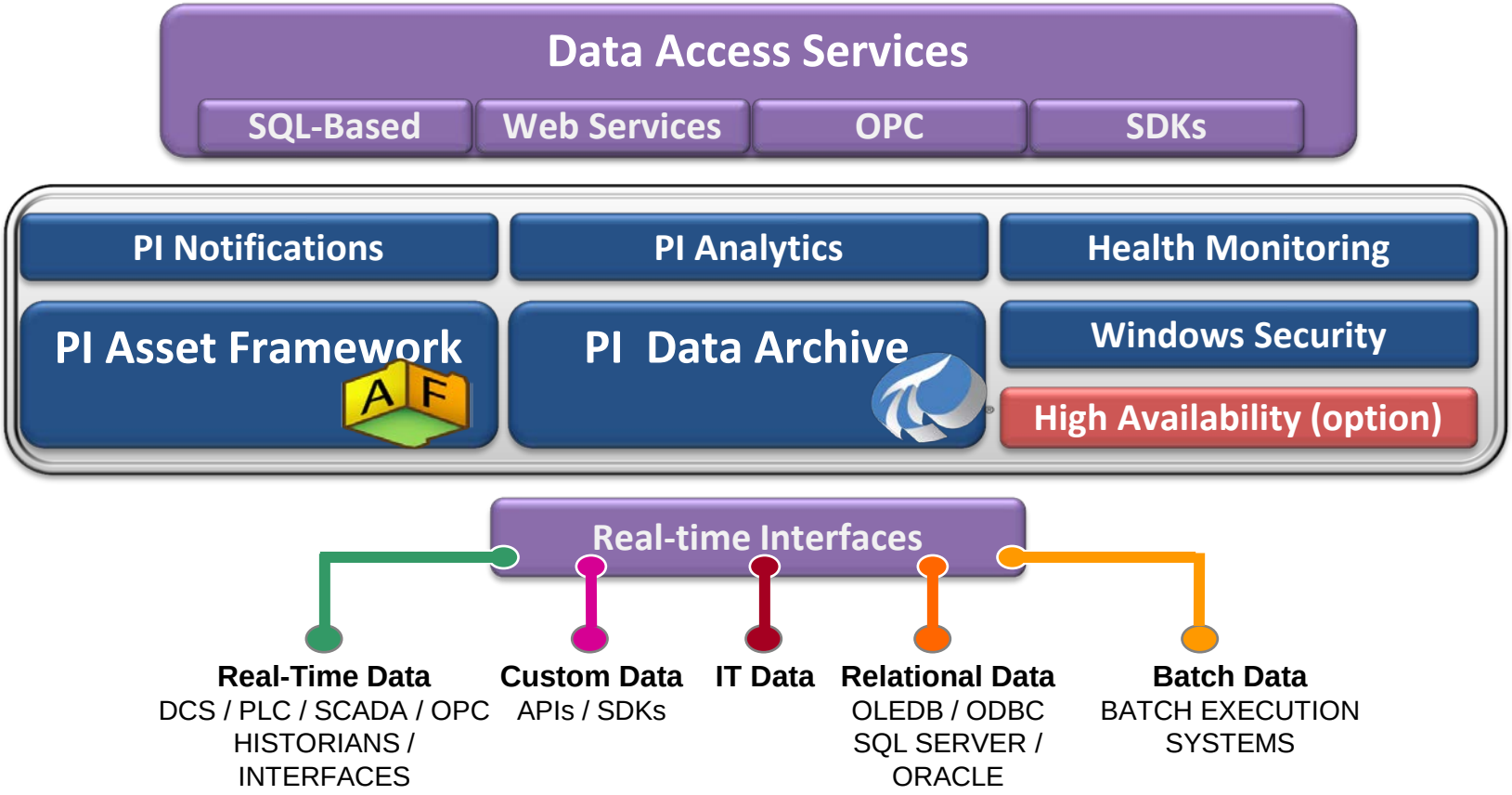
PI System 2012

Now and Beyond

Presented by **Chris Ong**

OSIsoft

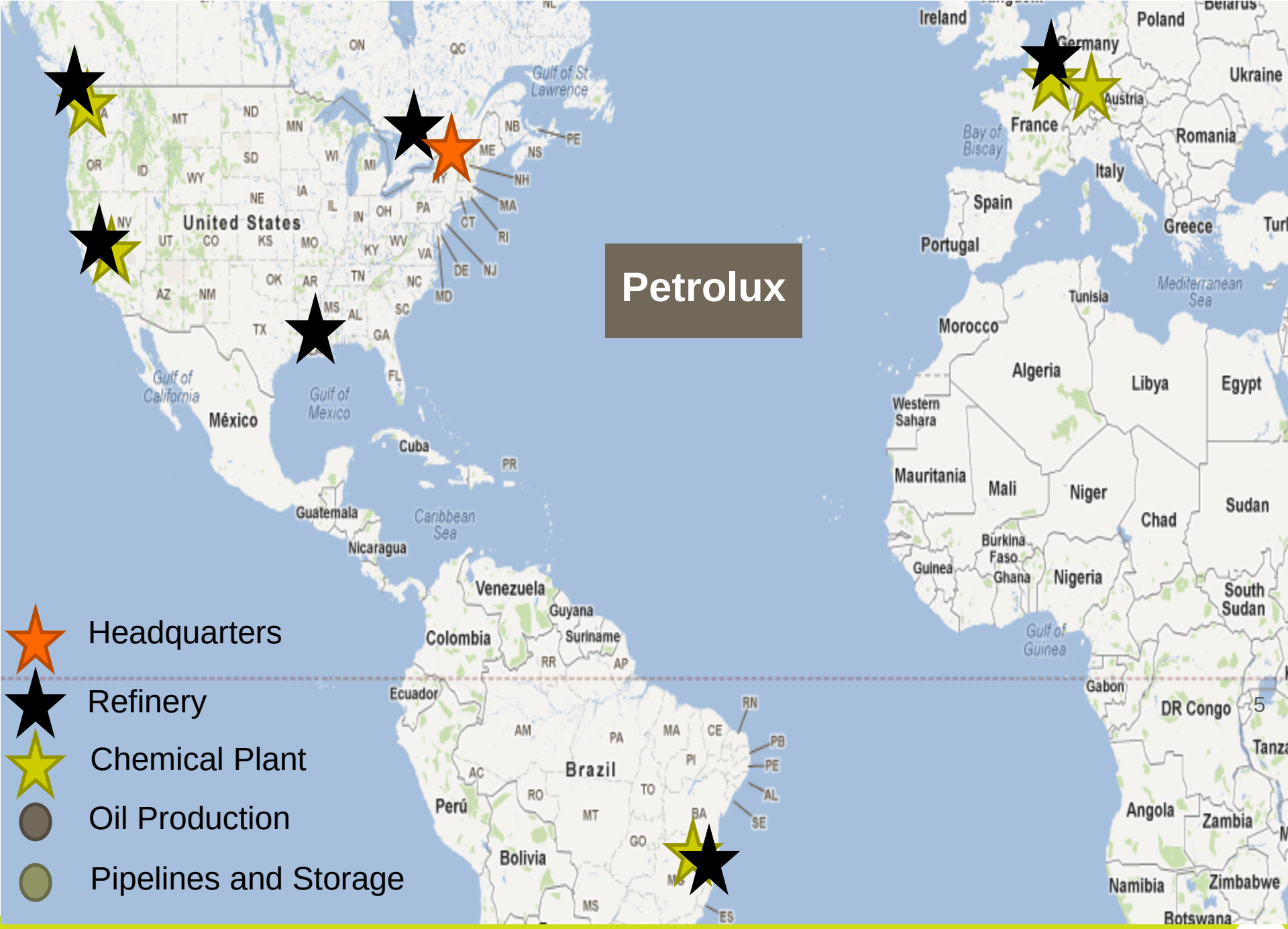
PI System Overview

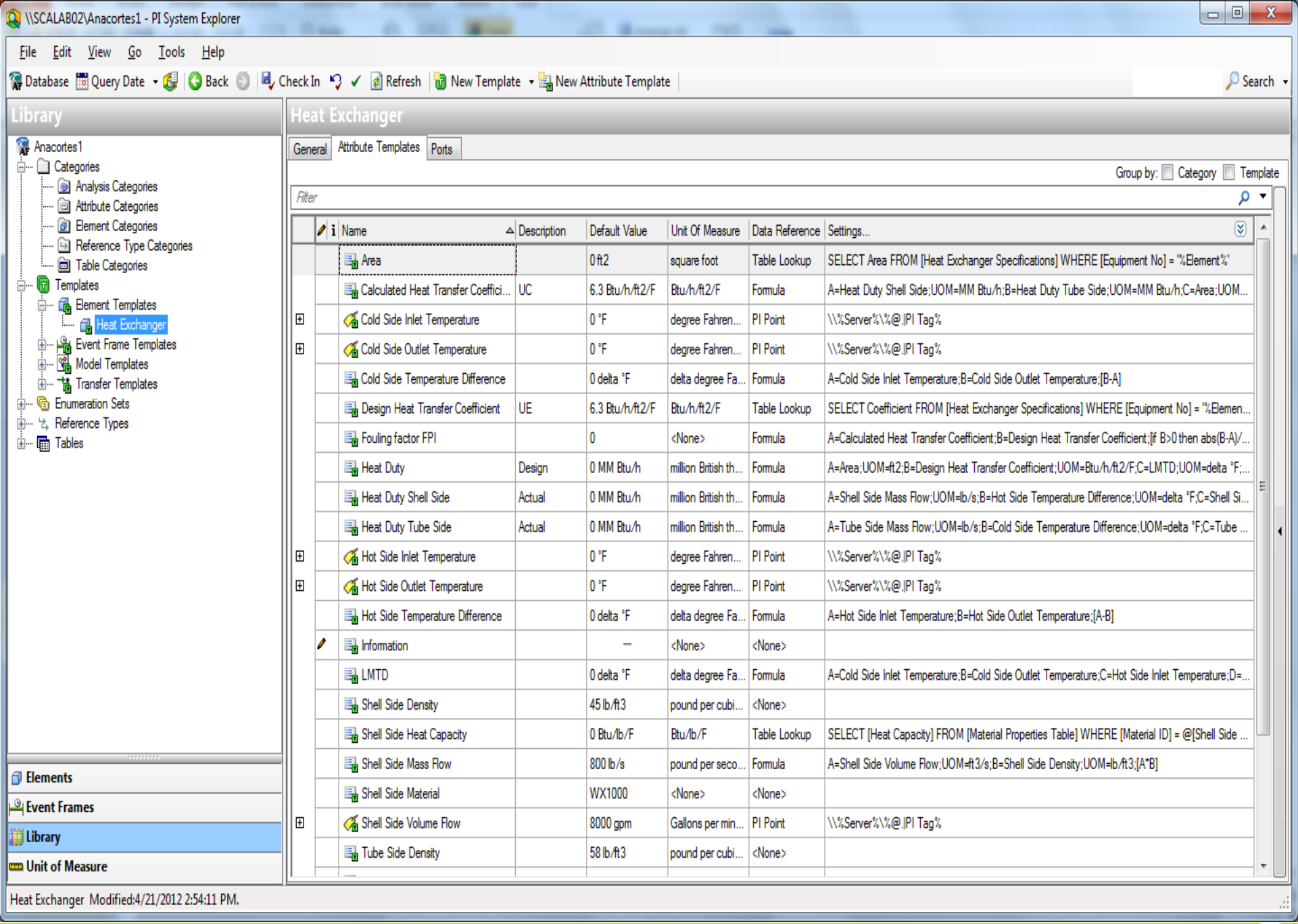


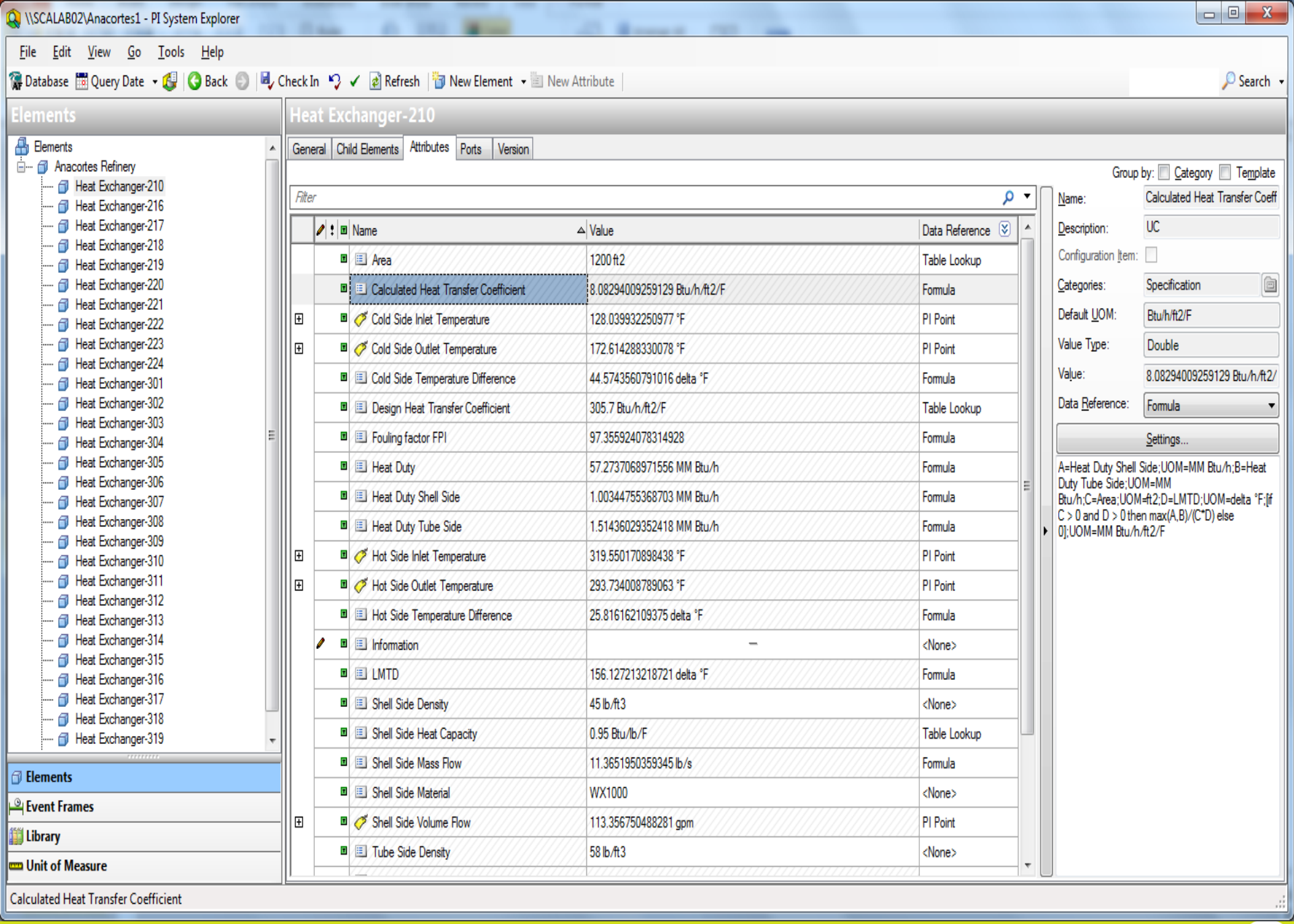
Disclaimer

This story is not yet rated

No animals were harmed in the process of this story. All characters and entities portrayed in this story are fictitious. Any resemblance to real persons, living or dead is purely coincidental.





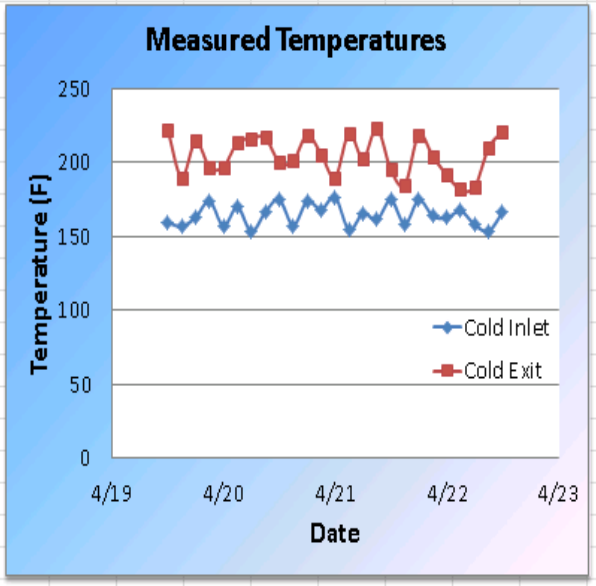


Anacortes1 Heat Exchangers - Microsoft Excel

File | Home | Insert | Page Layout | Formulas | Data | Review | View | PI DataLink | PI AF Builder

