

REGIONAL SEMINAR SERIES

VALUE NOW, VALUE OVER TIME



Welcome to the Kansas City OSIsoft Regional User Seminar

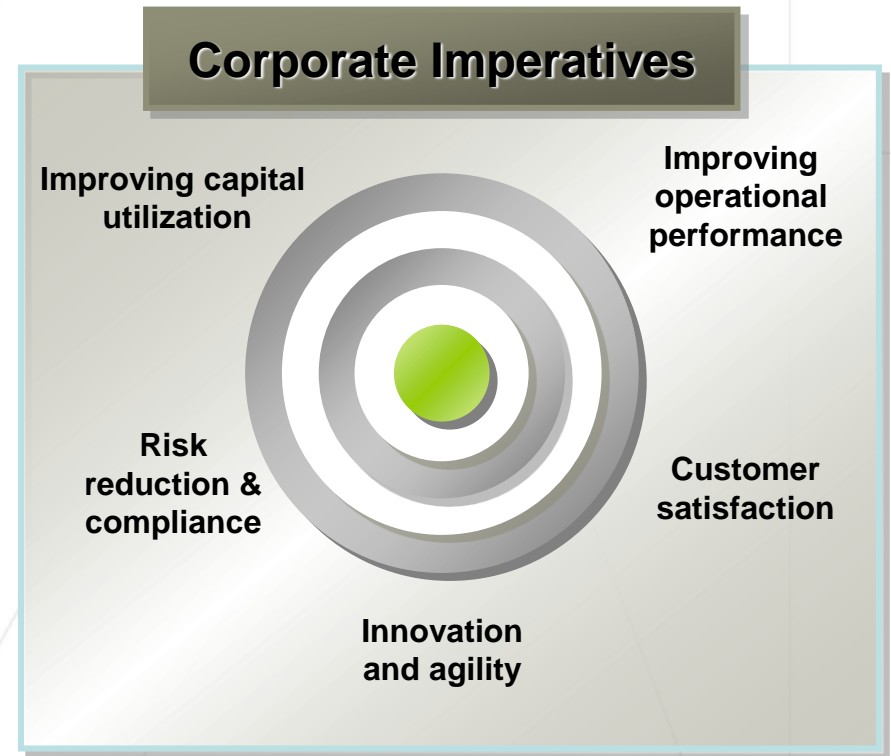
**Paul Hagan
Midwest Region
OSIsoft, Inc. St. Louis, MO**

In the beginning...

- House keeping
 - Cell phones
 - Questions
- PI Infrastructure - brief
- Agenda Review

Are these situations familiar to you?

- Limited operational 'visibility'
- Many versions of the same data
- Minimal business communication and collaboration
- Repeating the same mistake



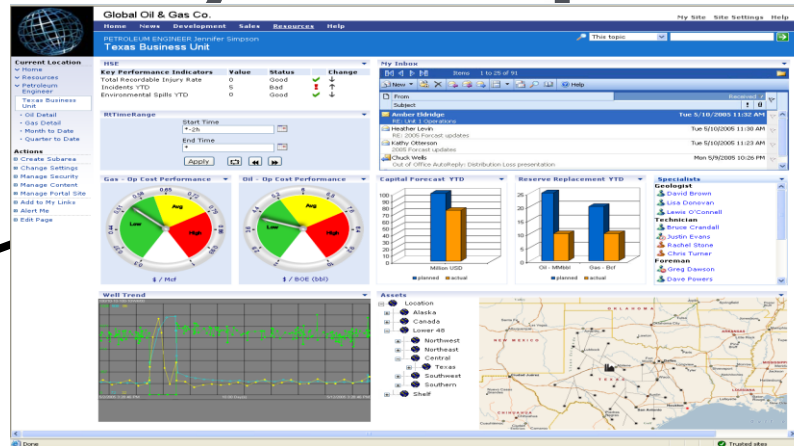
***Resulting in compromised Quality, Security, and Profitability –
Ultimately impacting the corporate bottom line***

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Evolutionary Enterprise Visibility

Inventory,
Supply Chain,
Market/ Cost Data



Production, Market, &
Supply Chain Data



- Energy Management
- Condition Based Maint.
- Production Management
- Environmental Compliance
- APC Monitoring

Production Operations Center of Excellence



- Production Awareness
- Asset optimization
- HSSE Monitoring
- Benchmarking
- Knowledge Management

PI provides an **agnostic enterprise IT platform** that enables scalable, evolutionary Biofuels value chain visibility, benchmarking, and optimization

Plant #1

Plant #2

Plant #3

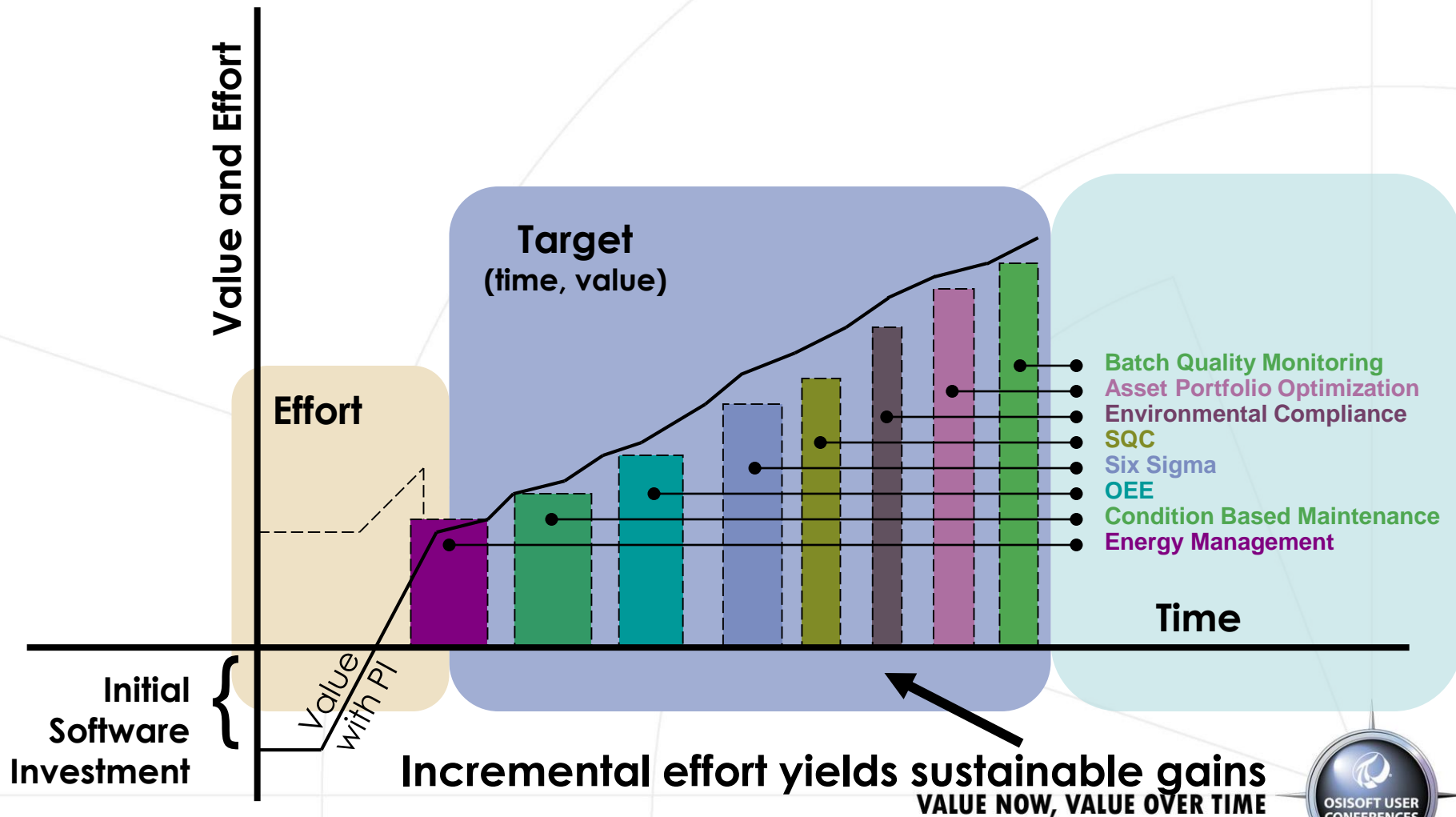
Plant #4

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Future Plants

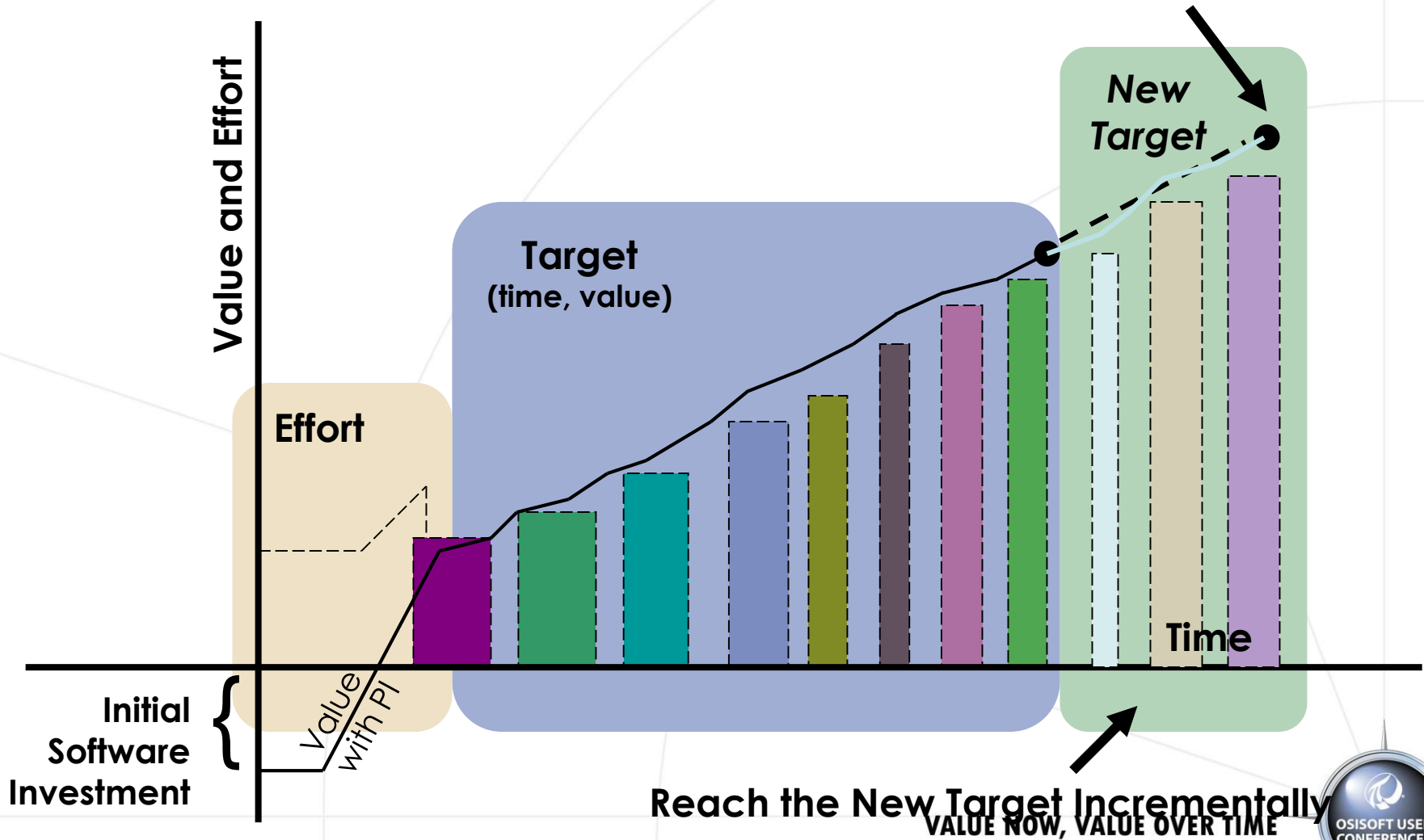


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New Value Targets will Appear



\$how Me the Money...

- Electrical – M&D Center \$8/\$1 invested per year
- Pulp and Paper – Energy Trading Desk \$18/\$1 invested per year
- Steel – Proactive vs Reactive Maintenance – 20% increase in Plant Availability
- Generation – Turbine Monitor – saved \$6MM on warranty issue
- Oil and Gas – Remote Model based Optimization – 10% Increase in Production from Platform

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Nourishing Ideas. Nourishing People.