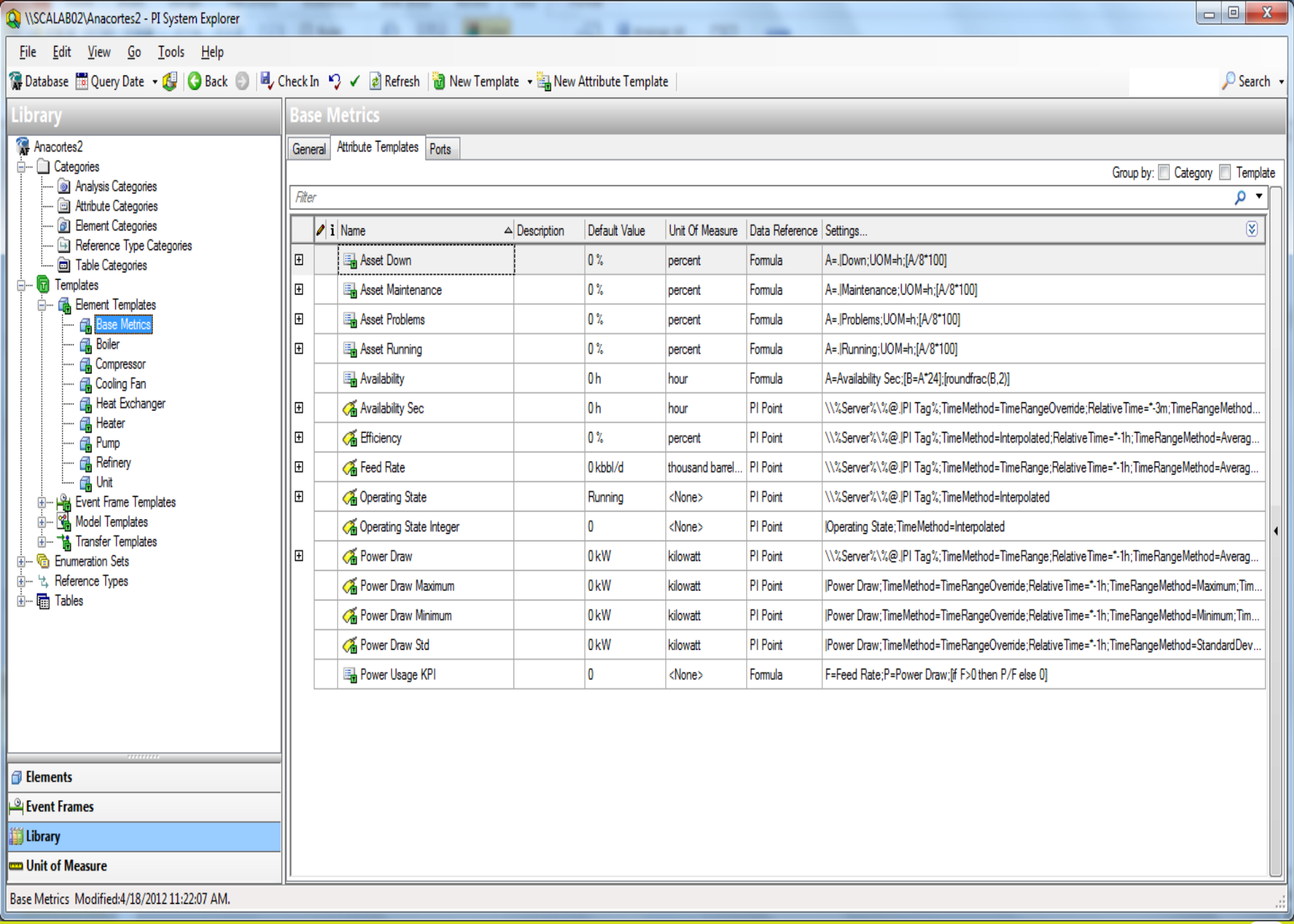
B16: Hot Side Inlet Temperature

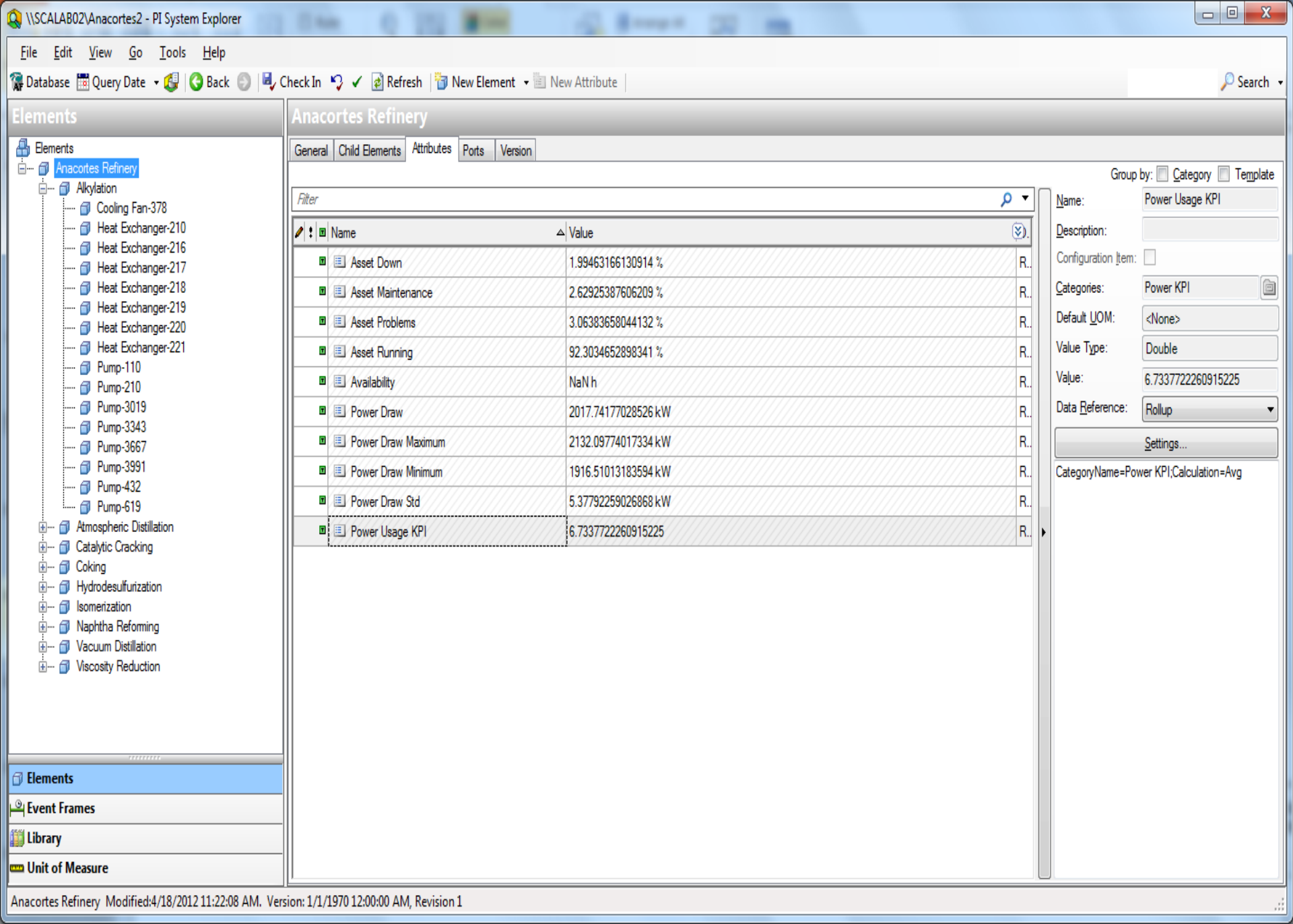
	A	B	C	D	E	F	G	H
2	Site:	Anacortes Refinery						
4	Heat Exchanger Name:	Heat Exchanger-309		Current Value			Min	Max
6	Properties:	Area	Jan-01, 12:00 AM	1200.00	ft2		1200	1200
7		Calculated Heat Transfer Coefficient	Apr-22, 11:50 AM	11.55	Btu/h/ft2/F			
8		Cold Side Inlet Temperature	Apr-22, 11:50 AM	165.01	°F		147	180.9
9		Cold Side Outlet Temperature	Apr-22, 11:50 AM	219.11	°F		180.4	228.5
10		Cold Side Temperature Difference	Apr-22, 11:50 AM	54.10	delta °F			
11		Design Heat Transfer Coefficient	Jan-01, 12:00 AM	301.40	Btu/h/ft2/F		301.4	301.4
12		Fouling factor FPI	Apr-22, 11:50 AM	96.17				
13		Heat Duty	Apr-22, 11:50 AM	66.58	MM Btu/h			
14		Heat Duty Shell Side	Apr-22, 11:50 AM	-0.10	MM Btu/h			
15		Heat Duty Tube Side	Apr-22, 11:50 AM	2.55	MM Btu/h			
16		Hot Side Inlet Temperature	Apr-22, 11:50 AM	376.38	°F		307.3	427.1
17		Hot Side Outlet Temperature	Apr-22, 11:50 AM	378.79	°F		282	394.7
18		Hot Side Temperature Difference	Apr-22, 11:50 AM	-2.40	delta °F			
19		LMTD	Apr-22, 11:50 AM	184.08	delta °F			
20		Shell Side Density	Jan-01, 12:00 AM	45.00	lb/ft3		45	45
21		Shell Side Heat Capacity	Jun-25, 08:24 AM	0.95	Btu/lb/F		0.95	0.95
22		Shell Side Mass Flow	Apr-22, 11:50 AM	11.97	lb/s			
23		Shell Side Material	Jan-01, 12:00 AM	WX1000				
24		Shell Side Volume Flow	Apr-22, 11:50 AM	119.40	gpm		95.67	131
25		Tube Side Density	Jan-01, 12:00 AM	58.00	lb/ft3		58	58
26		Tube Side Heat Capacity	Jun-25, 08:24 AM	0.89	Btu/lb/F		0.885	0.885
27		Tube Side Mass Flow	Apr-22, 11:50 AM	14.81	lb/s			
28		Tube Side Material	Jan-01, 12:00 AM	HC1500				
29		Tube Side Volume Flow	Apr-22, 11:50 AM	114.58	gpm		85.42	121.7

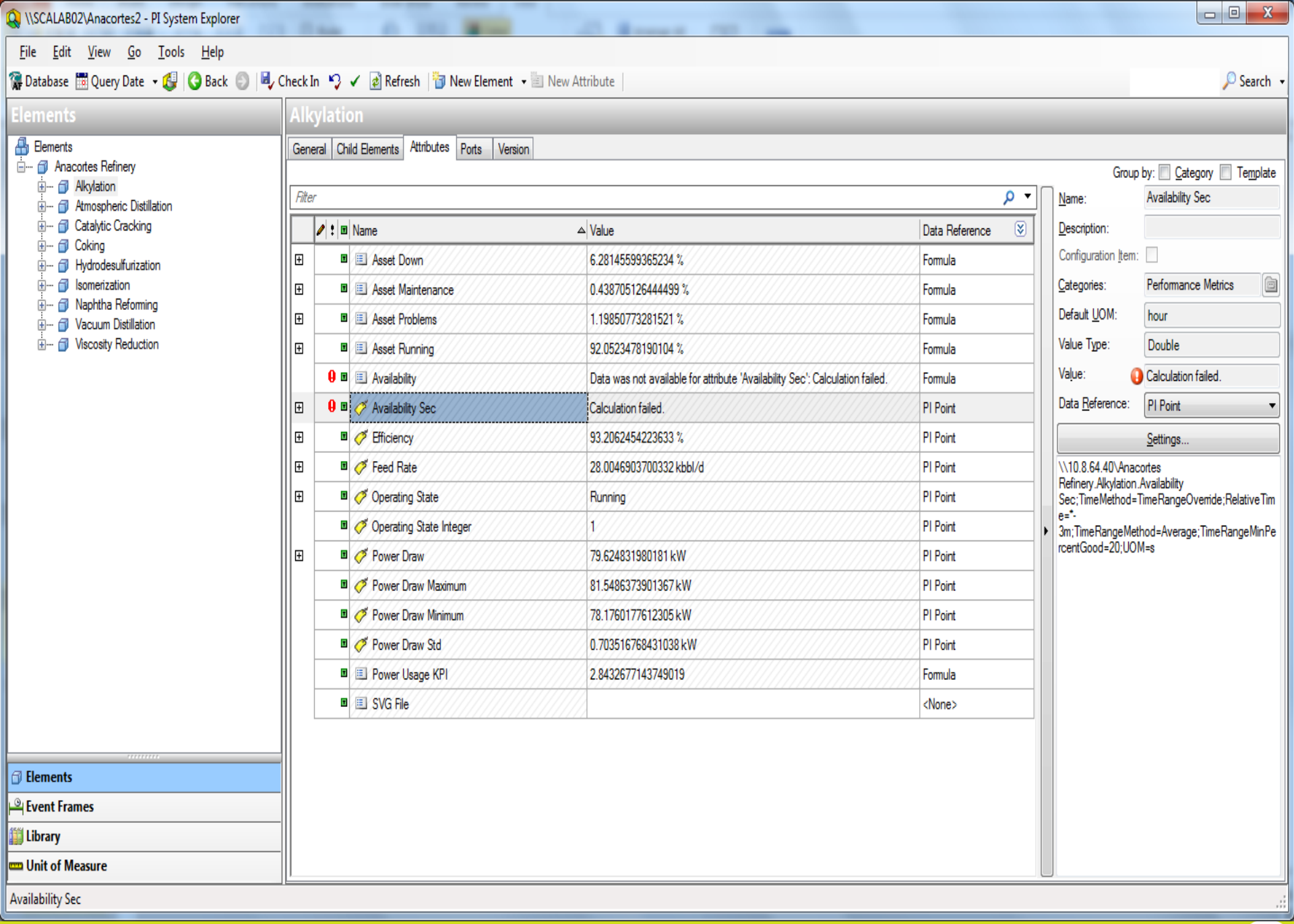


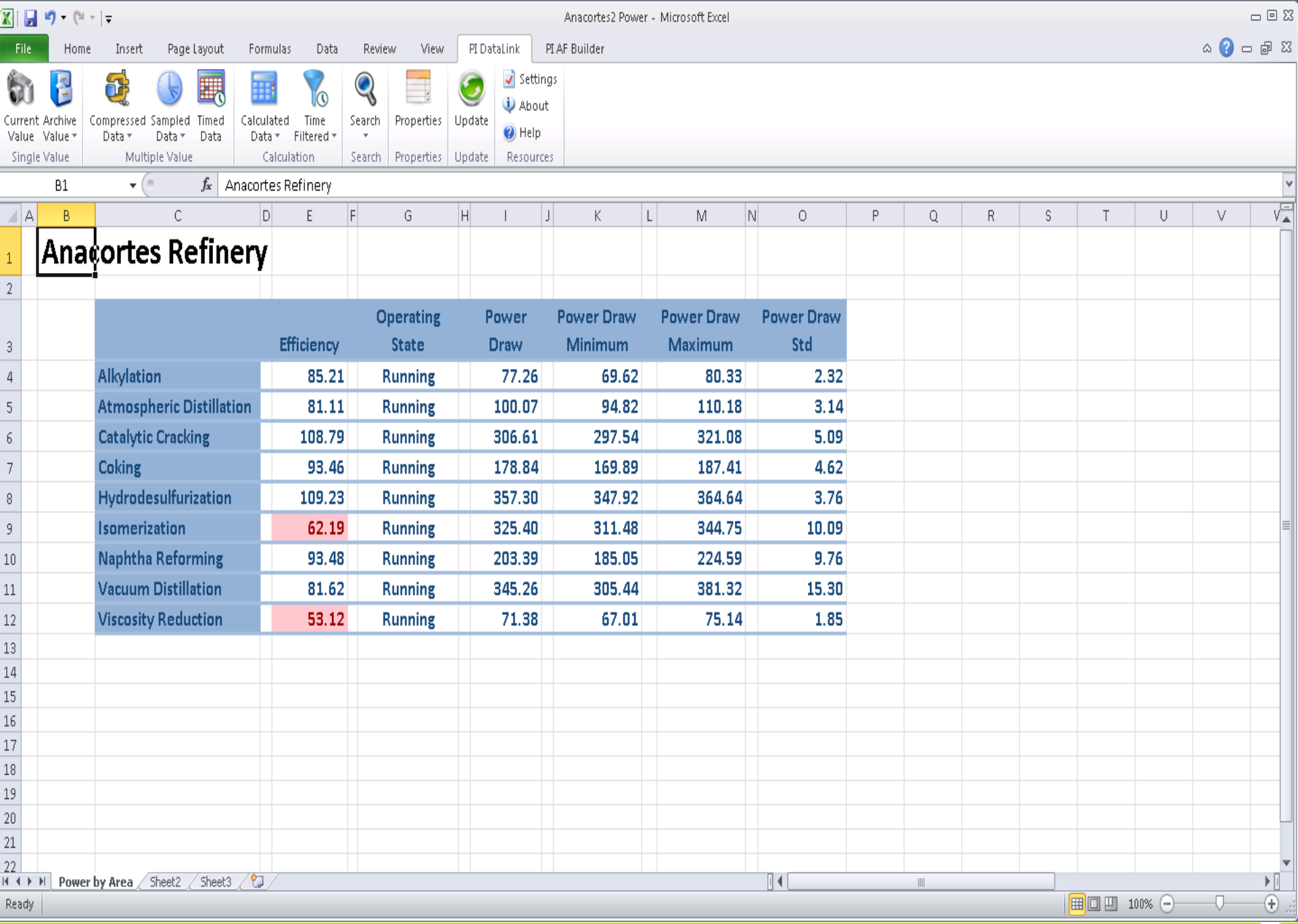
Heat Exchangers | Multi-site plus pumps | Sheet3