8:40AM – 9:25AM

**PI – Infrastructure for High
Value Projects**

Mike Jones

Lumberton, TX

9:25AM – 10:50AM
RoadMap - The Server
Direction
(gimme a break...10AM)

Tom Hosea
OSIsoft Product Manager
“heeeere’s Johnny...”



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10:50AM – 11:30AM
Department of Energy Projects –
Securing PI and PI for Security

Dale Peterson
Digital Bond, Inc.

Is it lunch time yet?
11:45AM – 1:00PM in Pavilion 3



TIME



DTE Energy – Fleet Optimization



Monroe – 3,135 mw



Belle River – 1,260 mw



Trenton Channel - 730 mw



Performance Center – 11,588 mw



River Rouge - 527 mw



Greenwood – 785 mw

Generating Unit	Capacity Unit	Capacity Plant
Belle River 1	625	1260
Belle River 2	635	
Belle River		
Conners Creek 15	135	235
Conners Creek 16	100	
Conners Creek		
Fermi 2	1110	1110
Greenwood 1	785	785
Harbor Beach 1	103	103
Monroe 1	770	3135
Monroe 2	795	
Monroe 3	795	
Monroe 4	775	
Monroe		
River Rouge 2	247	527
River Rouge 3	280	
River Rouge		
St Clair 1	150	1409
St Clair 2	162	
St Clair 3	168	
St Clair 4	158	
St Clair 6	321	
St Clair 7	450	
St Clair		
Trenton Channel 7A	124	766
Trenton Channel 8	122	
Trenton Channel 9	520	
Trenton Channel		
Peakers	1224	1224
Totals:	10554	10554

Kodak – Energy Information



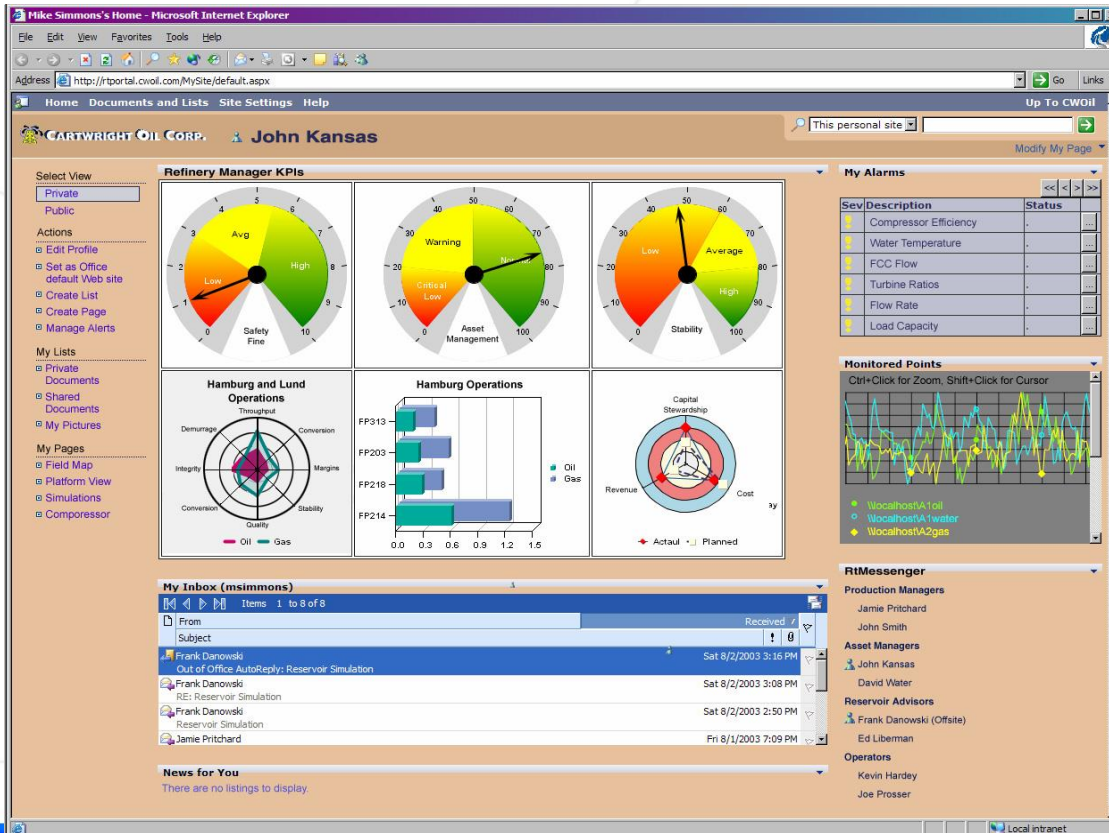
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OSISOFT USER
CONFERENCES

1:45PM – 3:15PM (break at 2:30PM)

Map the Metrics to the Person

Michelle Kuiee
OSIsoft Certified Guru



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3:15PM – 4:00PM

**How AEP is Approaching the
Information Management Crisis by
Leveraging
OSIsoft's Suite of Tools**

Kevin Stogran

Director Market

Operations Support



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4:30PM – 6:30PM
OSIsoft Technology & CISCO
ICI and ISR Appliances
– “I’ll drink to that...”

Matt Miller

OSIsoft Partner Manager

OSIsoft®



Let's Get Started...



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Technology is Integral to Corporate Culture

May 8th, 2008

H. Kevin Stogran

Director - Market Operations Support
OSISoft Regional Conference, Kansas City

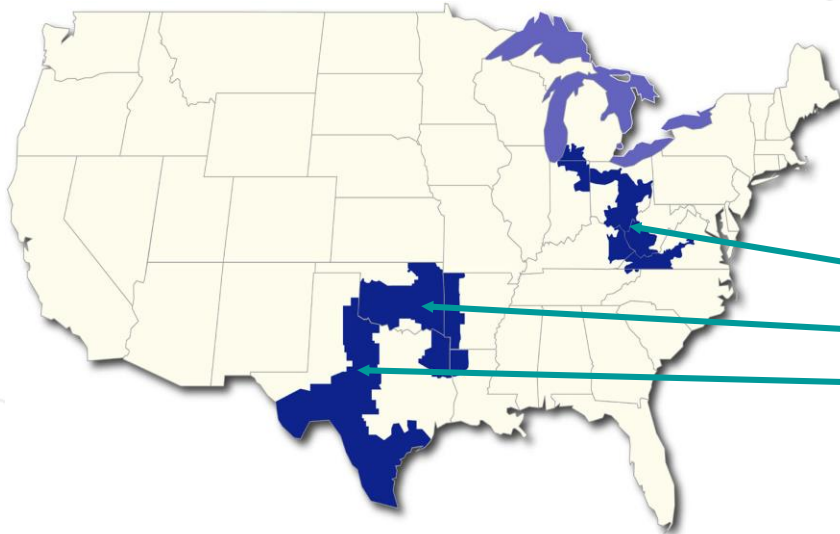
Agenda

- Who is AEP (American Electric Power)
- AEP's PI History and Footprint
- Information Management Challenges
- PI Display Examples
- AEP's Culture of Technology
- The Big Picture Challenge
- Technology Toolbox
- Portable Data
- Conclusion