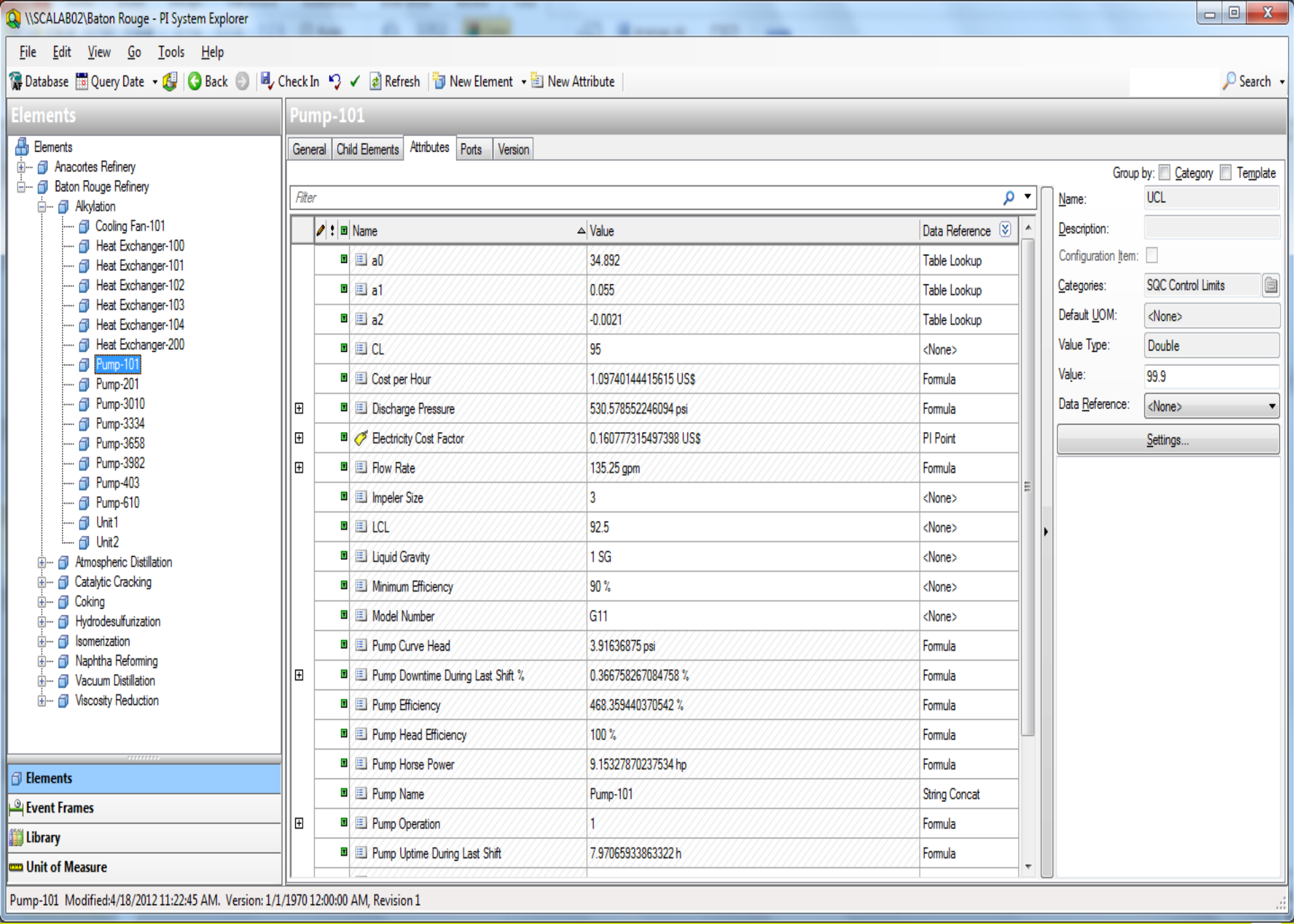
Ready

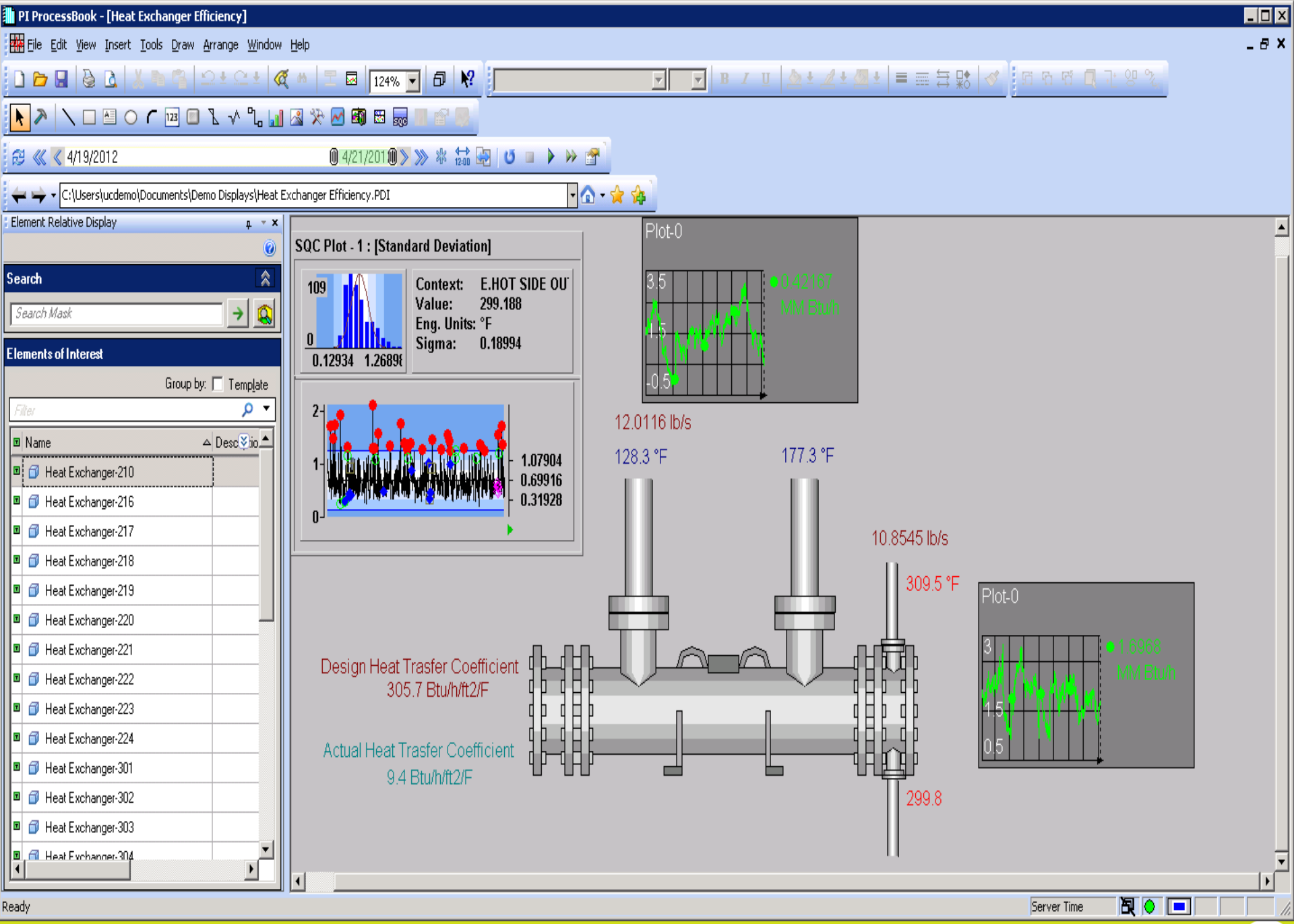


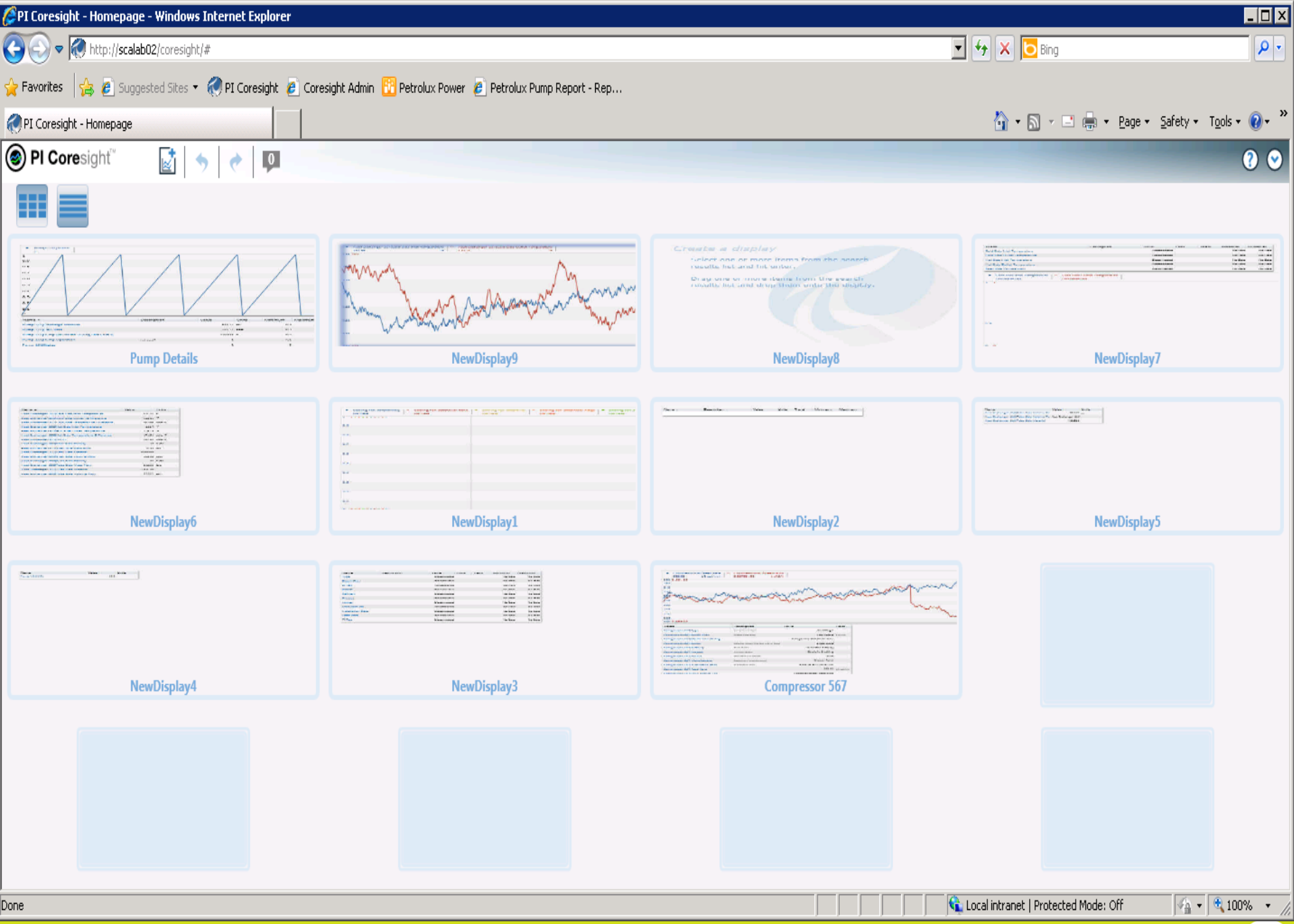


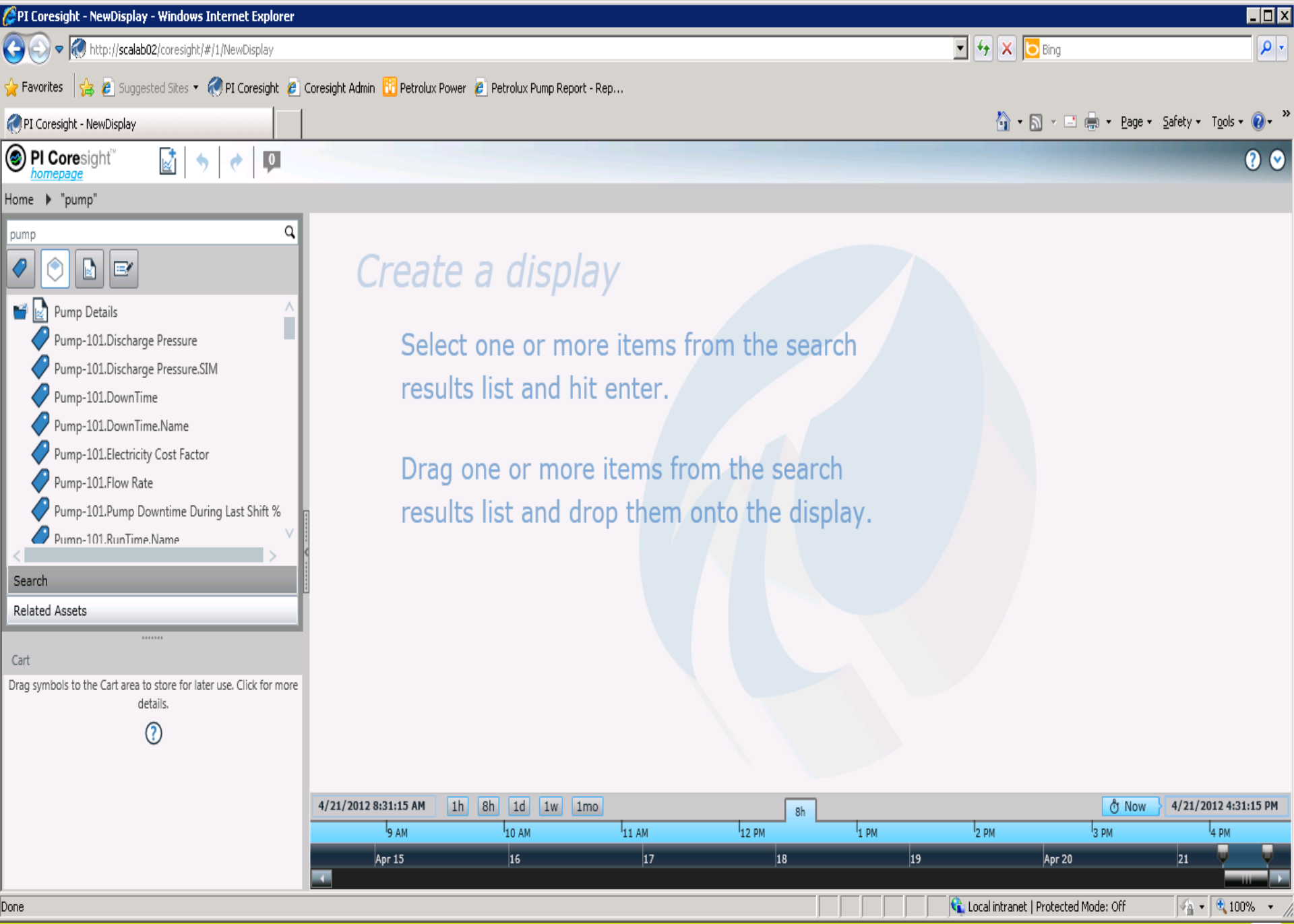


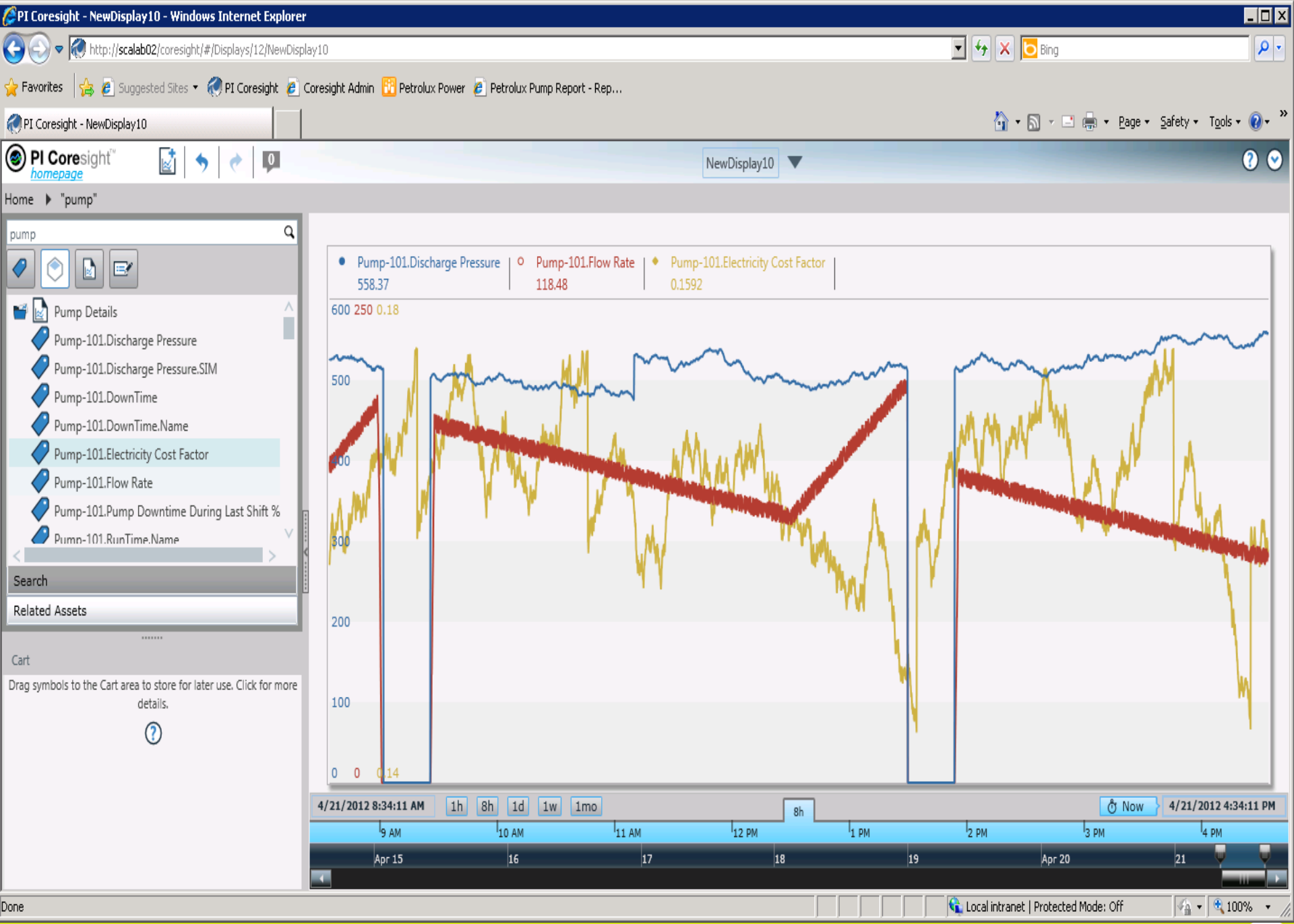


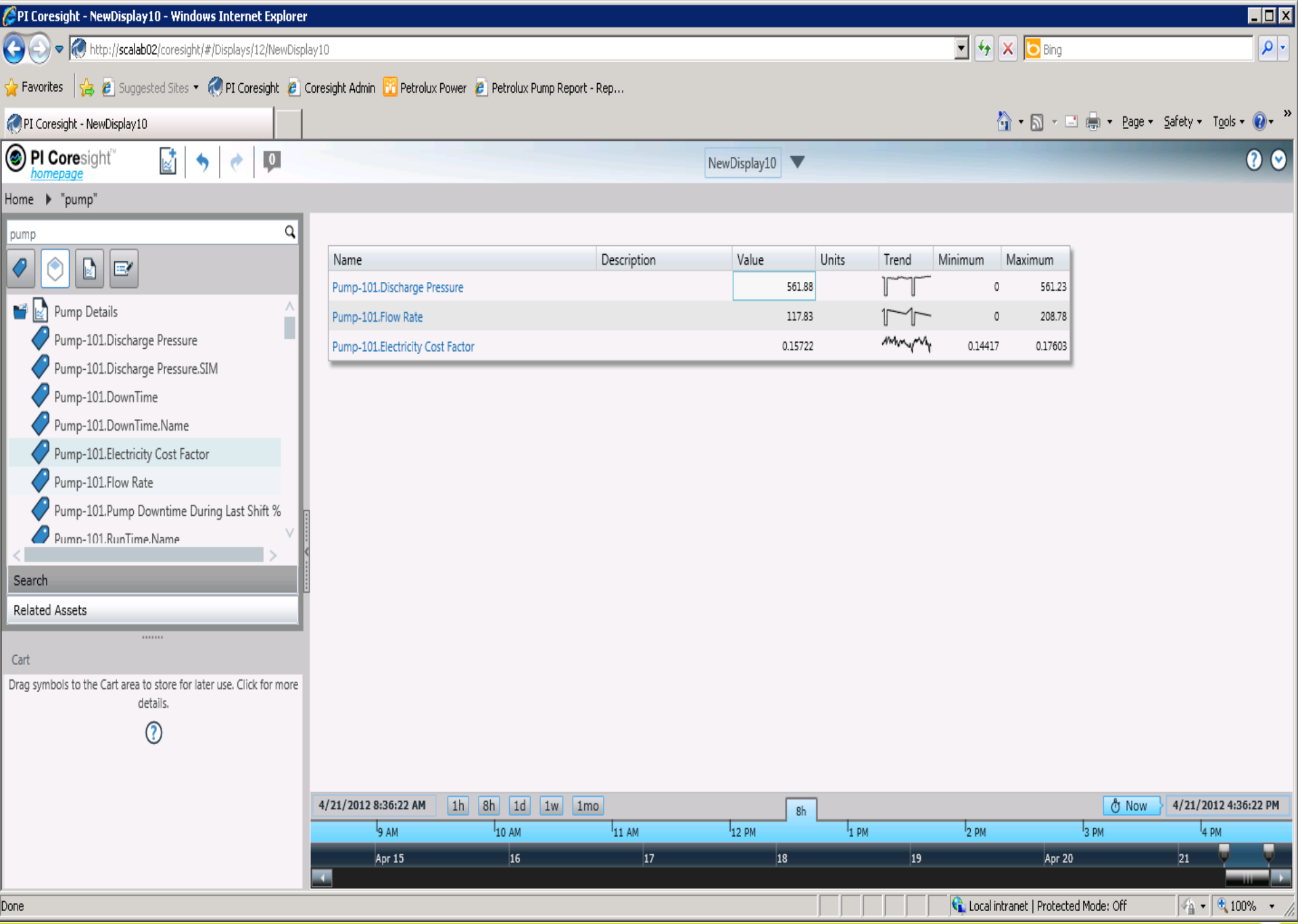


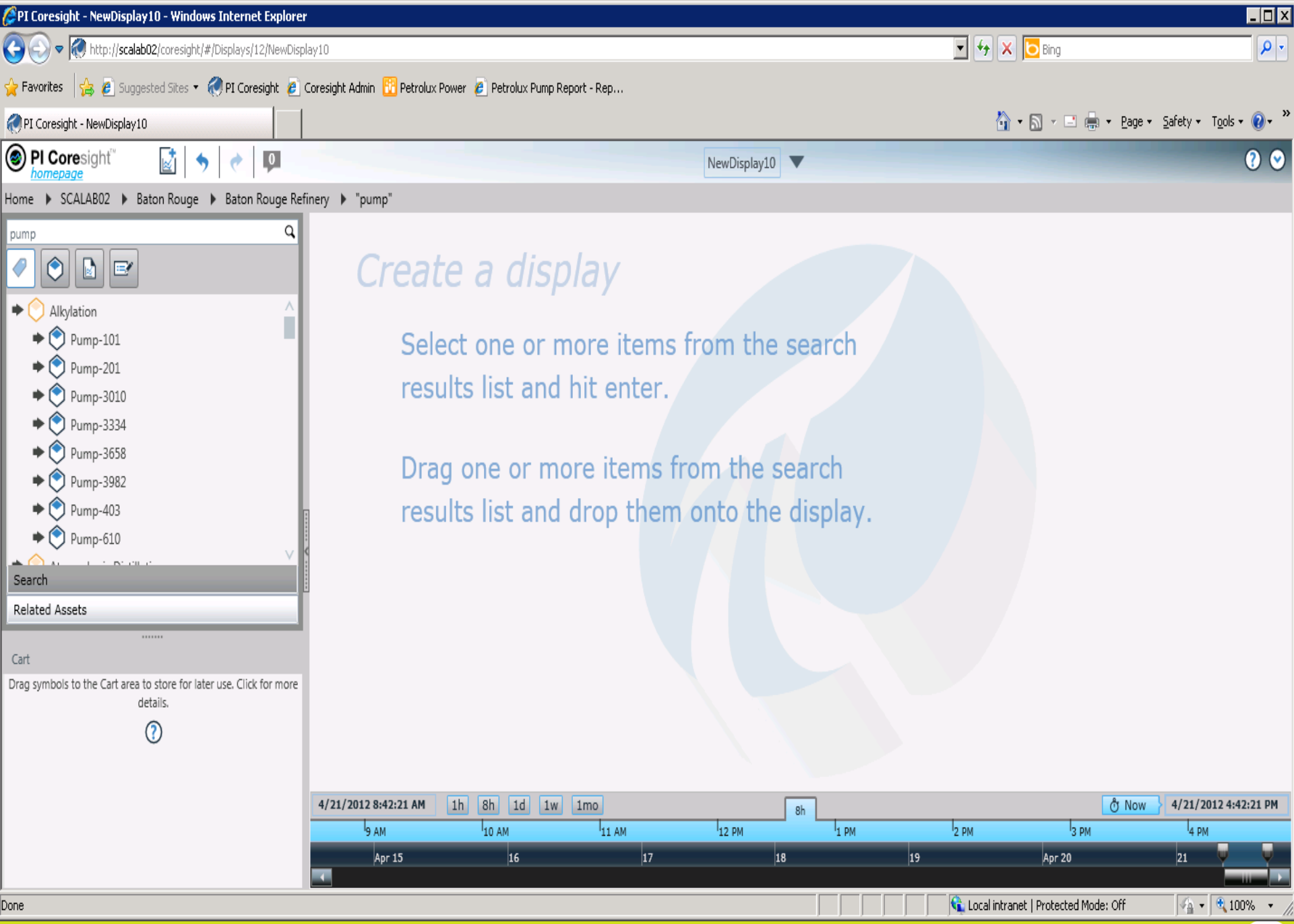


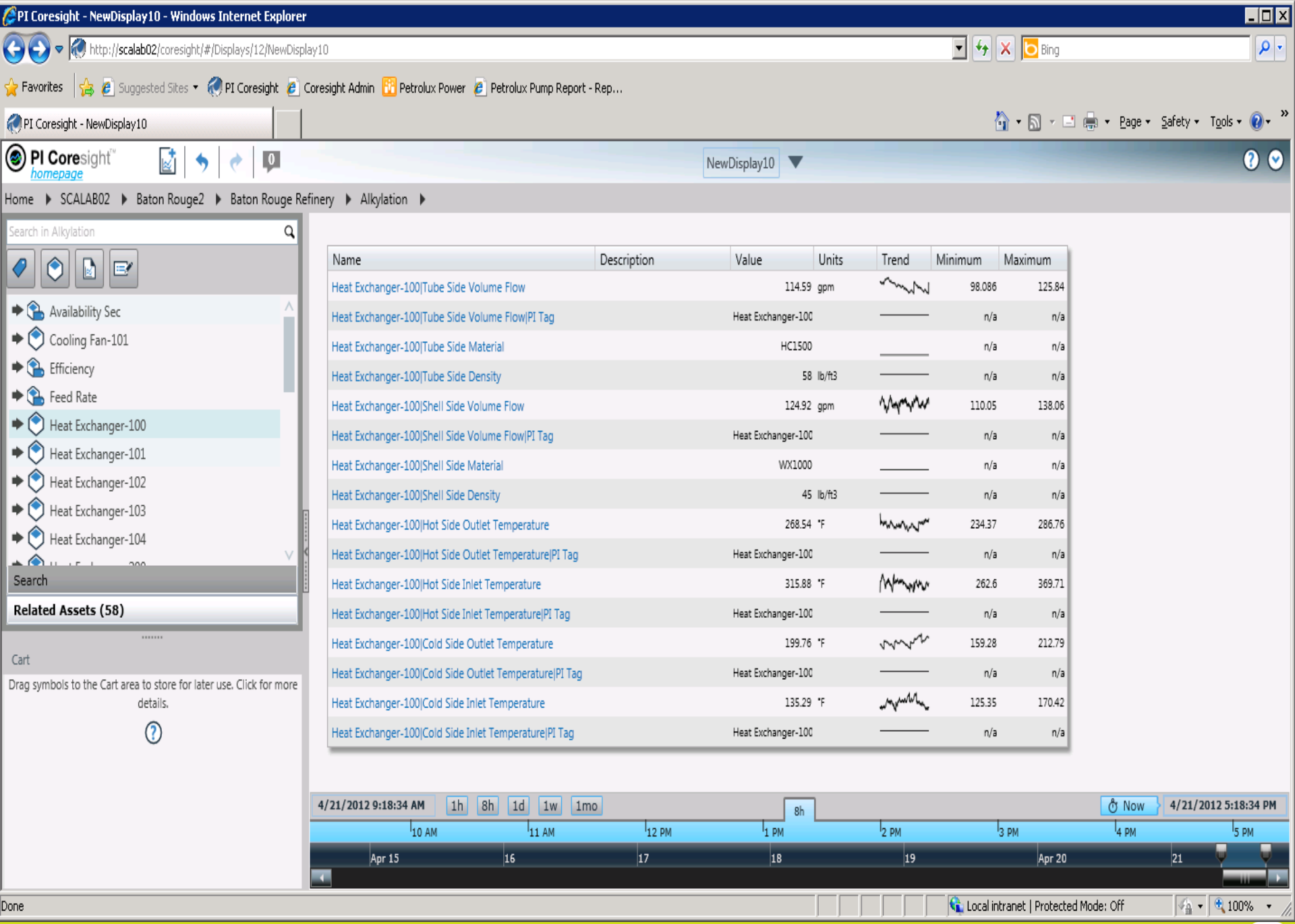


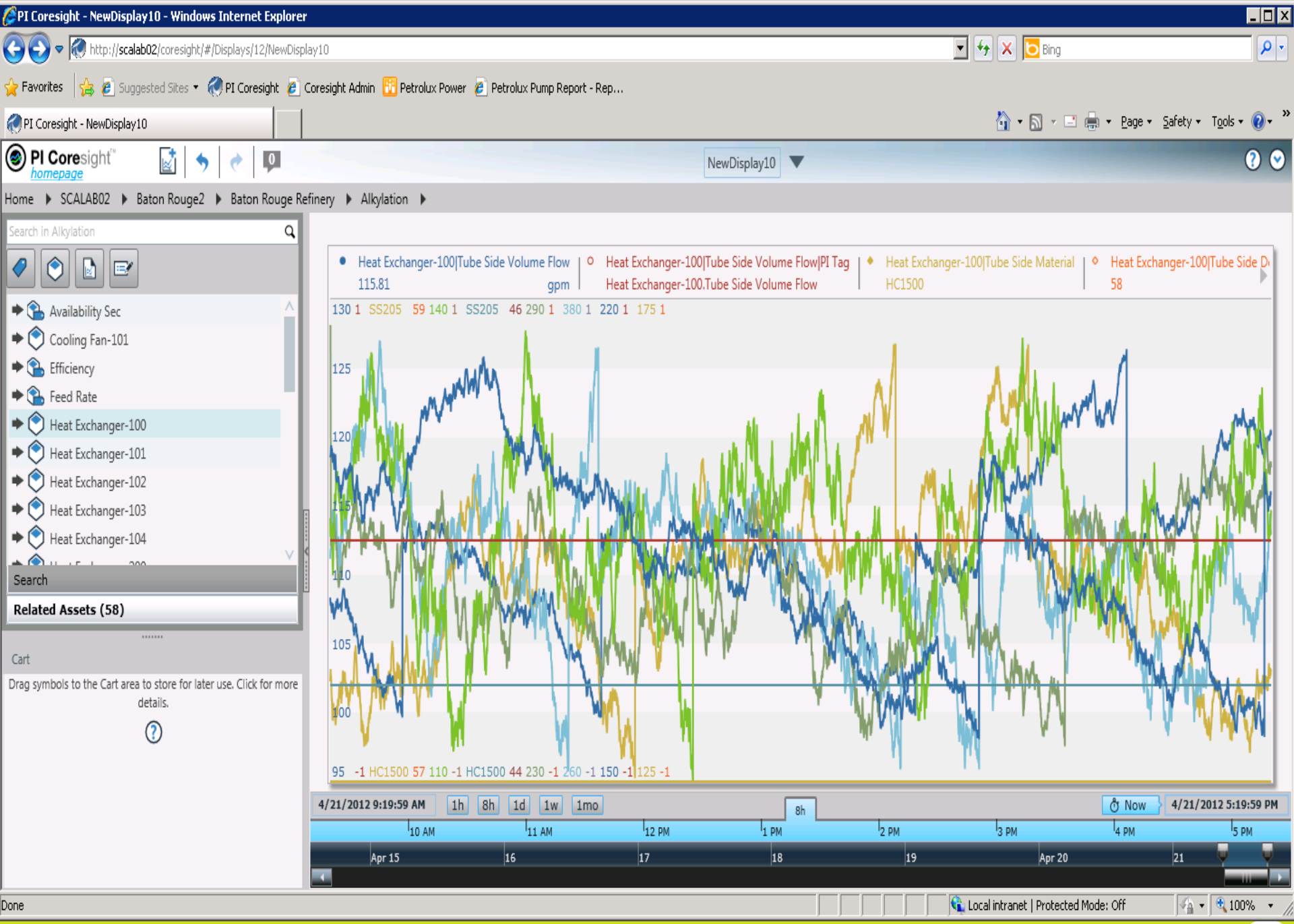


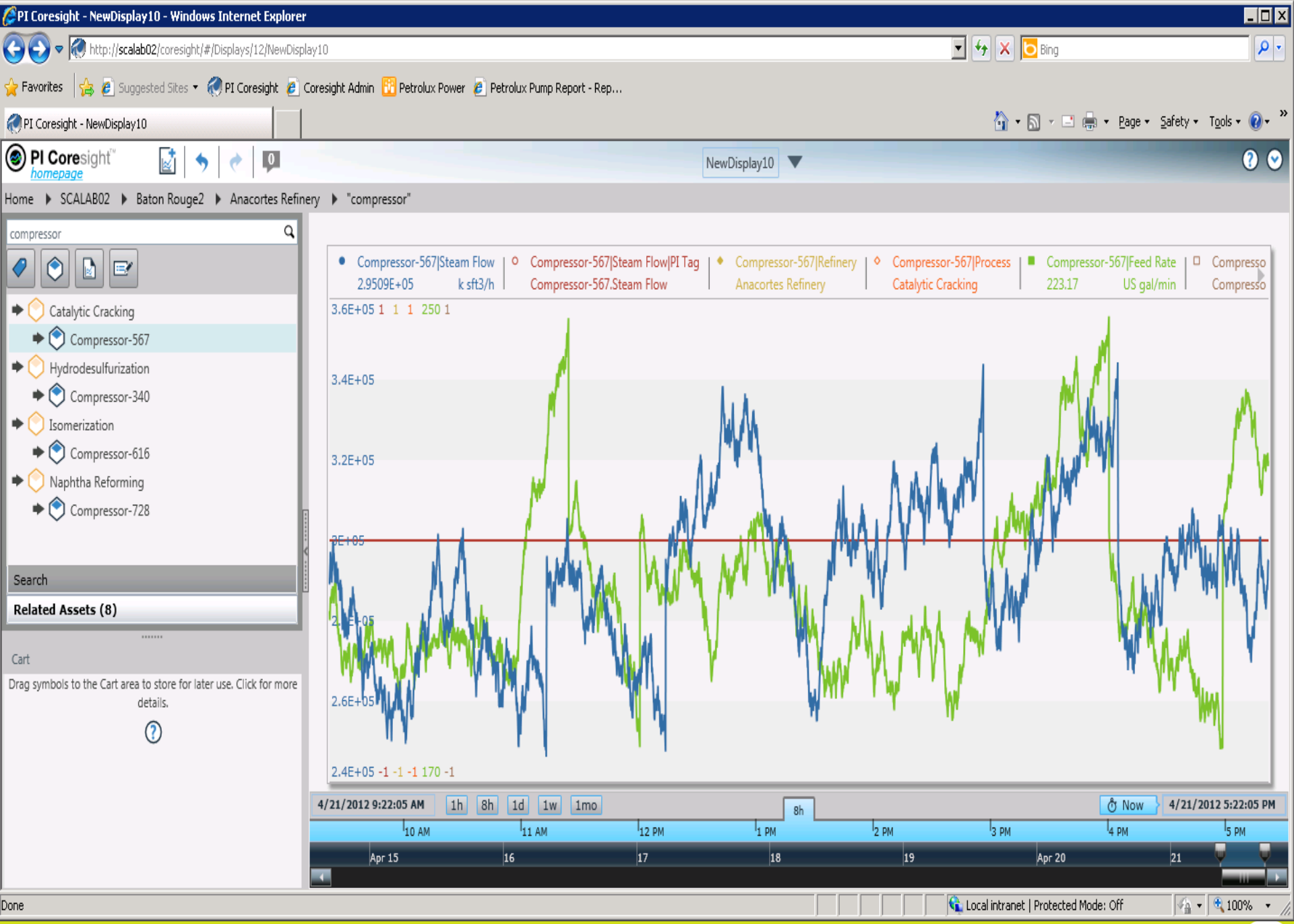


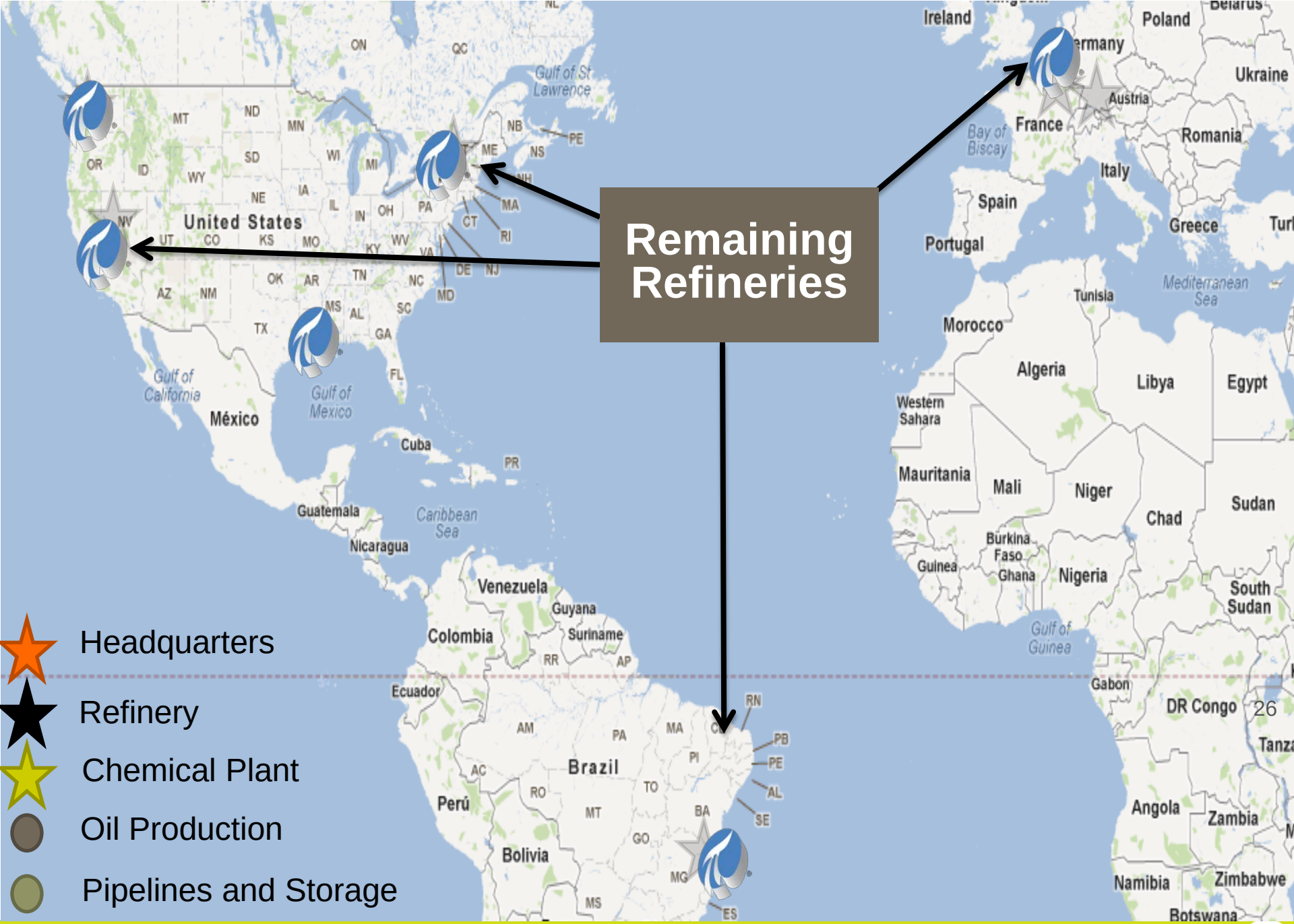




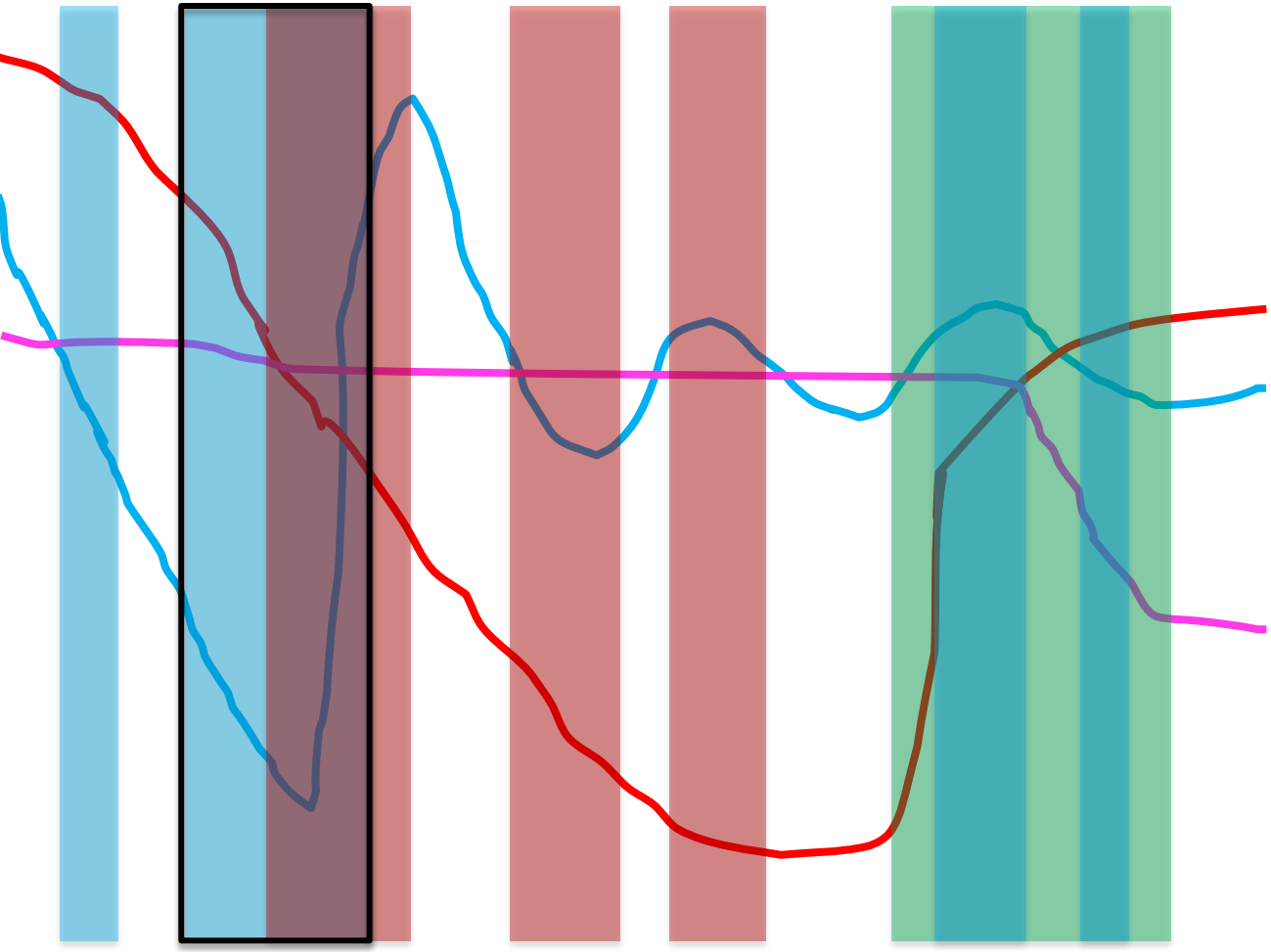






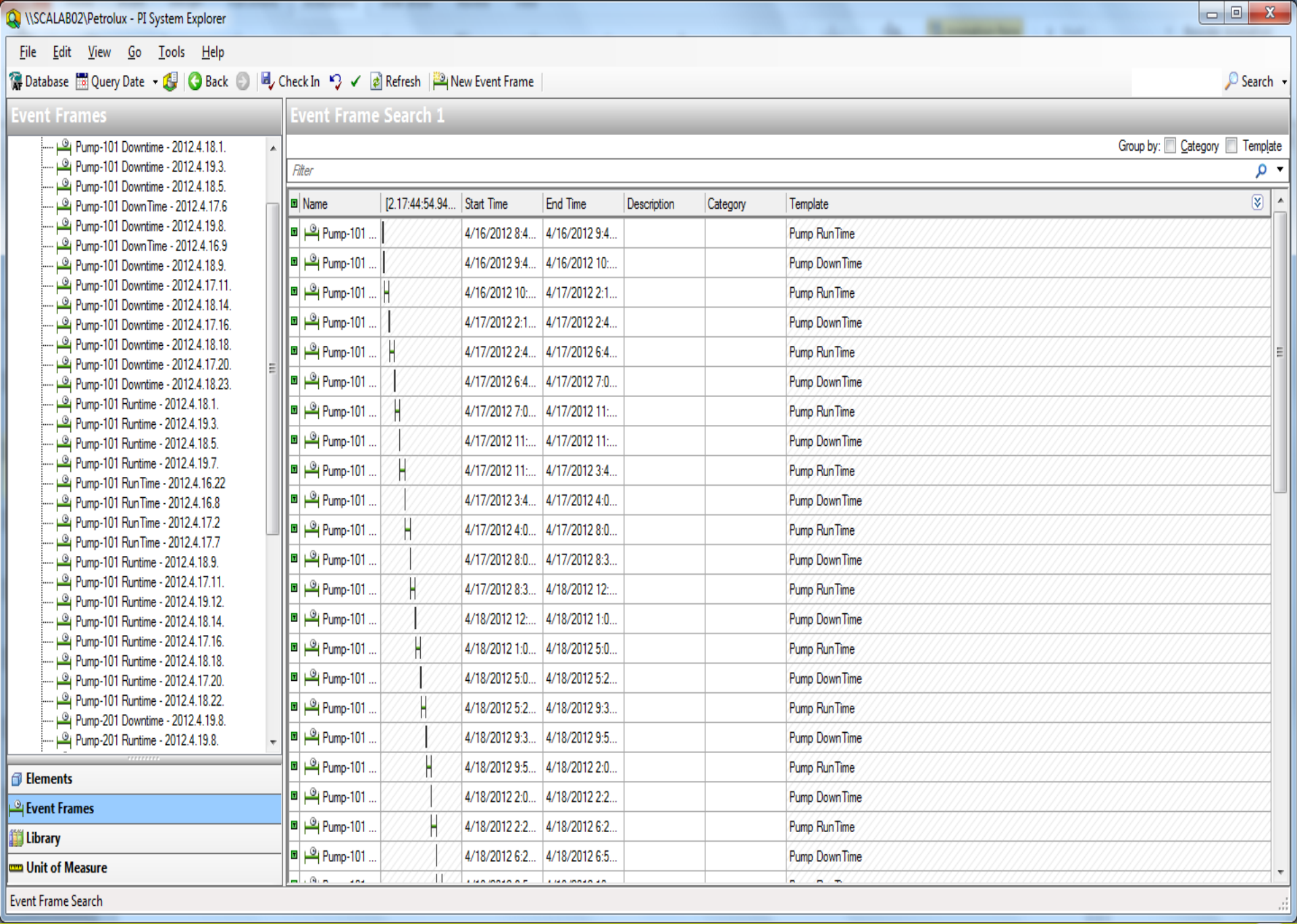


PI Event Frames is a core capability of the PI Server to record important process or business *events* and help you find the *related data*.

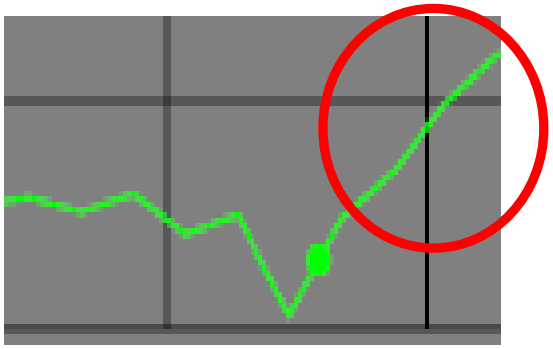


Event Attribute	Value
Name	Ex 20121215-0002
Start	15-Dec-2012 10:35:02
End	15-Dec-2012 10:47:26
Duration	12 min, 24 sec
Asset	Boiler-352
Excursion Type	High Violation
Fuel Gas Flow.Avg	37.12 k sft3/h
Fuel.Start	823.48 k sft3/ton
myPIKPI.Max	47.19 bbl/d

27



PI Notifications



- Define key events
- Customize message conte

- Send to people and systems

- Acknowledge and escalate

- Simplify deployment with templat

Petrolux Pump Report - Report Manager - Windows Internet Explorer

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

Favorites | Suggested Sites | PI Coresight | Coresight Admin | Petrolux Power | Web Slice Gallery

Petrolux Pump Report - Report Manager

Page | Safety | Tools

Home > Petrolux Production Reports > Petrolux Pump Report

Home | My Subscriptions | Site Settings | Help

Refinery: Baton Rouge Refinery Refinery Unit: Alkylation View Report

1 of 1 100% Find | Next

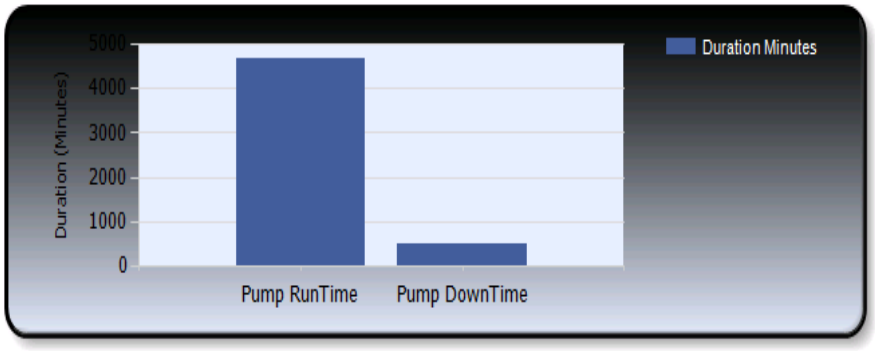
Petrolux Pump Report

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

Report Author: SCALE\ucdemo

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



Total Event Duration by Pump

Done Local intranet | Protected Mode: Off 100%

Petrolux Pump Report - Report Manager - Windows Internet Explorer

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

Favorites | Suggested Sites | PI Coresight | Coresight Admin | Petrolux Power | Petrolux Pump Report - Rep...