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AEP – Who We Are – By Assets



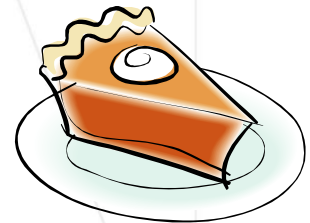
- One of the largest U.S. electricity generators (~ 38,000 MWs) with a significant cost advantage in many of our market areas
- Largest consumer of coal in the Western Hemisphere
- Operations within four RTO's
 - PJM
 - SPP
 - ERCOT
 - MISO
- A leading consumer of natural gas
- Major wind power developer (#3 in U.S. in 2005)
- 39,000 miles of transmission
- 186,000 miles of distribution
- Coal transportation
 - 7,000 railcars
 - 2,230 barges and 53 towboats
- 5 million customers

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PI History – Where Have We Been

- AEP began installing PI servers in 1993
- Five servers installed between 1993 – 1998
 - Conesville 5, Conesville 6, Conesville 4, Sporn 5, Muskingum 5
- Bank License 40,000 Tags (1998)
- Corporate PI server installed in 1999
- Most plant PI servers installed after 1999
- Plant's Question - How Do You Justify PI?
- The Annual Bank
- AEP “All you can Eat” Contract 2004 (aka EA)
- Development partnership with Transpara, 2006
- Current Contract 2007-2009



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AEP's Current PI Footprint

- **Servers**

- 4 Corporate PI Server
- 49 Plant PI Servers
- 2 Plant Simulator PI Servers
- 3 Transmission PI Servers
- 2 IT Monitor PI Servers
- 60 Total PI Servers

- **PI Tags**

- AEP total tag usage is about ~ 500,000 tags
- Plant PI servers have over 325,000 Tags
 - Plants server tag counts range from 75 tags to over 20,000 tags
- Corporate PI server has over 75,000 tags
- IT Monitor server has over 70,000 tags
- Transmission PI servers have over 50,000 tags

- **Processbooks**

- No Idea Anymore!
- Control Access As Needed, Not Desktop Applications.

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Information Management Challenges

- Aging Workforce
 - Provide Smart Displays
- Improve Information Management
 - Millions and Millions Points of Data!
- How Do We Use Information to Be:
 - More Productive ?
 - Retain / Expand Knowledge and Experience ?
 - More Cost Effective ?
 - More Responsive to RTO Market Needs
 - **Process More Data with Same Staff.**
 - **Be Aware of Market Conditions and Current Situational Awareness**

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Conventional PI Development

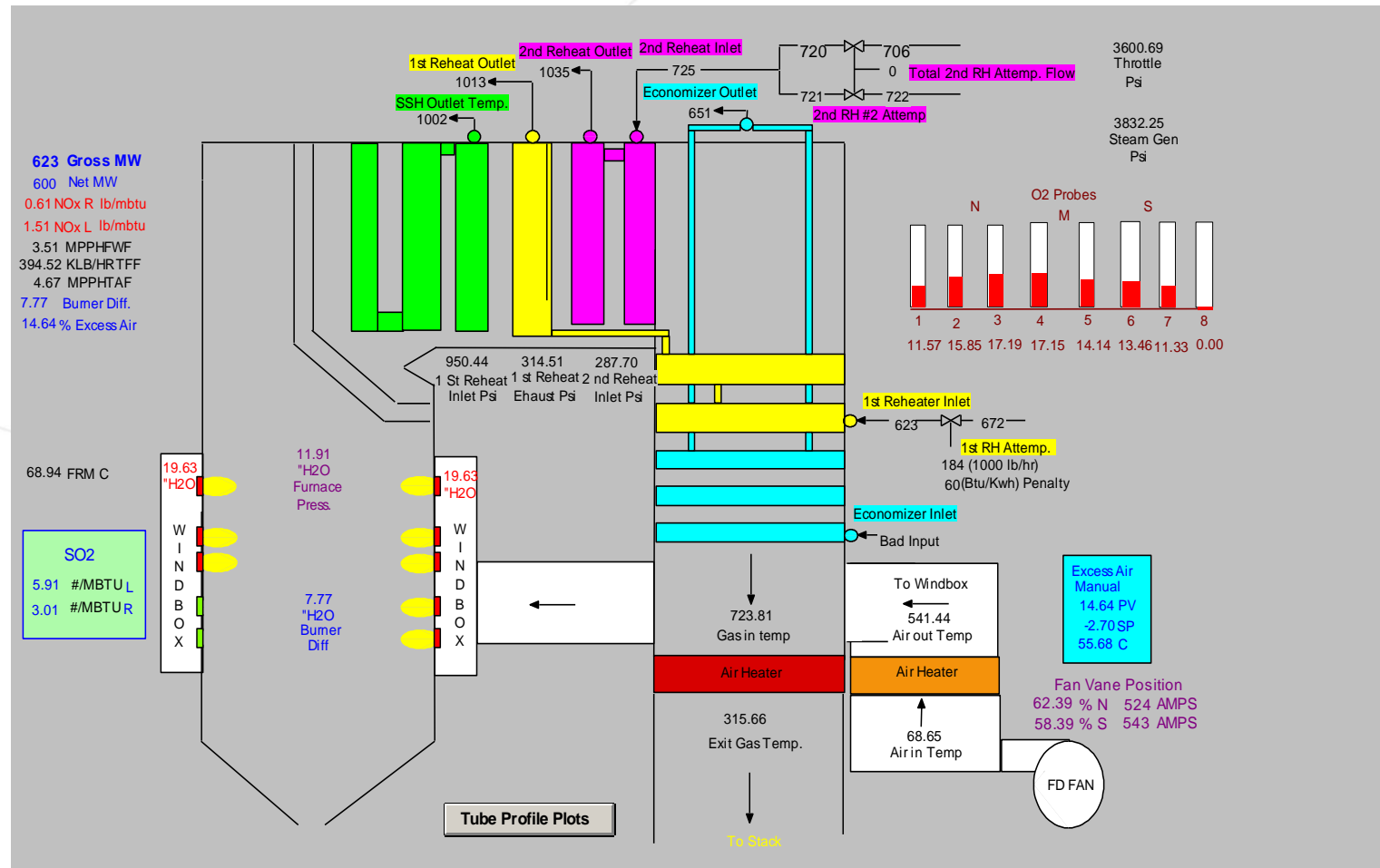
PI Helps Control Production Costs

Controllable Cost	Units	Actual	Target	Design	Deviation from Target (Btu/Kwh)		Cost (\$/Shift)	Total (\$/Shift)
Main Steam Pressu	PSIG	1,985	2,000	2,000	-50	150	\$6.48	\$-0
Main Steam Temperat	F	976	962	1,050	-50	150	\$-32.04	\$-2
1st RH Steam Temperat	F	976	948	1,050	-50	150	\$-59.76	\$-3
1st Reheat Attemperat	lb/hr	1,079	0	0	-50	150	\$1.86	\$0
Excess Ai	%	21.4	19.8	14.0	-50	150	\$20.86	\$-1
Exit Gas Temperatu	F	359.4	329.7	305	-50	150	\$150.12	\$17
Steam Coil Air Heaters								
Condensate	in. of HG	1.13	0.92	0.77	-50	150	\$64.98	\$8
HP Feedwater Heate	Btu/Kwh	5.2	0	0	-50	150	\$8.61	\$1
LP Feedwater Heaters								
Auxiliary Power	Mw	14.33	16.08	15.41	-50	150	\$-186.90	\$-13
Total Operator Controllable C					-50	150	\$-25.79	\$6

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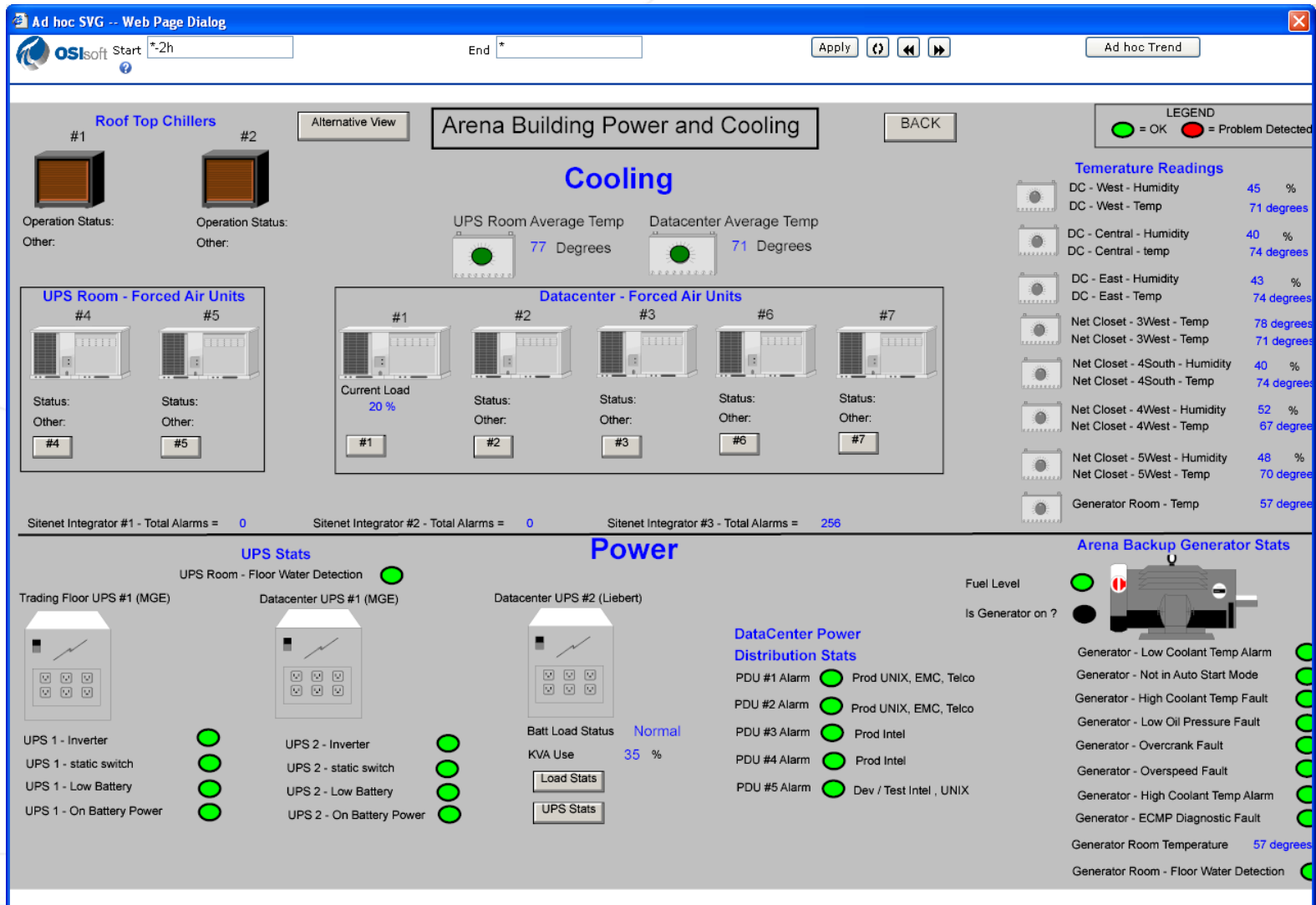
PI Brings Diverse Data to One Graphical View



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Building Diverse Monitor Capability (RTWebParts)



AEP Processbook Menu

To open a Processbook or Display click buttons below. Clicking multiple buttons will open multiple books or displays. Book buttons open Processbooks that contain multiple Tabs and Multiple displays, Display buttons open single displays.
Note: Corporate PI (oh0coa30) requires a password, plant PI system require no password.