Petrolux Pump Report - Report Manager

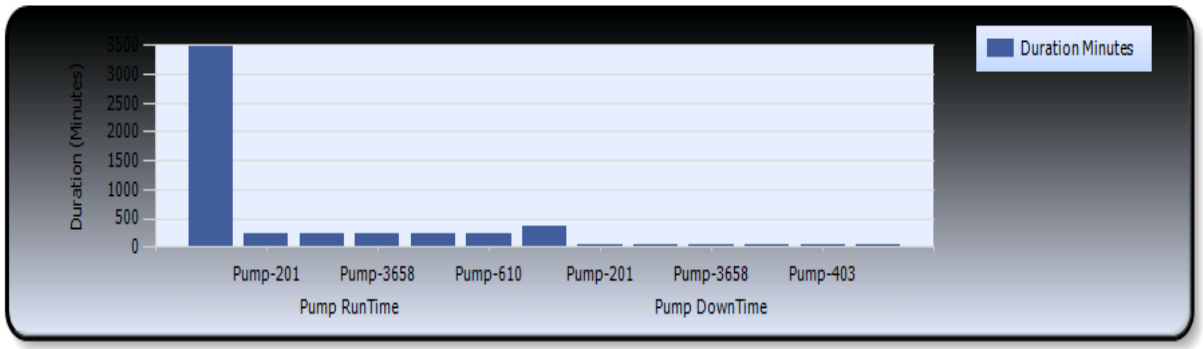
Home > Petrolux Production Reports > Petrolux Pump Report

Home | My Subscriptions | Site Settings | Help

Refinery: Baton Rouge Refinery Refinery Unit: Alkylation View Report

1 of 1 100% Find | Next

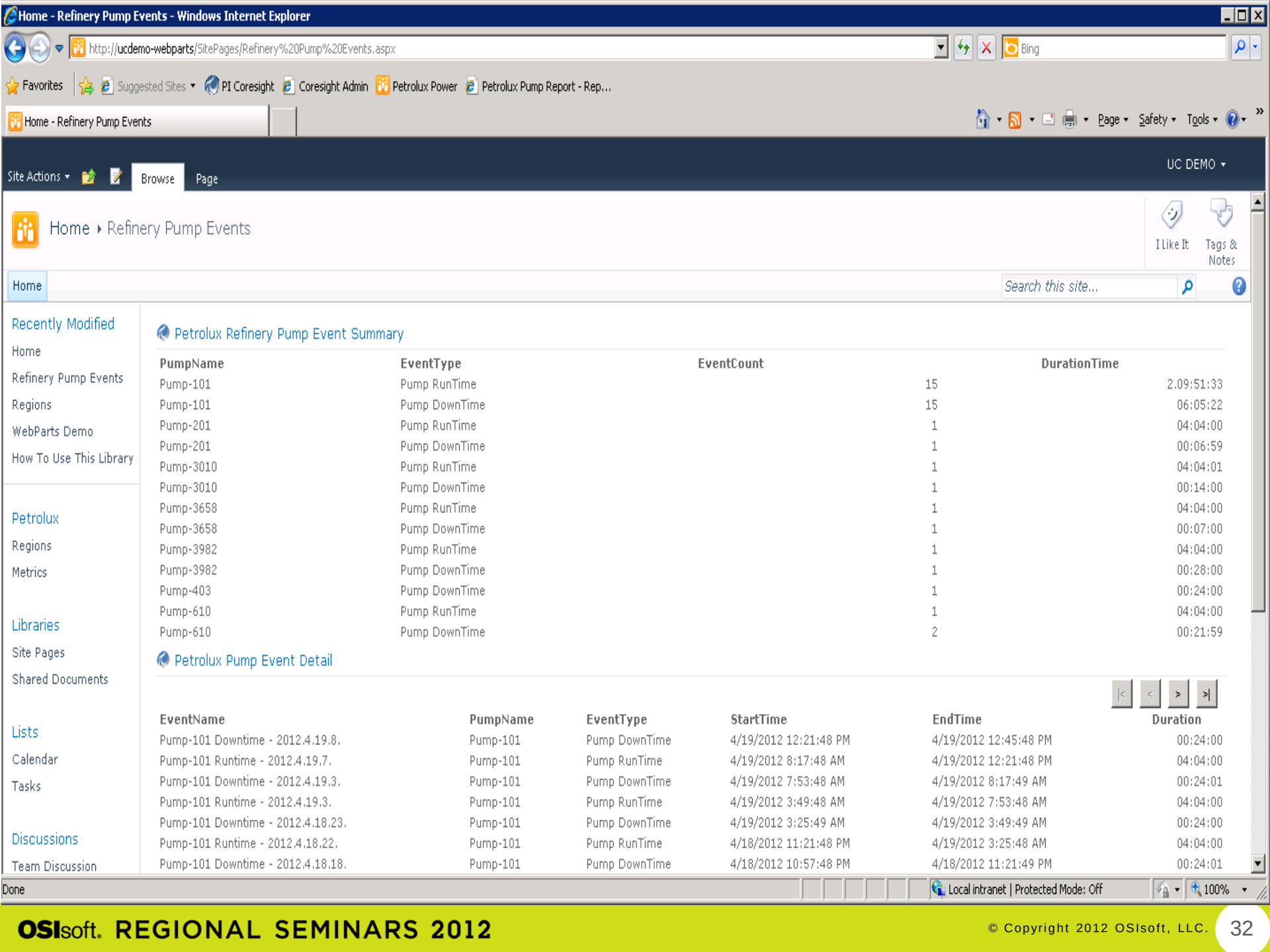
Pump Name	Event Type	Event Count	Duration Time	Duration Minutes	Expected Duration
Pump-101	Pump RunTime	15	2.09:51:33	3472	1051200
Pump-201	Pump RunTime	1	04:04:00	244	1051200
Pump-3010	Pump RunTime	1	04:04:01	244	1051200
Pump-3658	Pump RunTime	1	04:04:00	244	1051200
Pump-3982	Pump RunTime	1	04:04:00	244	1051200
Pump-403	Pump DownTime	1	00:24:00	24	
Pump-610	Pump RunTime	1	04:04:00	244	1051200

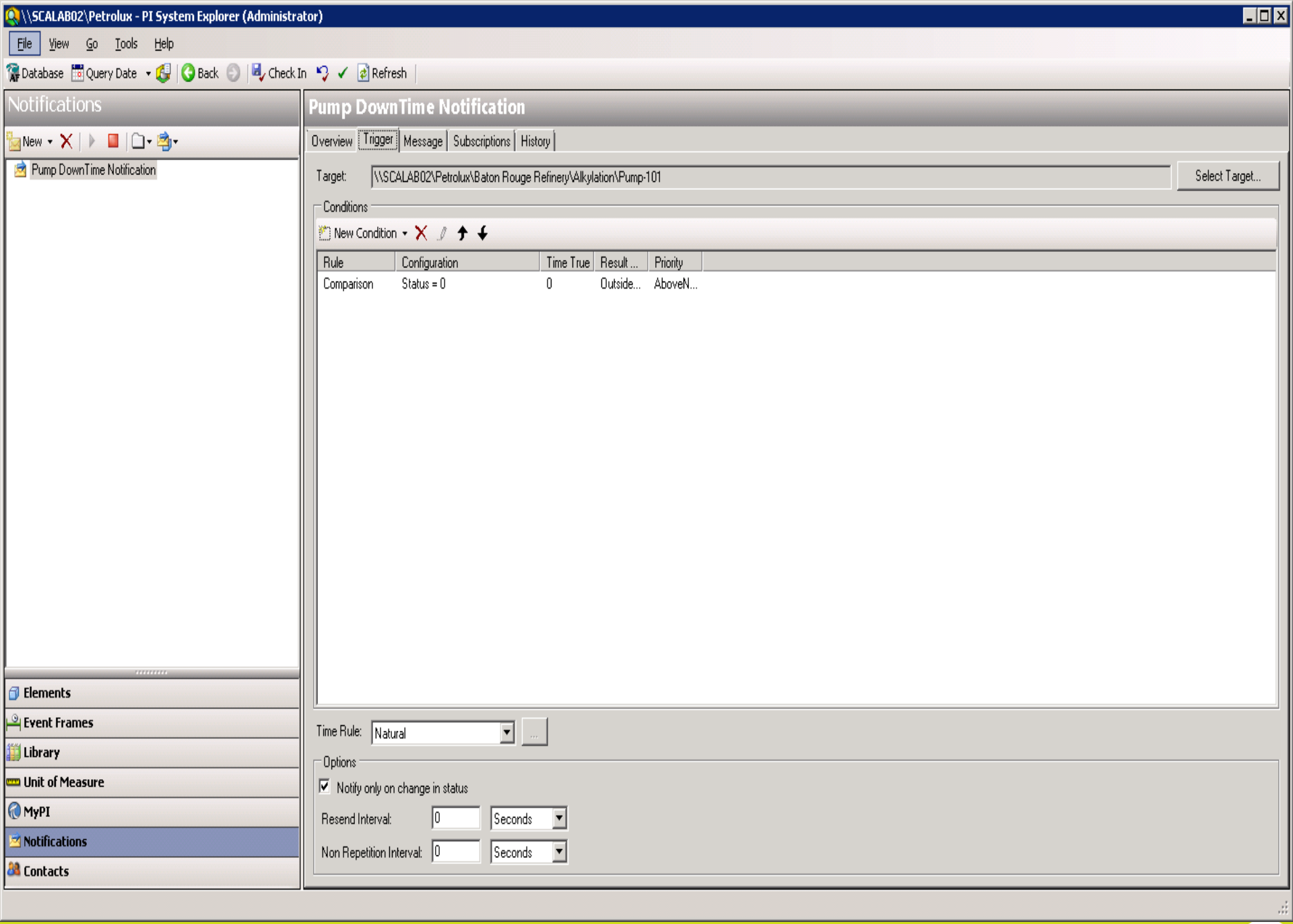


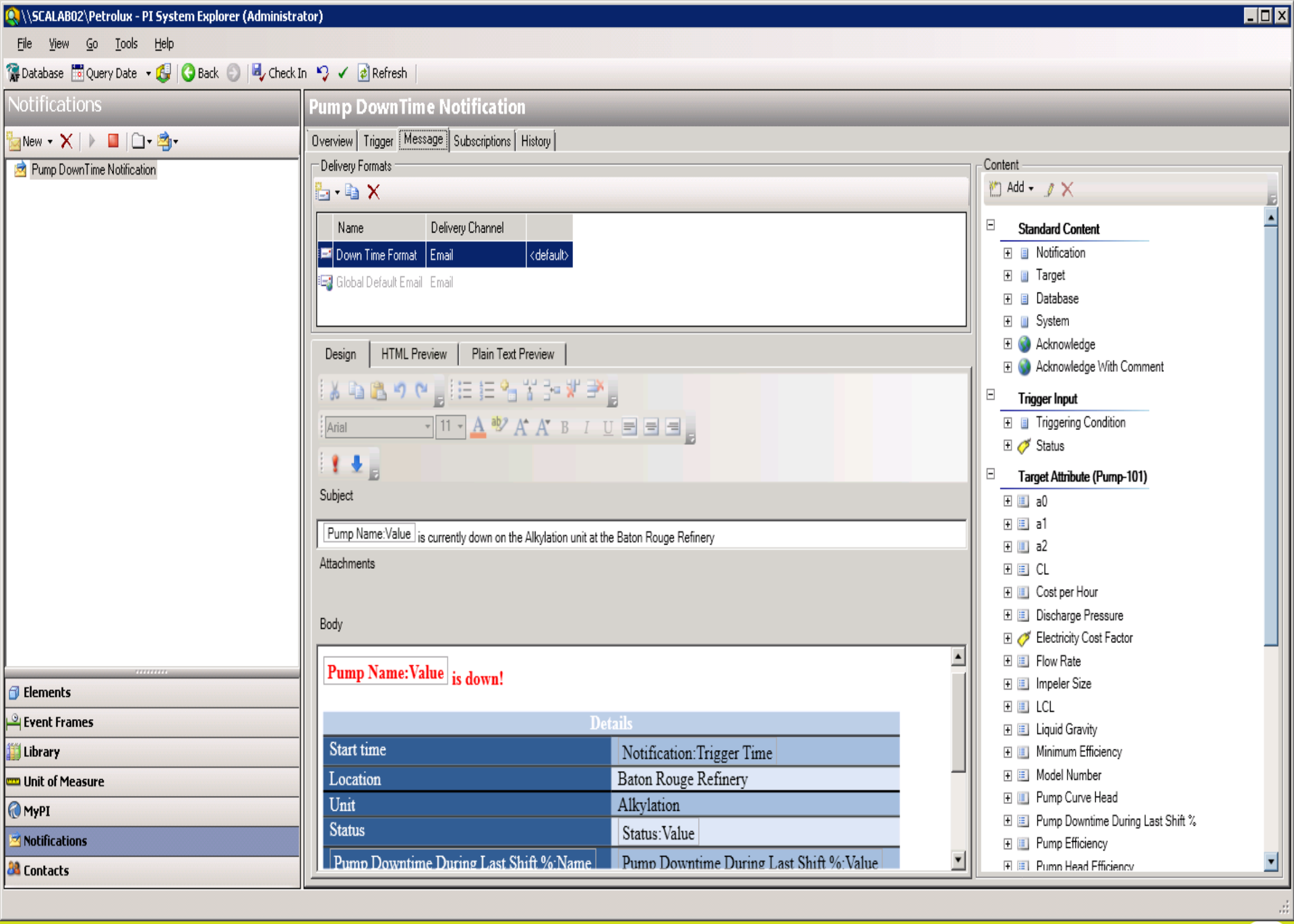
Pump Event Detail

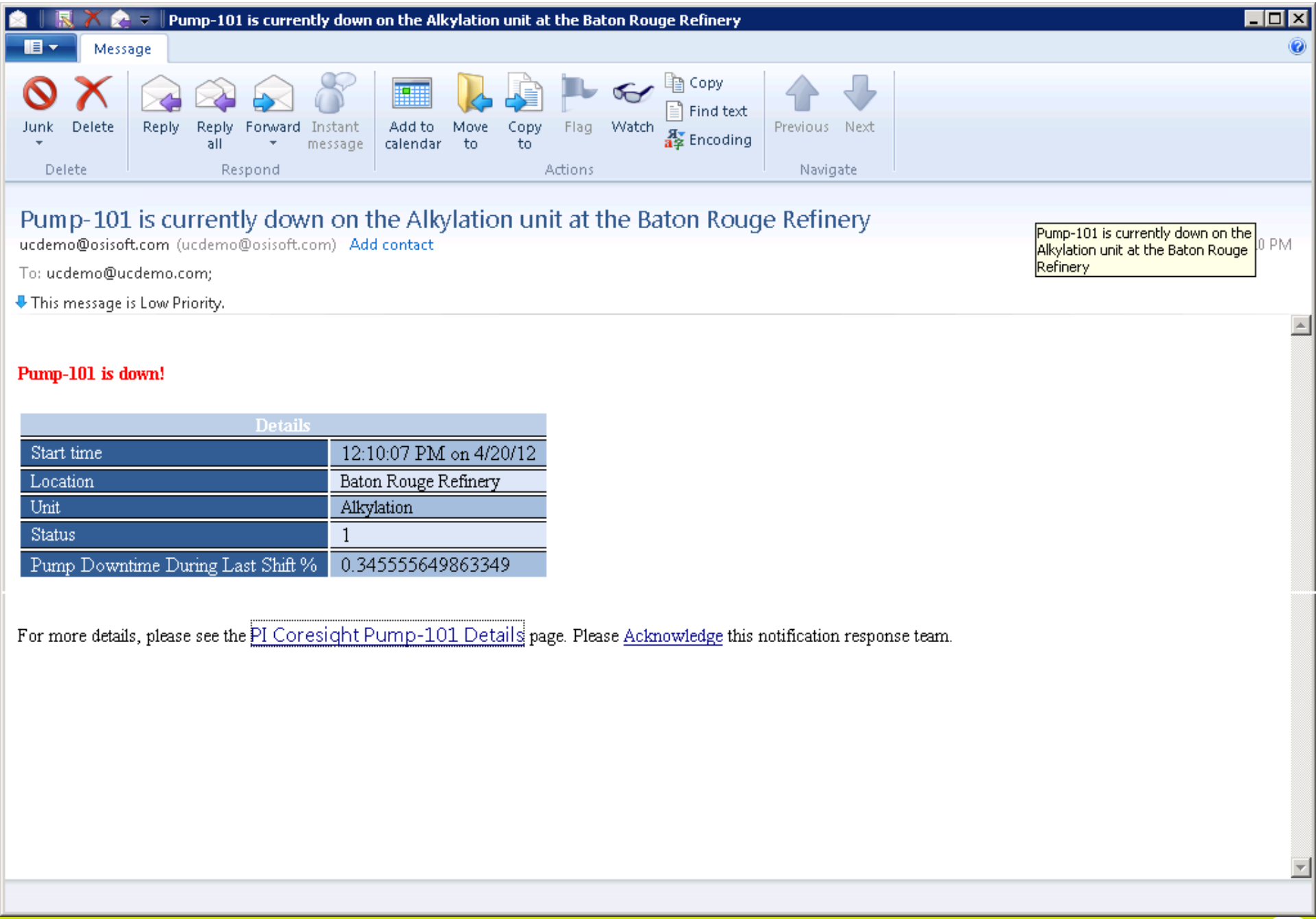
Pump Name	Event Frame Name	Template Name	Start Time	End Time	Duration

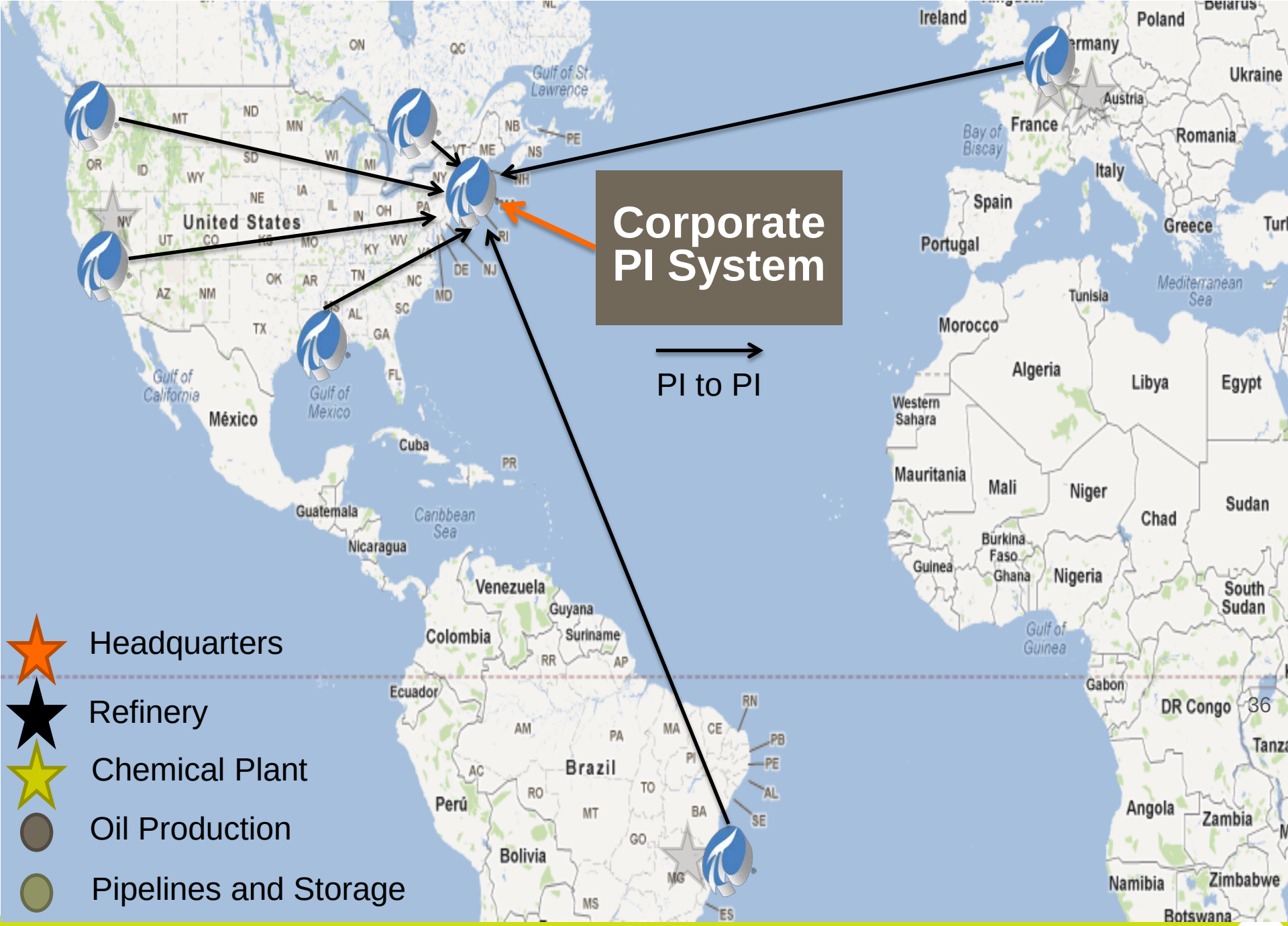
Done Local intranet | Protected Mode: Off 100%

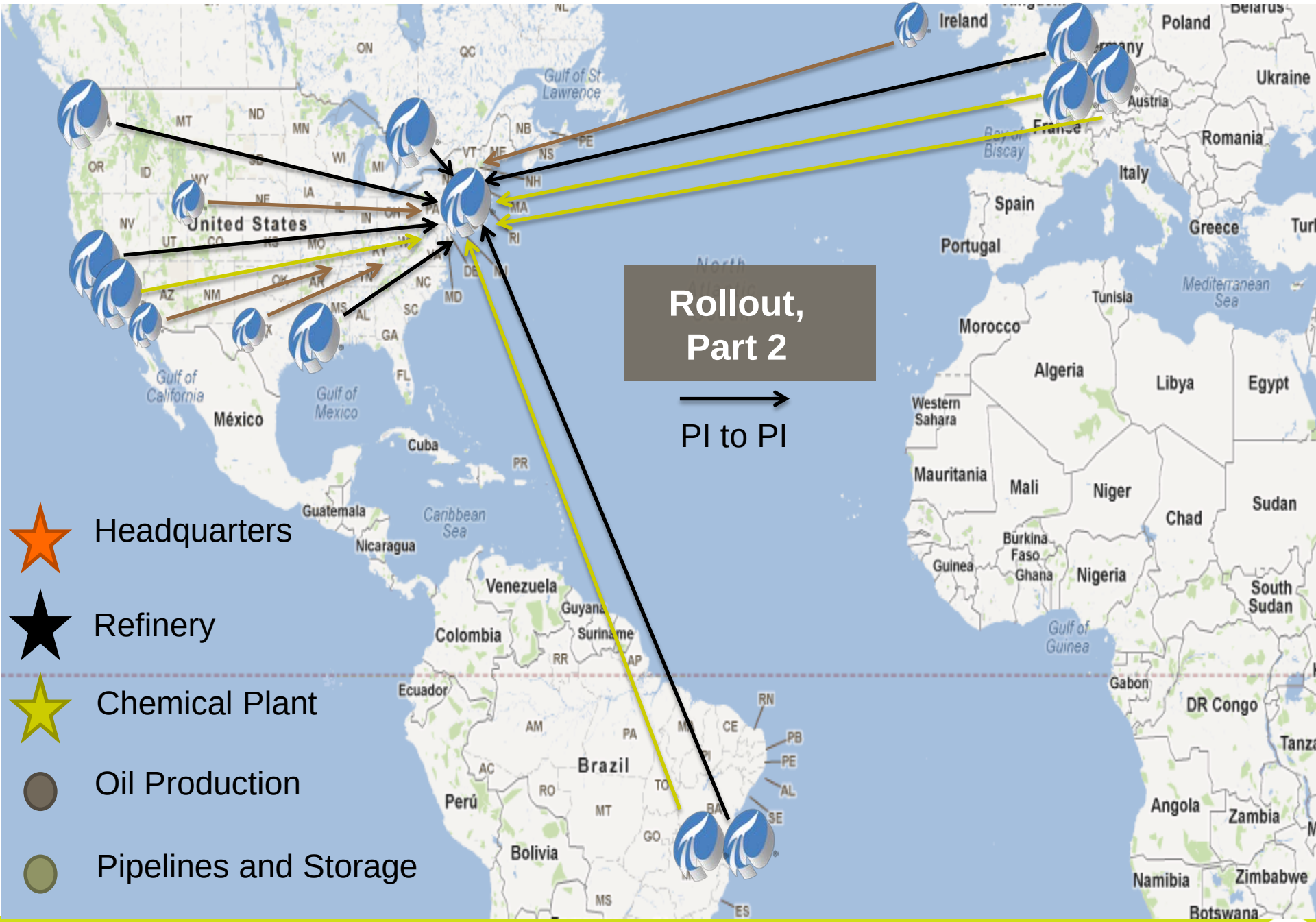












2010 R3

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

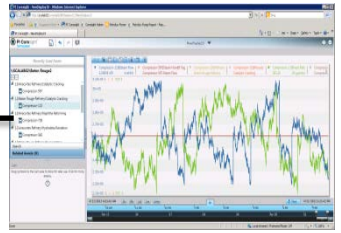
2012

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

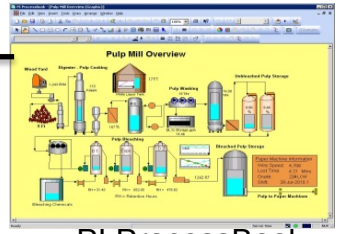
PI Server 2012 is More Resilient

PI Interface

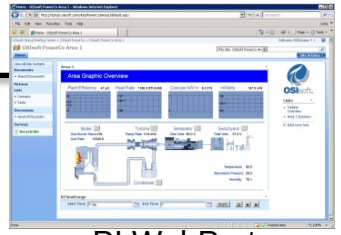
PI Server



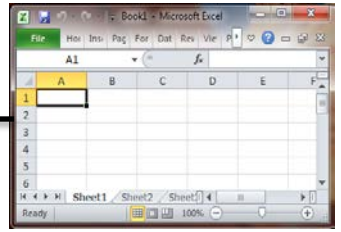
PI Coresight



PI ProcessBook

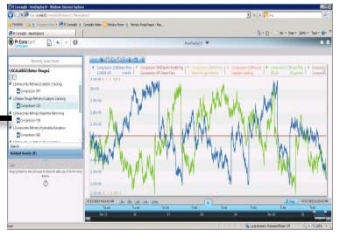


PI WebParts



PI DataLink

Resilient During: Restarting from Hard Power Stop



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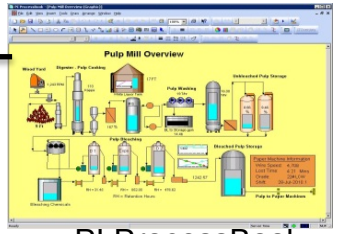