PI Processbook version 3.0 Features

Your Default PI Server is OH0COA30

Dispatcher Processbooks **These Processbooks for Corporate PI Users Only**

PJM Book	SPP Book	ERCOT Book	Transpara	Ceredo Book	Sweeny Book
Hydro	Gen Support	ECAR/SPP CPS2		Darby Book	Waterford Book
SPP Fuel				Lawrenceburg Book	
Restricted PJM Financial / Requires Special Password			Transpara Rotate	Mattison Book	
Corporate PI Status	Switch To/From DR	Rotate HTML/Procbook Displays		Mone Book	

Plant Menu's or Official Plant Books **New, More Coming Soon**

Amos	Cardinal	Clinch River	Cook	Glen Lyn	Mountaineer	* AdHoc Trending
Kanawha	Picway	Rockport 1	Rockport 2	Sporn	Tanners Creek	

Note: These books come from the plants, some books are large, can take 1 minute to load.

Plant NOx Displays (This data from Plant PI systems)

Amos 3 NOx Display	Big Sandy 2 NOx Display	
Cardinal 1 NOx Display	Cardinal 2 NOx Display	Cardinal 3 NOx Display
Gavin 1 NOx Display	Mountaineer 1 NOx Display	

Plant Operations management (OM) Books (This data from Plant PI systems)

Clinch River OM book	Mountaineer OM book	Musk River 1 OM book	Musk River 2 OM book
Musk River 3 OM book	Musk River 4 OM book	Musk River 5 OM book	

General Plant Display/Books (This data from Plant PI systems)

Musk River Displays

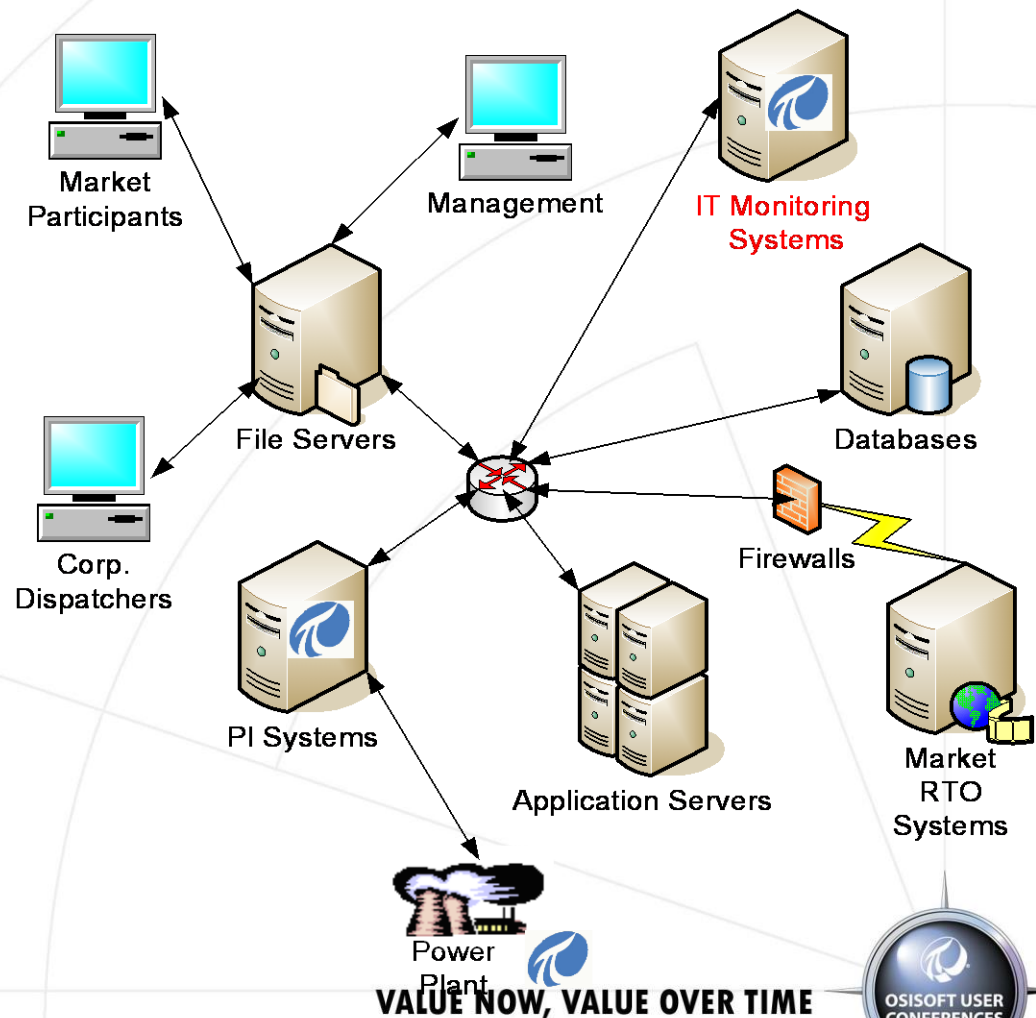
Plant Acoustic Leak Detector Display/Books (This data from Plant PI systems)

	Conesville Acoustic Leak Display	Gavin Acoustic Leak Display
Mitchell Acoustic Leak Display	Muskingum River Acoustic Leak Book	Rockport Acoustic Leak Book



IT Monitor of Critical Systems

- **IT Monitoring**
- Corporate and Plant PI Server Monitoring
 - Hardware statistics (CPU Use, Memory Use, Network, etc)
 - PI statistics (Snapshot, Archive, Cache, Interfaces, etc.)
- Backup Generator and Inverter Monitoring
- Computer Center Temperature and Humidity Monitoring
- 70,000 Tags in One Year.
- Used to Measure Business Disruptions for IT's ICP



AEP's Culture of Technology

- Use technology to enhance and expand our staff's capability and maintain headcount (FTE's)
- Single point of data entry, and share that data and it's context.
- It's better to have too much data than not have what you need after the fact. When in doubt, store it.
- Simplify the user's interface and experience.
- Get the data to the right person, at the right time.
- Understand the "True Costs" of technology and the data experience.
- Empower the staff to use technology, don't top down constrain them.
 - AEP's Contract – encourage the use of technology; don't discourage it.
 - Transpara grass roots expansion.