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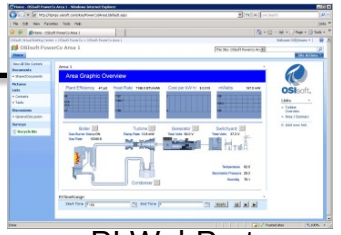

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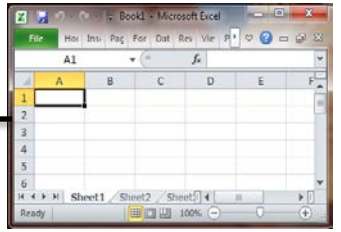


PI DataLink

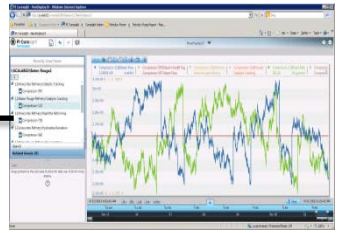
PI Interface

PI Server

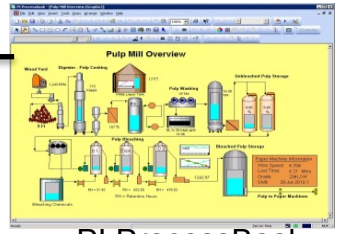
Resilient During: Heavy Backfilling

PI Interface

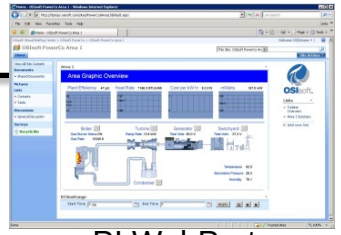
PI Server



PI Coresight



PI ProcessBook



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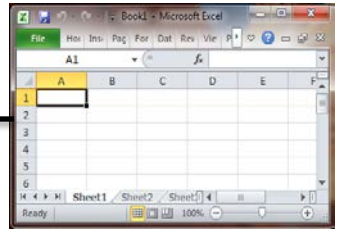
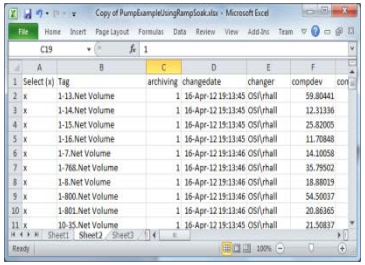
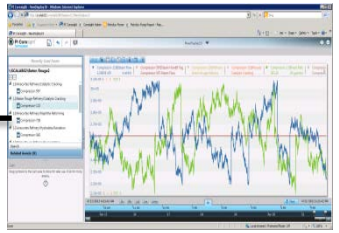


PI DataLink

Resilient During: Large Point Building Operations





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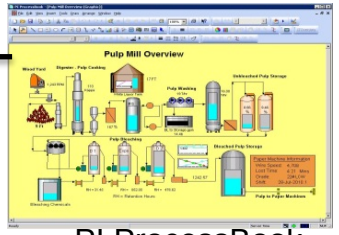
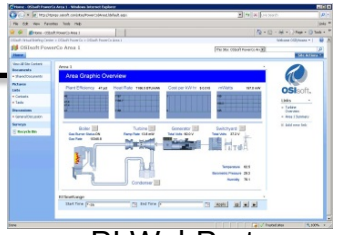


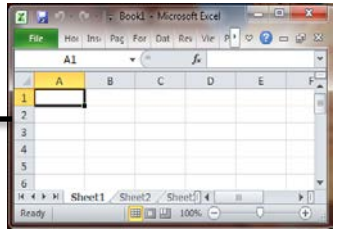
PI ProcessBook

PI Interface

PI Server

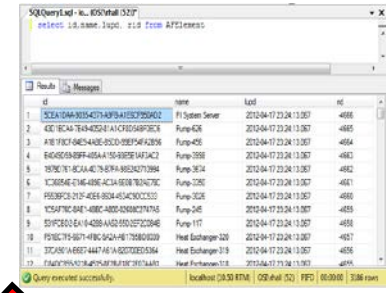


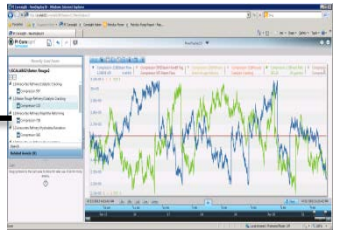
PI WebParts



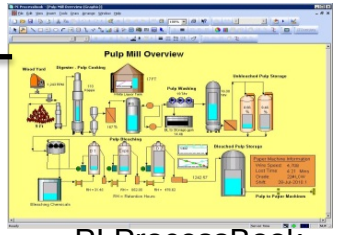
PI DataLink

Resilient During: Large PI OLEDB Queries





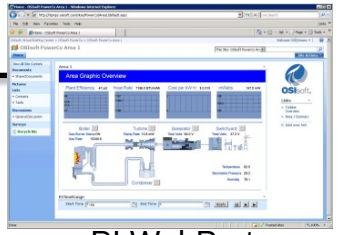
PI Coresight



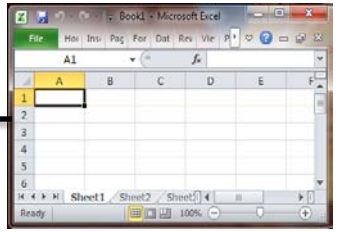
PI ProcessBook

PI Interface

PI Server



PI WebParts

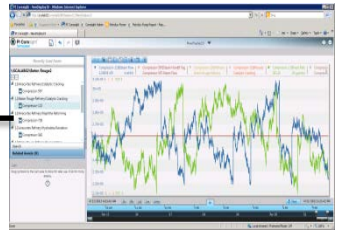


PI DataLink

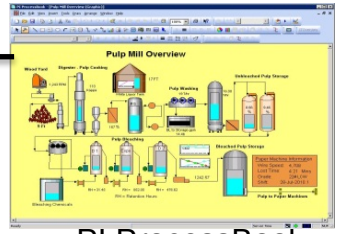
Resilient During: Network Disruption, Reconnection

PI Interface

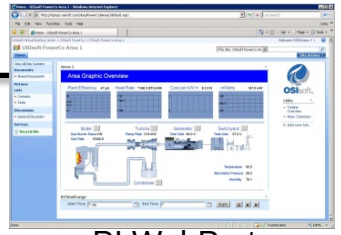
PI Server



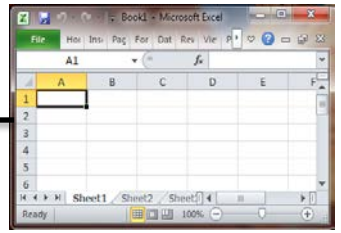
PI Coresight



PI ProcessBook

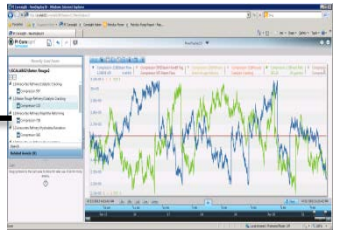


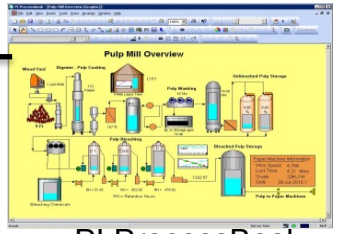
PI WebParts



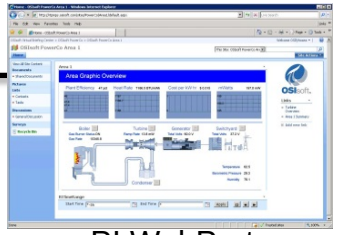
PI DataLink

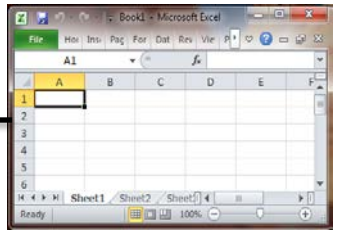
Resilient During: Backup Operations


PI Coresight



PI ProcessBook

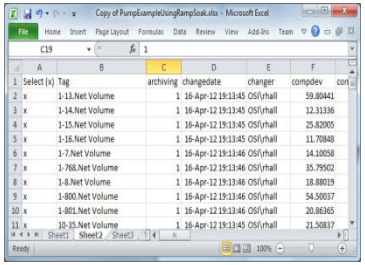

PI WebParts

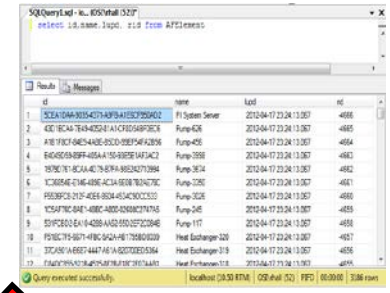

PI DataLink

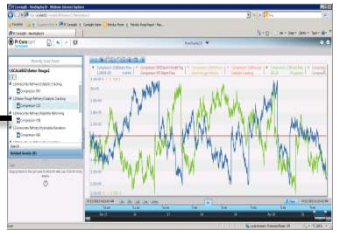

PI Interface


PI Server

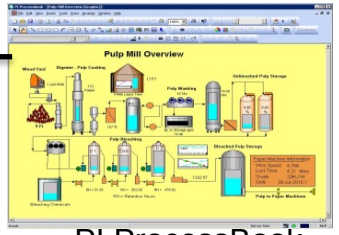
Resilient During: Several Events at the Same Time







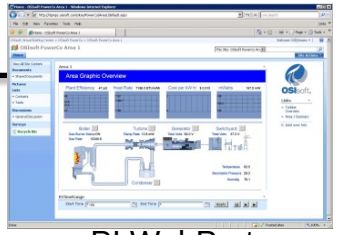
PI Coresight



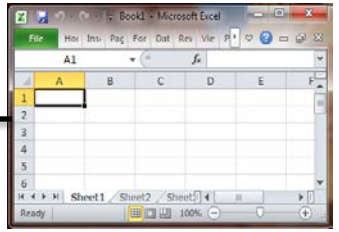
PI ProcessBook

PI Interface

PI Server

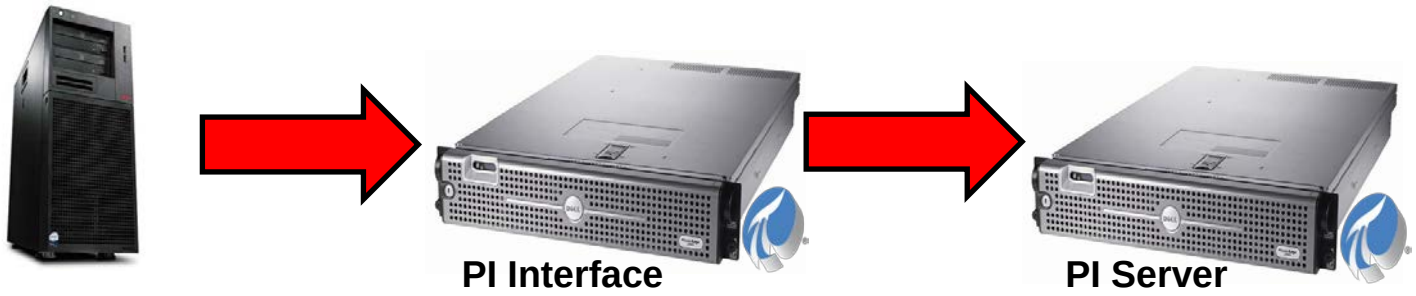


PI WebParts

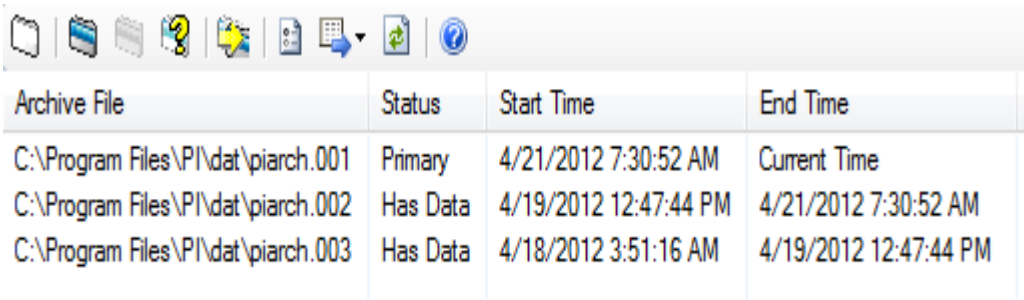


PI DataLink

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	Minutes
3	Check Disk Space	Minutes
4	Reprocess Archives	Days/Weeks
5	Create Archives	Minutes
6	Backfill Data	Hours/Days

2012

1	Create PI Points	5x Faster
2	~~Delete Pt. Created~~	Zero
3	Check Disk Space	Minutes
4	~~Reprocess Archives~~	Zero
5	Create Archives	Minutes
6	Backfill Data	5x Faster

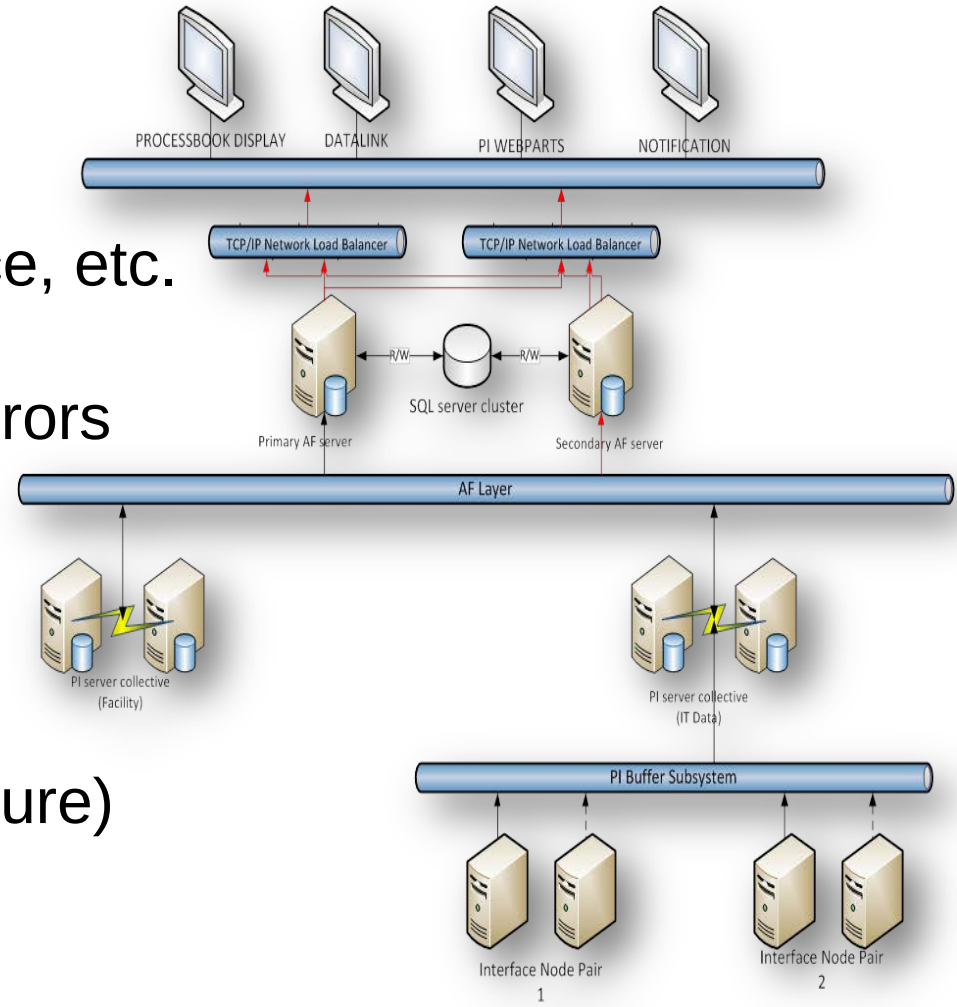
Petrolux Value from PI Server 2012

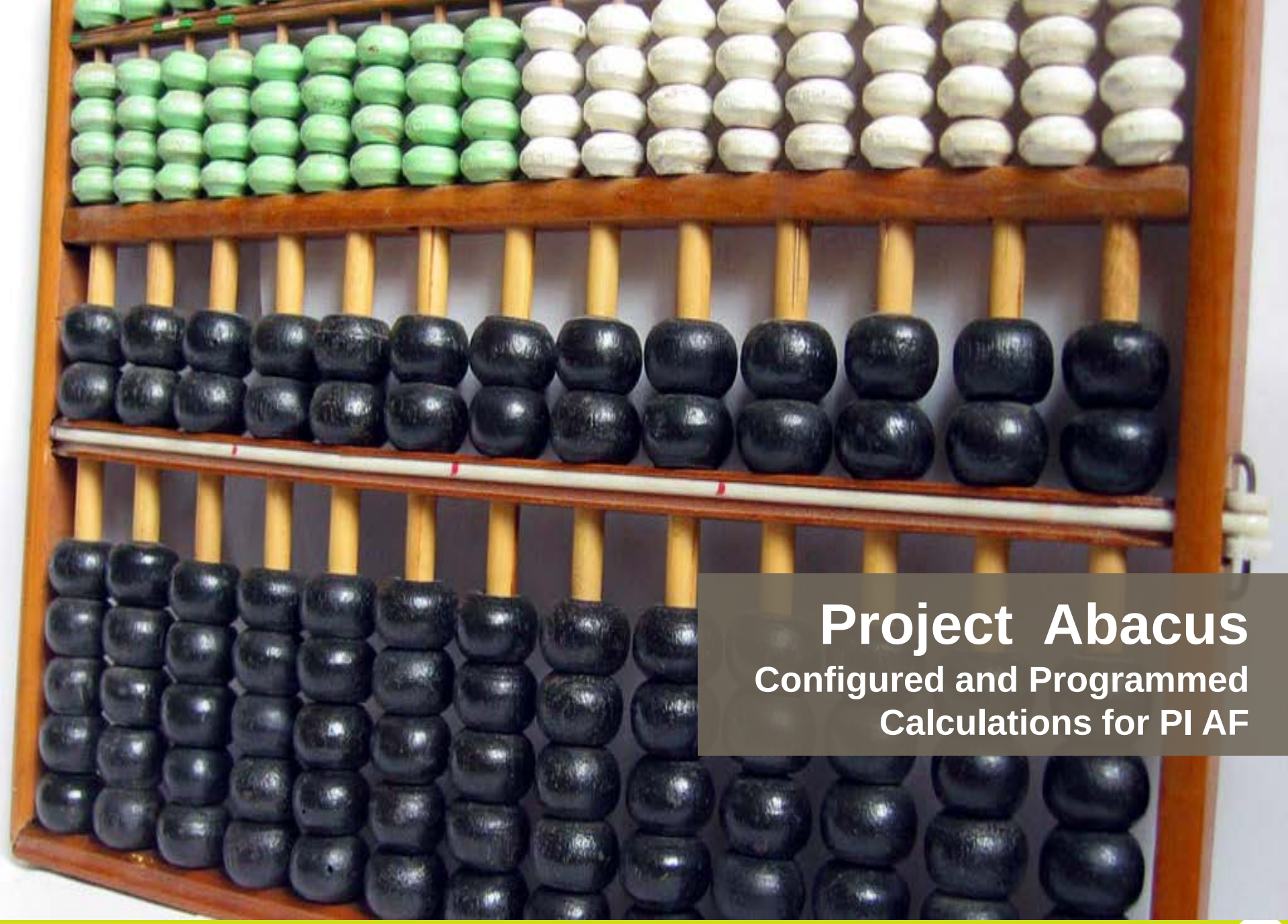
- **Simplified** Installation, Automatic Backfilling
- Very high **Scale** for growth
- **Faster** queries and response
- More **Resilient** during atypical scenarios

OSIsoft NOC

OSIsoft IT Systems

- ☑ 20 OSIsoft Office Locations
- ☑ Servers
  - CPU, Memory, Disk Space, etc.
- ☑ Network
  - Ping Time, Bandwidth, Errors
- ☑ Facilities
  - Building Power Usage
  - Rack Load
  - UPC Battery Status
  - Cooling (HVAC, temperature)
- ☑ More…





Project Abacus

Configured and Programmed Calculations for PI AF

Project Abacus Use Case

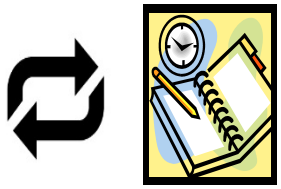
Extruding Process

Boiler Efficiency = AVG(B1..Bn)

Boiler1

Flow Out

Fuel Flow Rate



Boiler Template

Efficiency = (Flow Out / Fuel Flow Rate * 3.14)

Or myProgrammedCalc (Flow Out, Fuel Flow Rate)

Boiler2

Flow Out

Fuel Flow Rate

Efficiency

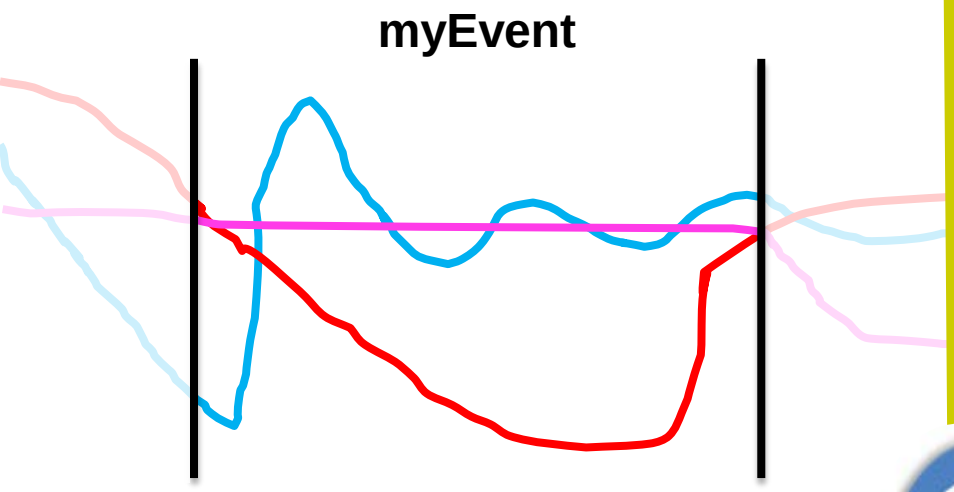
Boiler3

Flow Out

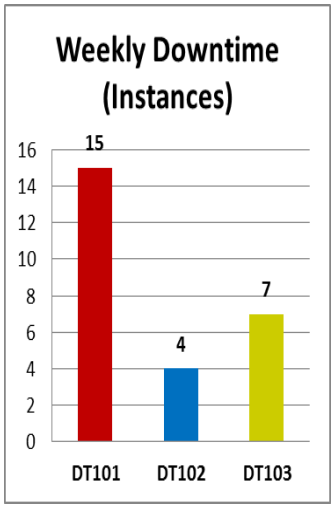
Fuel Flow Rate

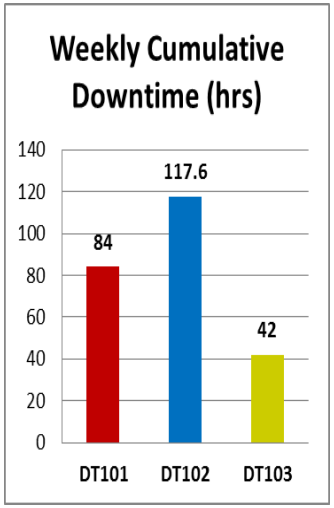
Efficiency

Simplify Data Analysis

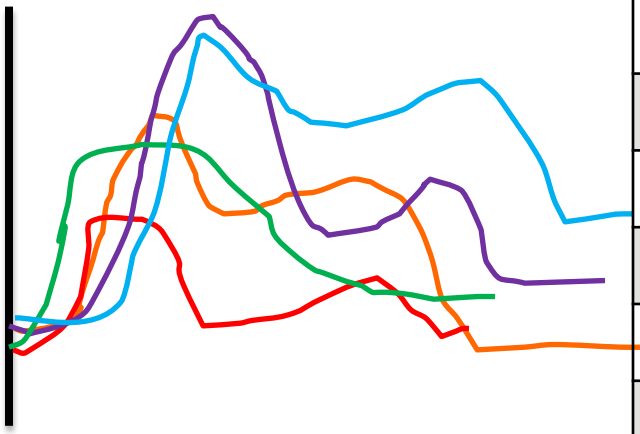


Perform Asset Comparisons



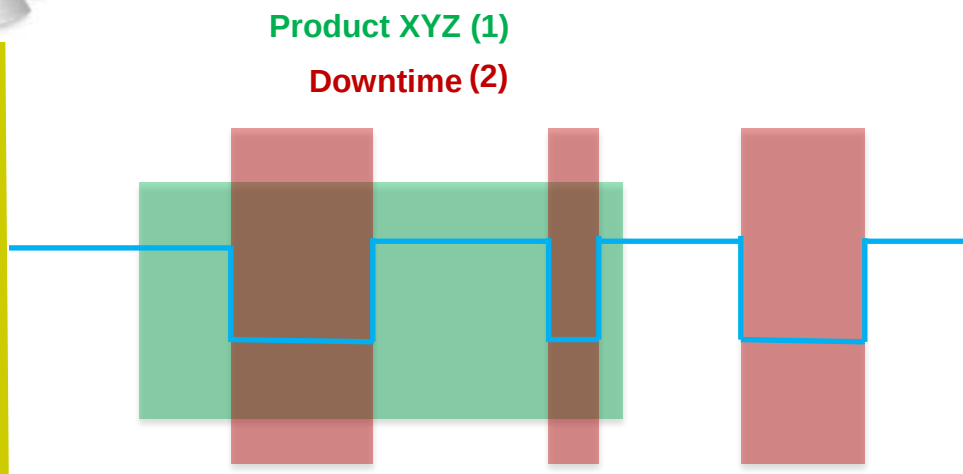


Event Overlay Trend (Temp)



Name	Temp.Max
EF1	122.47
EF2	109.34
EF3	112.73
EF4	98.61
EF5	125.24

Downtime Events for Product XYZ

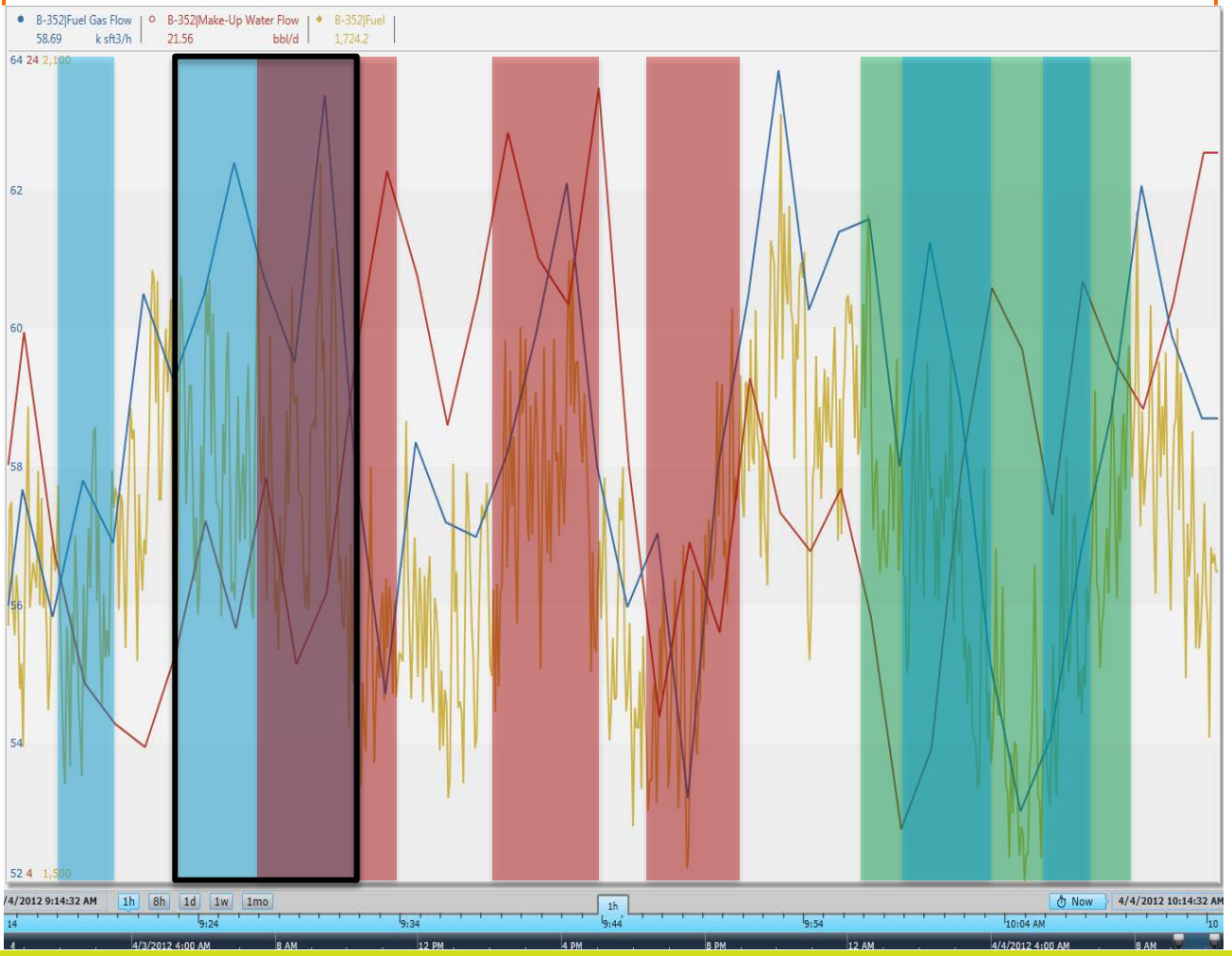


Perform Event Comparisons

Discover Event Interrelationships

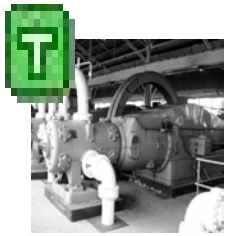
PI Event Frames is a core capability of the PI Server to record important process or business *events* and help you find the *related data*.

Excursions (4) Downtime (3) Product XYZ (1)



Event Attribute	Value
Name	Ex 20121215-0002
Start	15-Dec-2012 10:35:02
End	15-Dec-2012 10:47:26
Duration	12 min, 24 sec
Asset	Boiler-459
Excursion Type	High Violation
Fuel Gas Flow.Avg	37.12 k sft3/h
Fuel.Start	823.48 k sft3/ton
myPIKPI.Max	47.19 bbl/d

Event Generation in Abacus



|Efficiency

|Fuel Flow Rate

|Flow Out

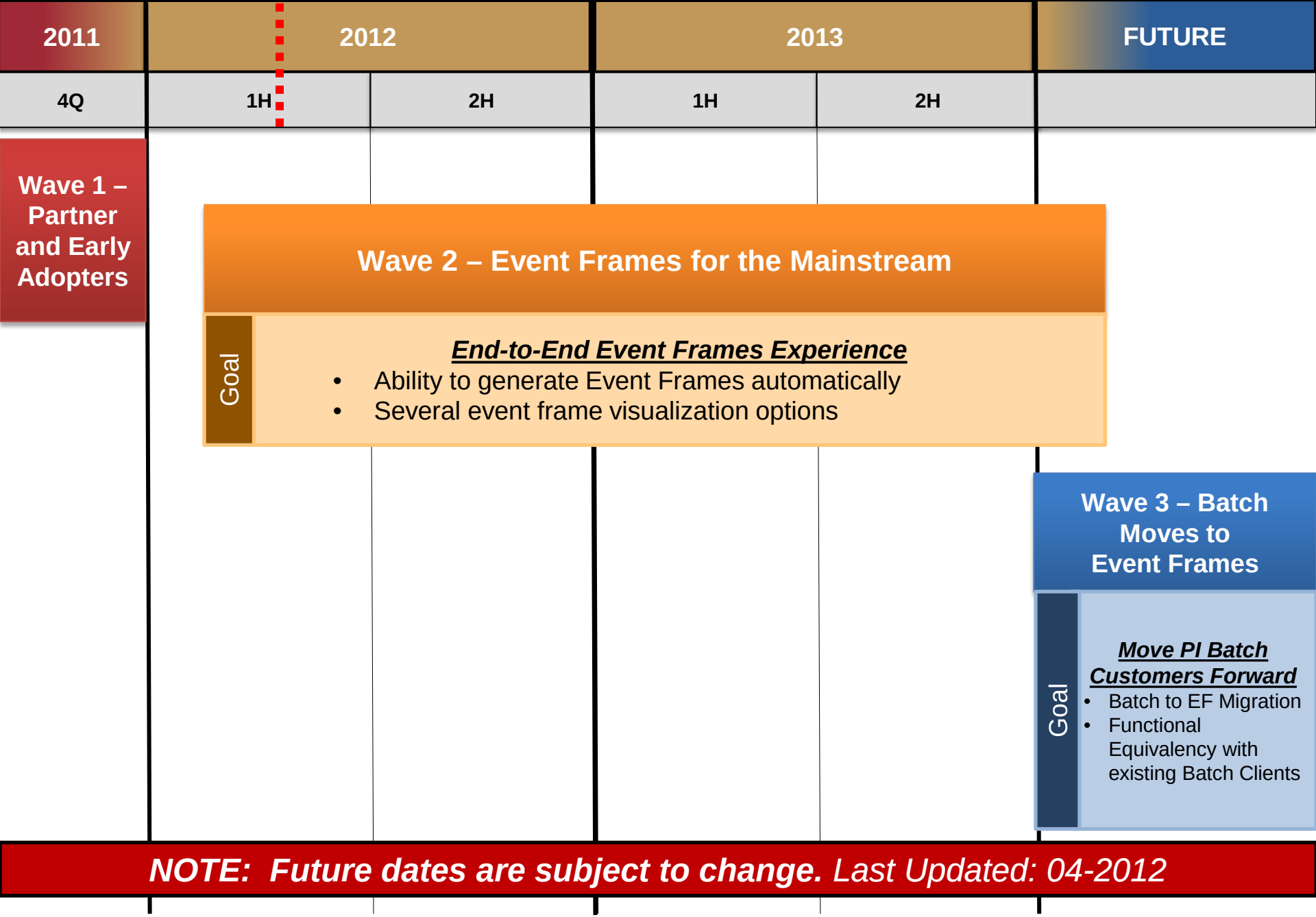
"Abacus"

myEF

|Efficiency

Efficiency = (**Flow Out** / **Fuel Flow Rate** * 3.14)

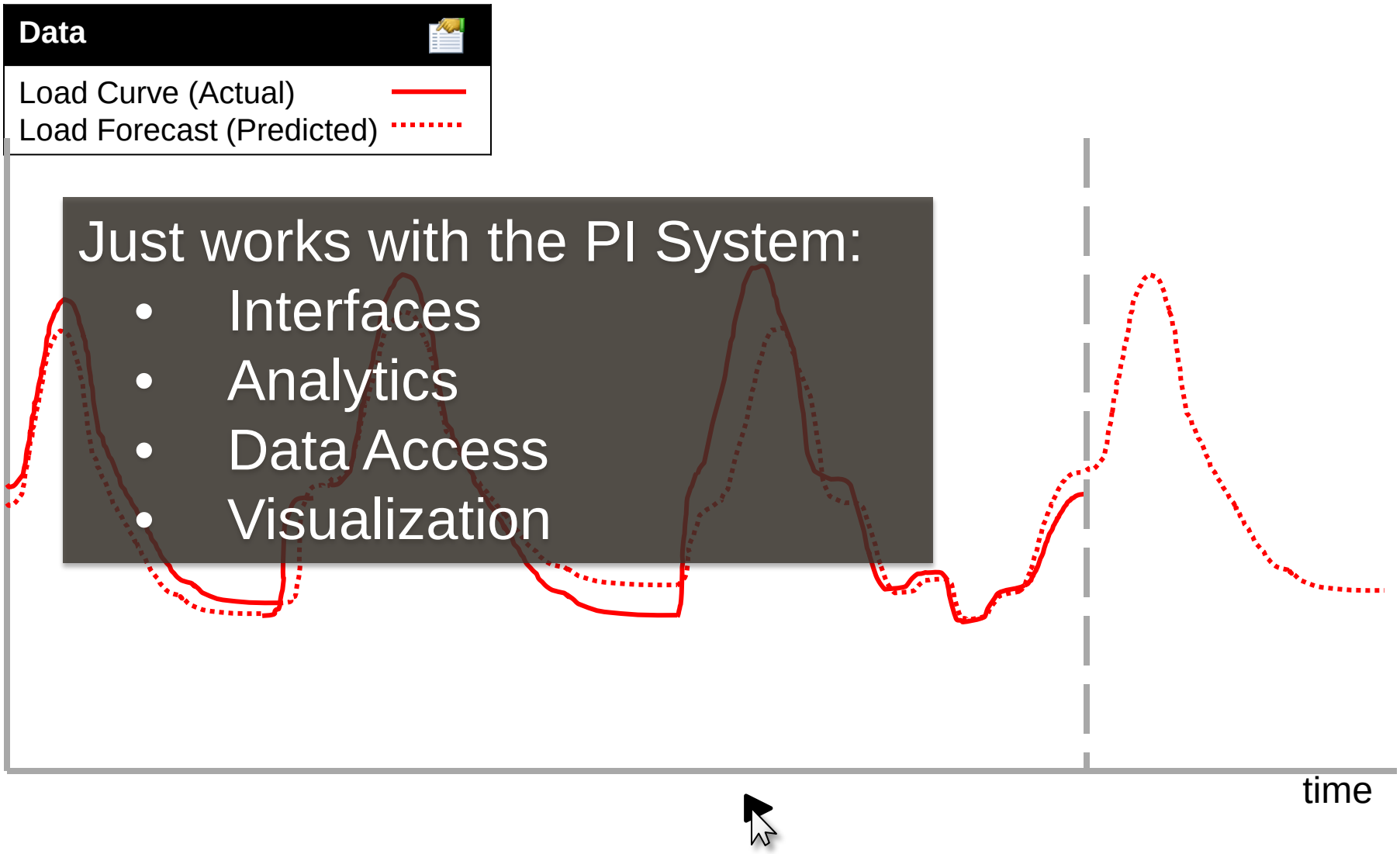
myEF.Start = (**Efficiency** > LIMIT)
myEF.End = (**Efficiency** < LIMIT) AND (**Fuel Flow Rate** > 80)



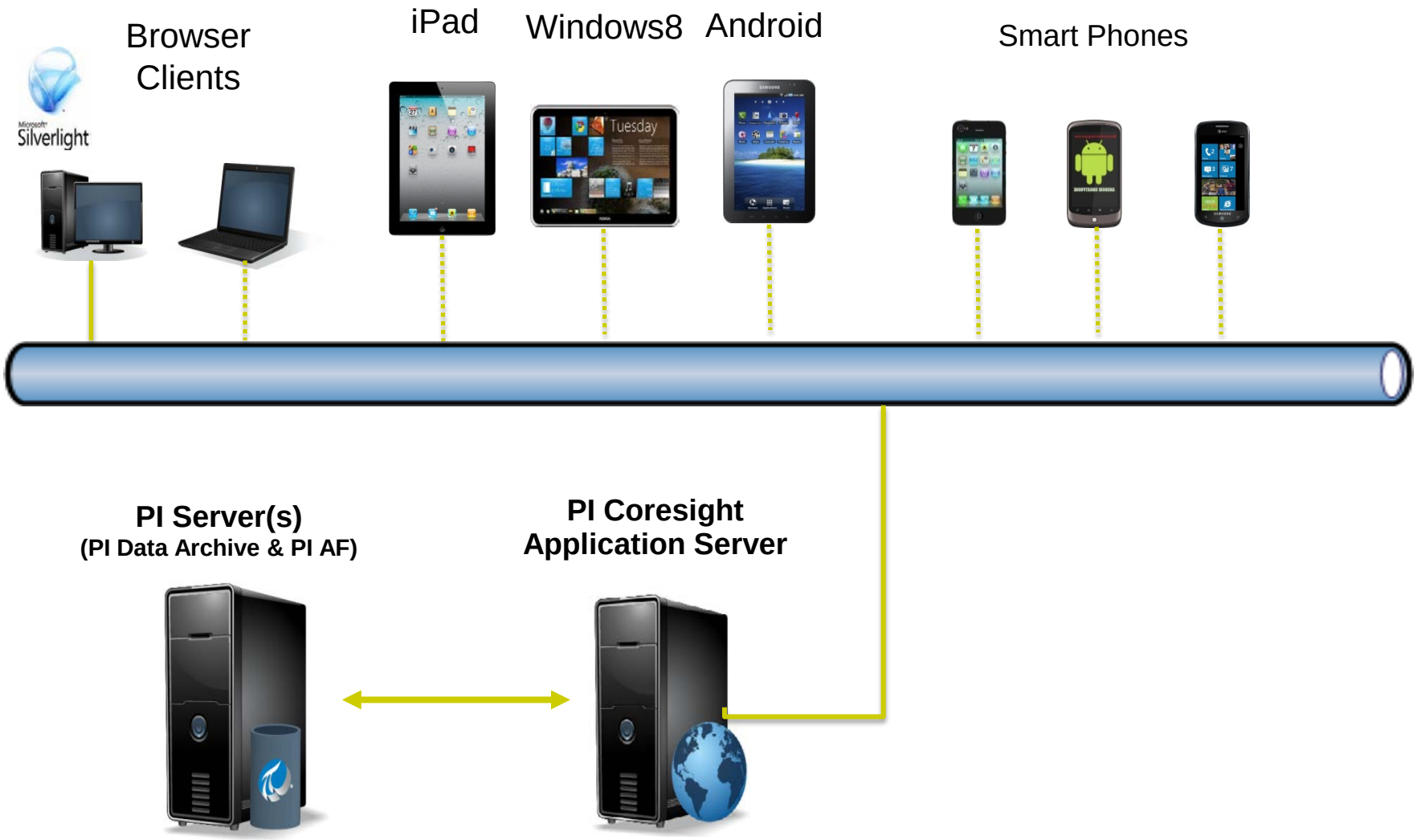
Find - PI System Search

- Optimized Search Engine for the whole PI System
  - And perhaps related systems
- Indexed for high performance
- Weighted / Ranked Results
  - Helps you find things more easily
- Can crawl many PI System machines
- Includes client artifacts
  - PI ProcessBook Displays, PI Coresight Displays
- Common User Experience

Future Data Coming – Next PI Server



PI Coresight with Mobile Clients



PI WebParts 2012

- Support for SharePoint 2010 and SharePoint “15”
- Become a better SharePoint corporate citizen
- Become a more “IT” friendly product
- Replace obsolete technology
- Set the stage for OS and Browser independence, Mobile

- Remote Data Services
- WSP Installs
- Can leverage Adobe SVG Viewer if needed
- Support for IE 8

- Remote Data Services
- WSP Installs
- Visualization using Web Standards
- Support for IE9, IE10, Firefox, and Chrome

What's the difference?