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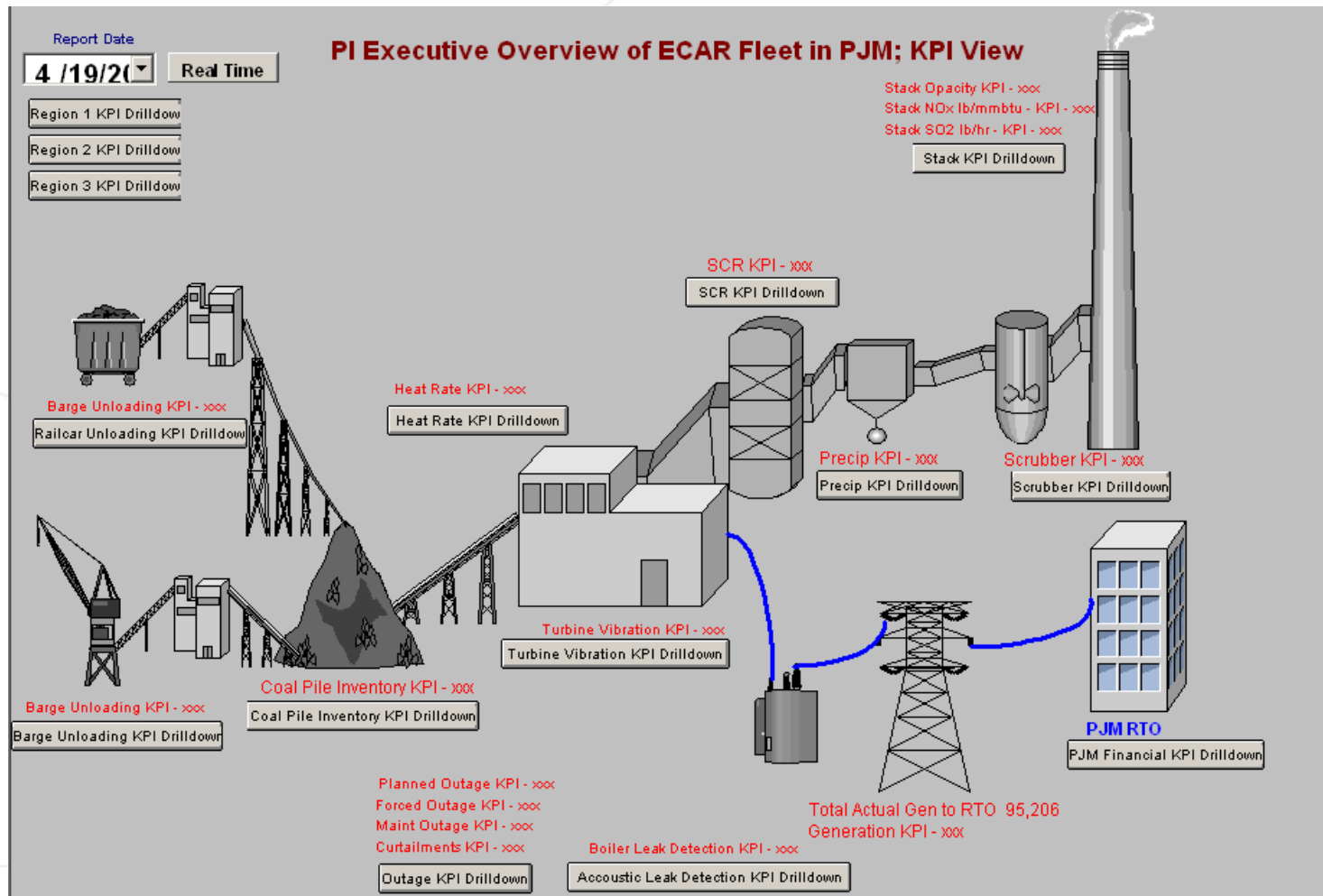
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The Road Ahead in PI Development

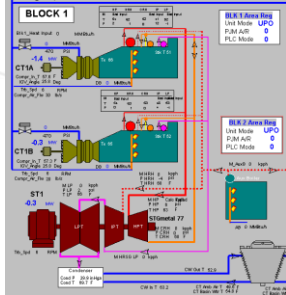
The Challenge

Provide Those That Need The Data The Big Picture



The Technology Toolbox

- Provide the Technology
 - Eliminate the Roadblocks
- Provide the Drive
- Enable the Team to Get It Done