- **Coresight**
  1. Lightweight
  2. No Sharepoint required
  3. Only PI data
  4. Limited sharing & collaboration capabilities

- **Webparts**
  1. Requires Sharepoint
  2. Variety of sharing features
  3. Display data from different sources
  4. Display data in different formats

PI Cloud Initiatives

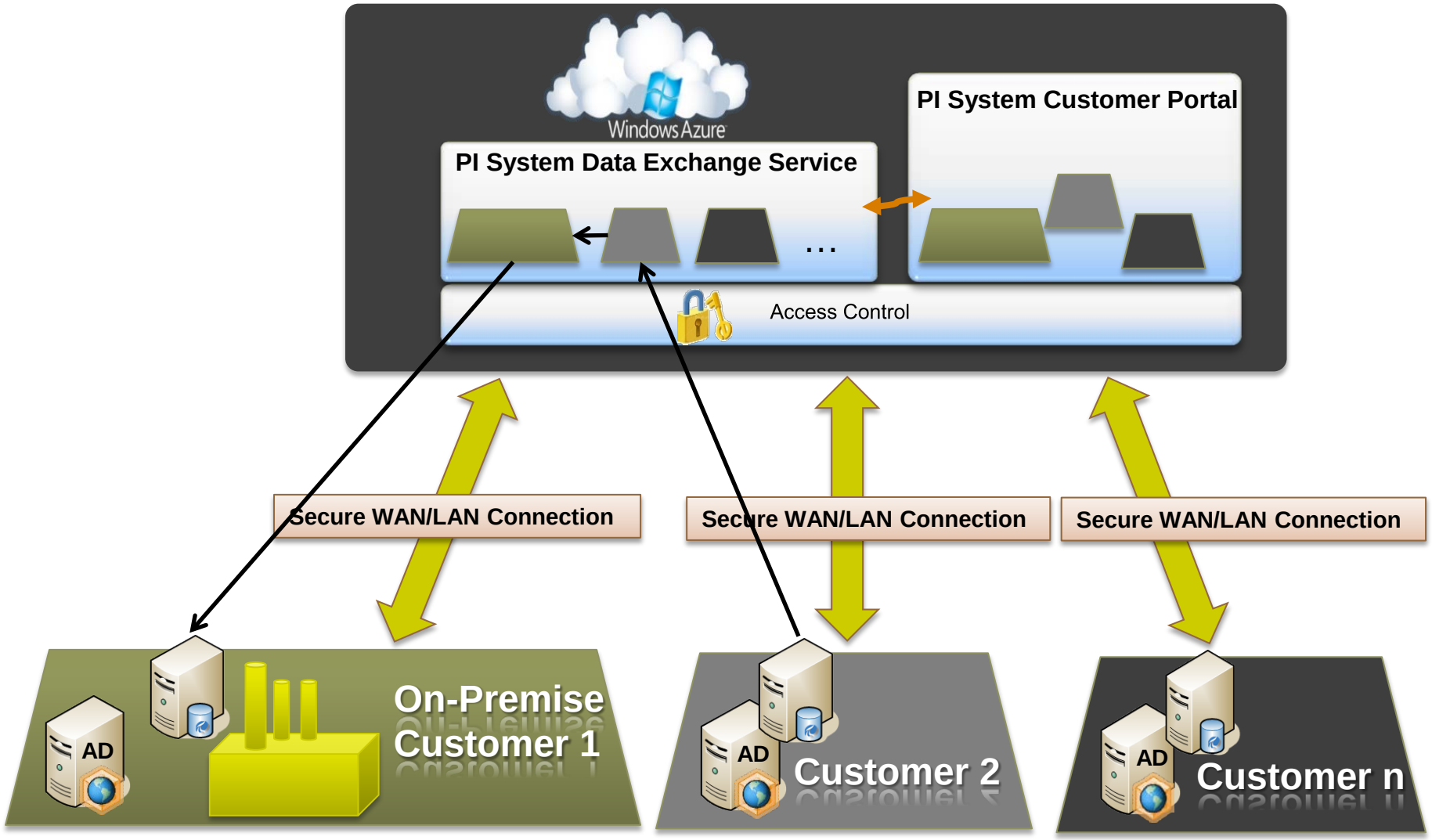
Add to existing PI System installations

- PI System Management
- PI Data Exchange
- PI Coresight Service
- Data, Visualization and other services for Partner and Custom Apps

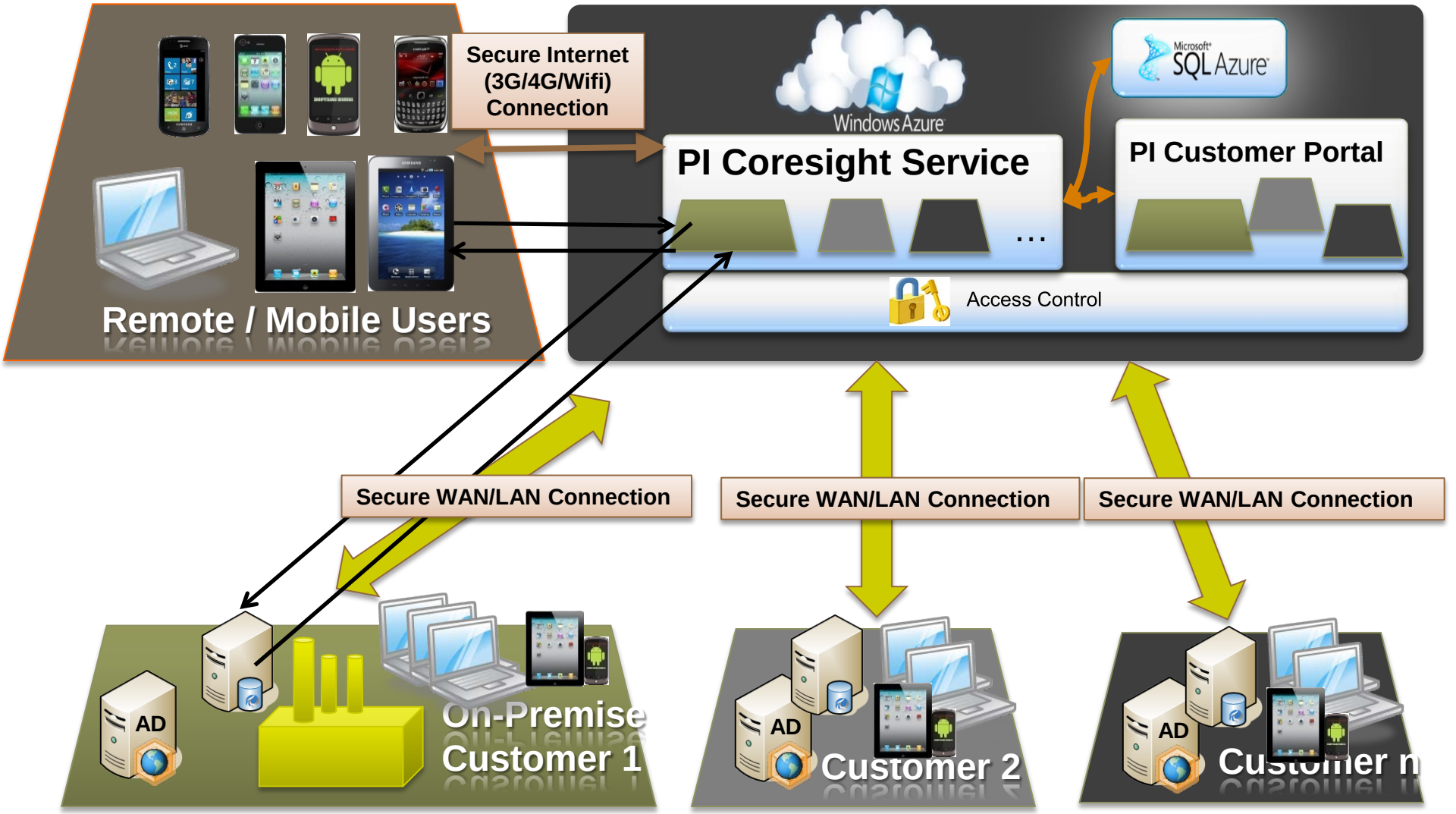
Full PI System Deployment in the Cloud

- Simplified Deployment and Management
- Take advantage of the Windows Azure Platform (PaaS)
- Functionality you know in the PI System today plus much more
- Highly efficient and elastic

PI Data Exchange Service



PI Coresight Service with Mobility

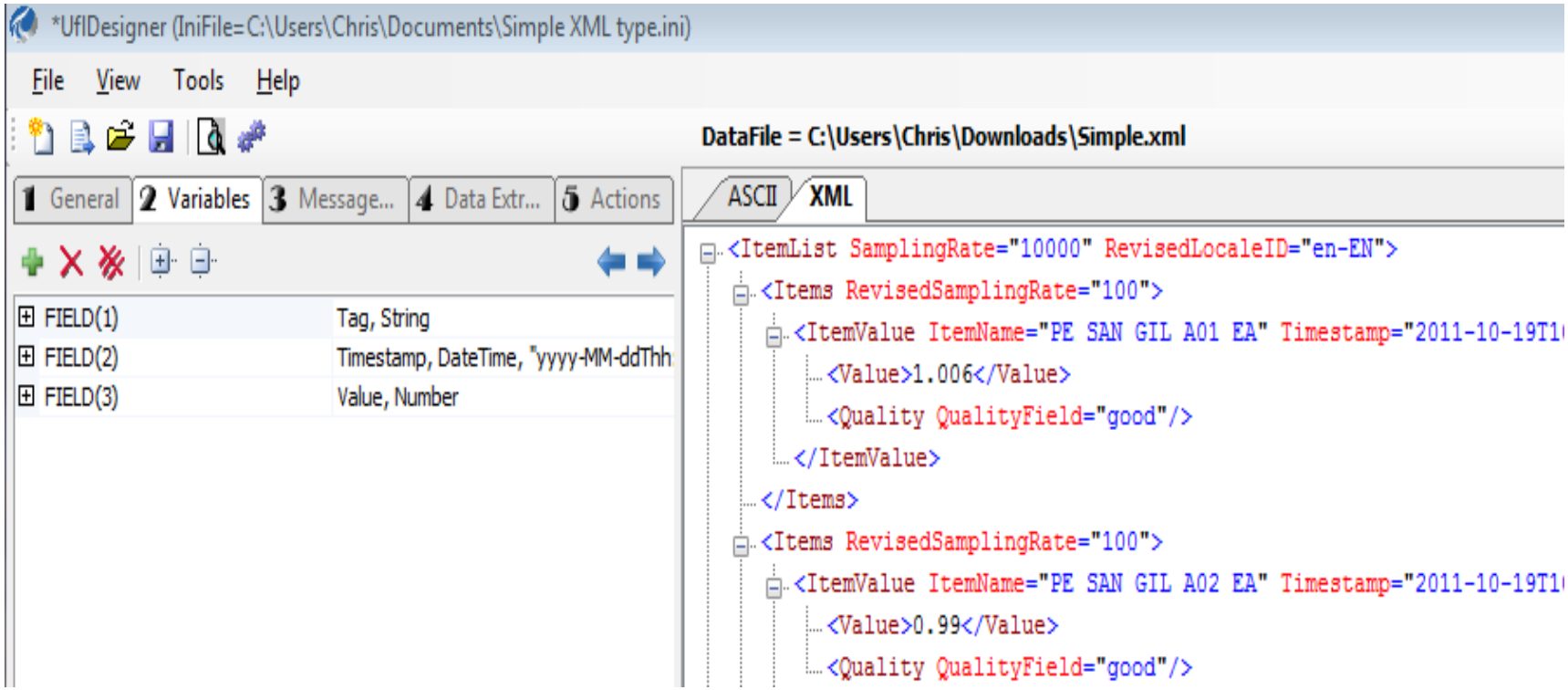


PI Interfaces

Collect and store the data from all your sensors and systems

UFL Designer: better for XML files

- Coming soon



PI Interfaces and PI Server 2012

- Easier backfilling for any PI Interface
- PI Interface for IEEE C37.118
  - High-speed phasor data
- PI Interfaces for AMI
  - Collect data from many meters
- PI Interfaces for batch and manufacturing execution systems
  - Population of Assets and Event Frames

New PI Interfaces on the Horizon

- Continuous improvements to many
- PI Interface for OPC UA
- PI Interface for Emerson DeltaV (OPC .Net)
- PI Interface for Bachmann Controller
- PI Interface for IEC 61850 (substations, wind, …)
- PI Interface for OpenPDC
- PI Interface for OnRamp CIMA (wireless T&D)
- PI Interface for Aker Decoder (oil and gas: drilling)

Our Demonstrations

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

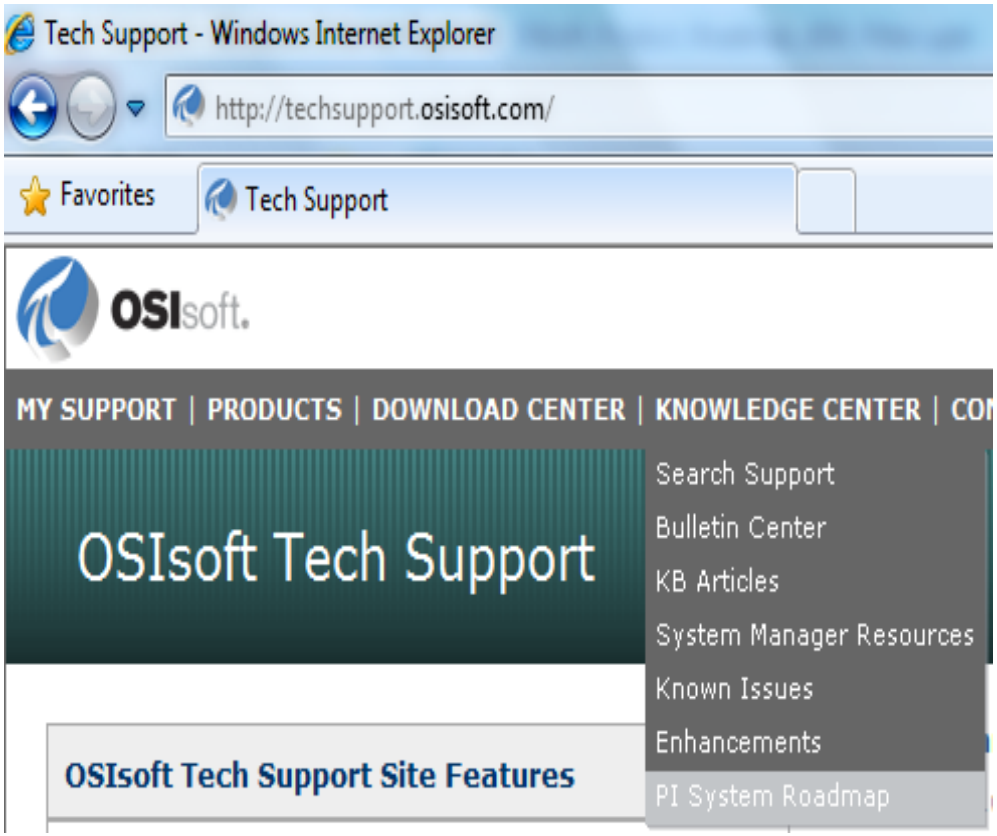
Our Demonstrations

• 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	Release in Q3
Interface	Released
• PI ProcessBook 2012	Release in Q2
• PI Coresight 2012	Release in Q3
• PI DataLink 2012	Released
• PI Web Parts 2010	

Stay Up-To-Date on the Web

- PI System Roadmap on OSIsoft Technical Support Site

http://techsupport.osisoft.com/techsupport/NonTemplates/roadmap.aspx



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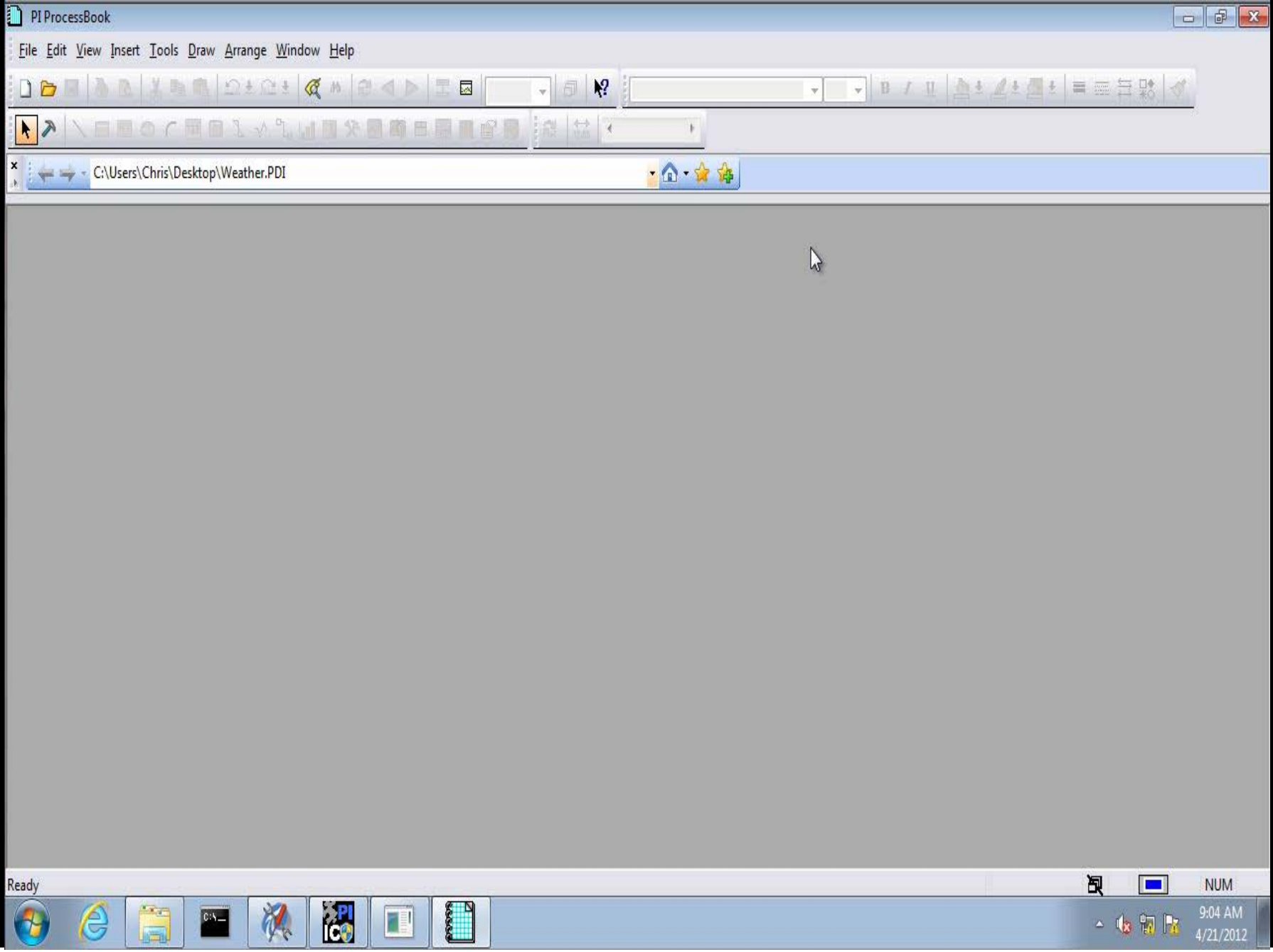
It's all about Imagineering



PI Coresight homepage

New Undo Redo Messages

RelatedEvents2

Help

EVENT FILTERS

Duration

Longer Than: 0 m

Shorter Than: 200 m

Category

- ✓ Excursions (4)
- ✓ Downtime (3)
- ✓ Product XYZ (1)

All None

Template

- ✓ Boiler Downtime (3)
- ✓ Boiler KPI Excursion (4)
- ✓ PIUnitBatch (1)

All None

Temp.Max

Greater Than: 0 C

Less Than: 100 C

Cart

Name	Start	End	Duration	Element	Category	Template	Reason Code	Temp.Max
Ex01	16-Dec-2011 23:05:48	17-Dec-2011 00:25:24	01:19:36	B-459	Excursions	Boiler KPI Excursion	High Temp	91.2
Ex02	17-Dec-2011 02:37:19	17-Dec-2011 04:12:07	01:34:48	B-459	Excursions	Boiler KPI Excursion	Low Pressure	54.1
DT45	17-Dec-2011 04:31:22	17-Dec-2011 05:20:34	00:49:12	B-459	Downtime	Boiler Downtime	Broken Thermo	32.4
DT46	17-Dec-2011 07:56:58	17-Dec-2011 08:19:46	00:22:48	B-459	Downtime	Boiler Downtime	Broken Thermo	31.7
DT47	17-Dec-2011 09:41:22	17-Dec-2011 10:52:58	01:11:36	B-459	Downtime	Boiler Downtime	Safety Shutdown	87.2
XYZ146	17-Dec-2011 13:12:34	17-Dec-2011 16:29:22	03:16:48	B-459	Product XYZ	PIUnitBatch		
Ex03	17-Dec-2011 19:28:58	17-Dec-2011 20:41:22	01:12:24	B-459	Excursions	Boiler KPI Excursion	High Temp	95.3
Ex04	17-Dec-2011 21:44:58	17-Dec-2011 22:45:46	01:00:48	B-459	Excursions	Boiler KPI Excursion	Low Temp	20.4

✓ Highlight Events