ProcessBook



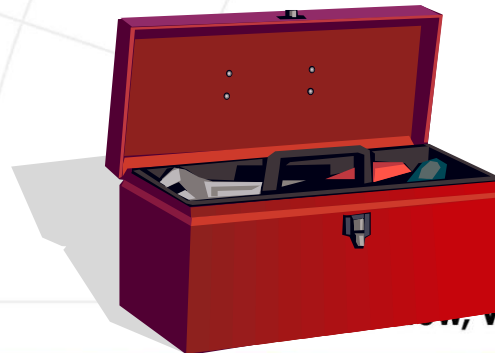
Transpara



PI Server



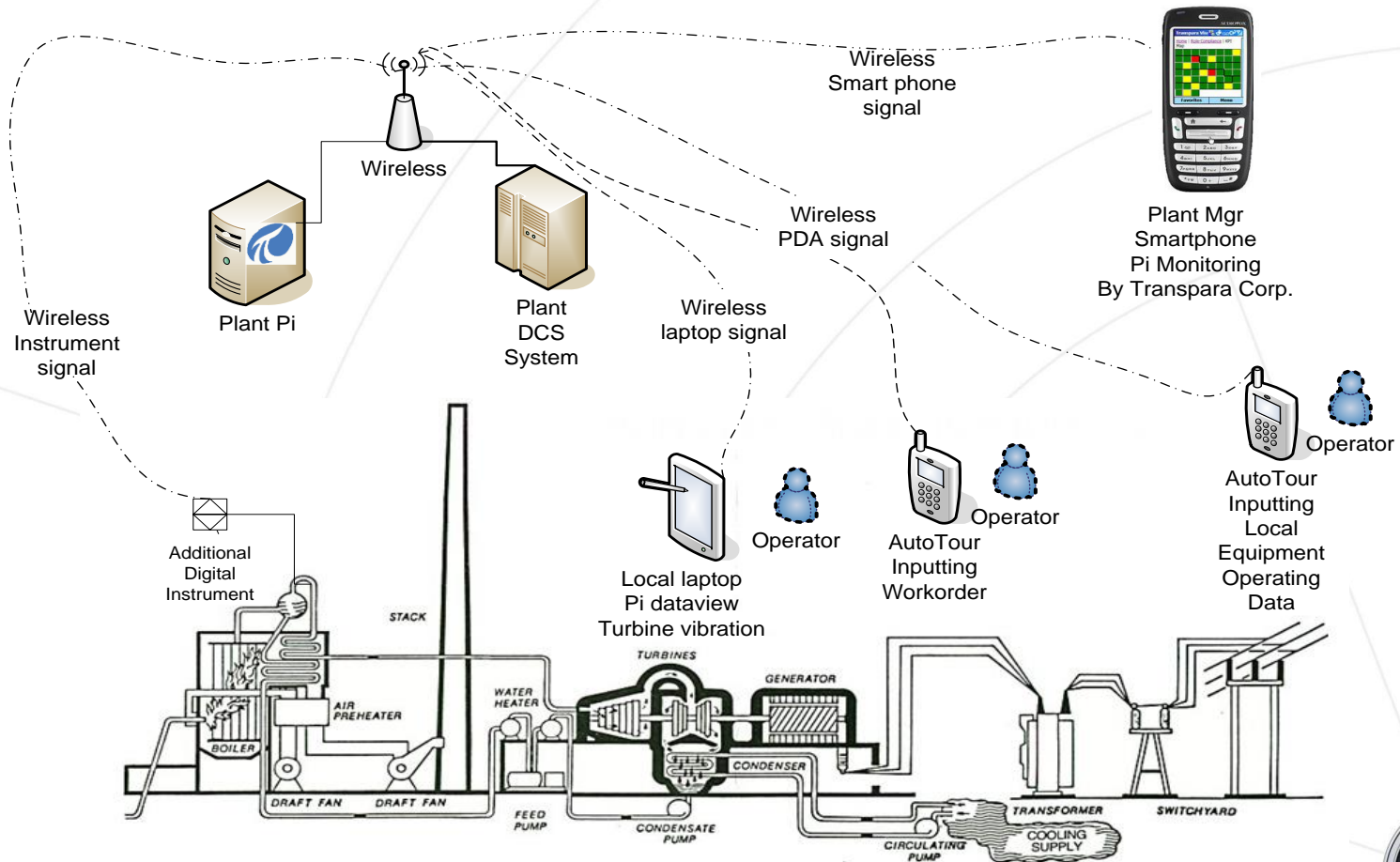
SharePoint



ROI, VALUE OVER TIME



Wireless Potential in a Power Plant



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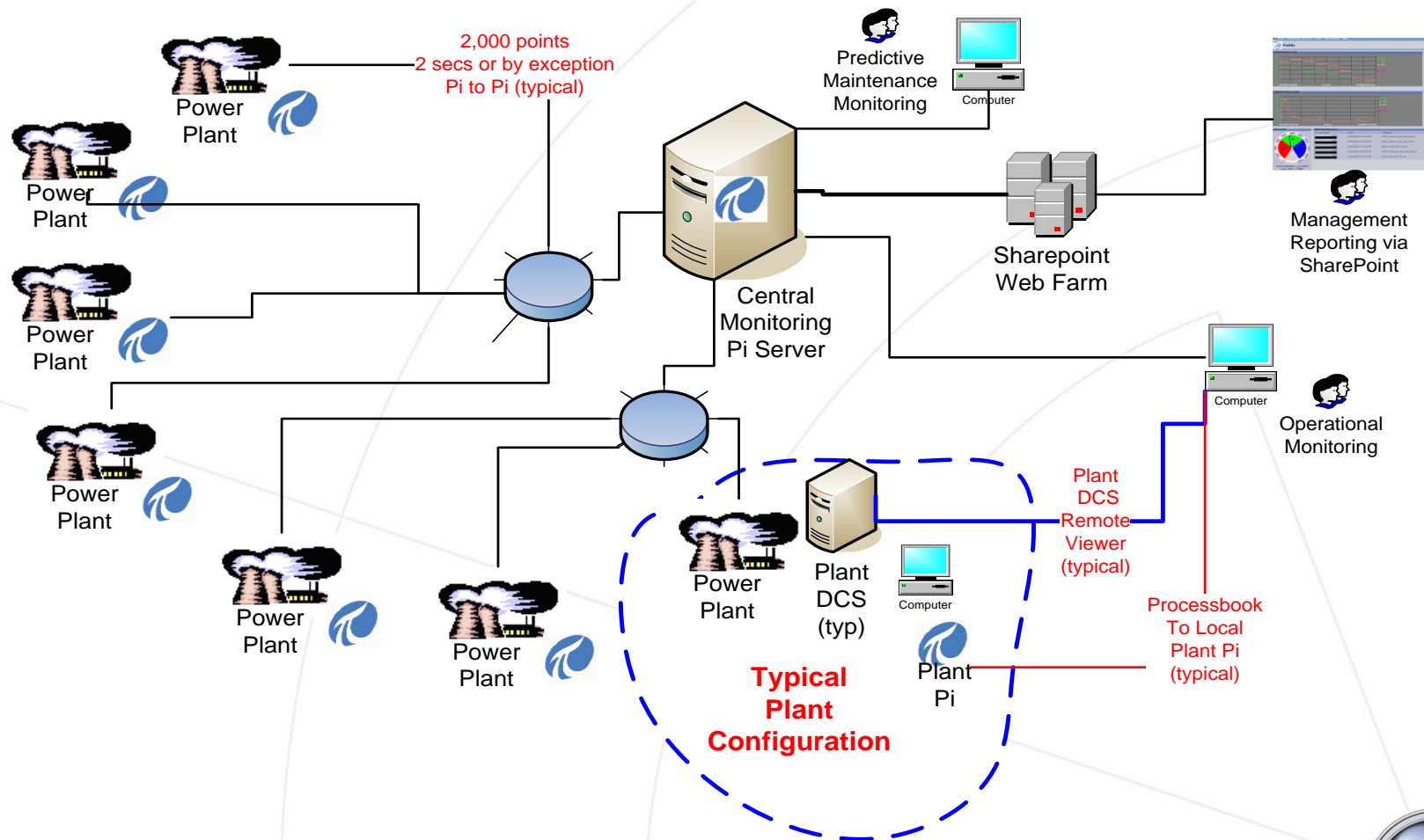
Centralized Data Monitoring



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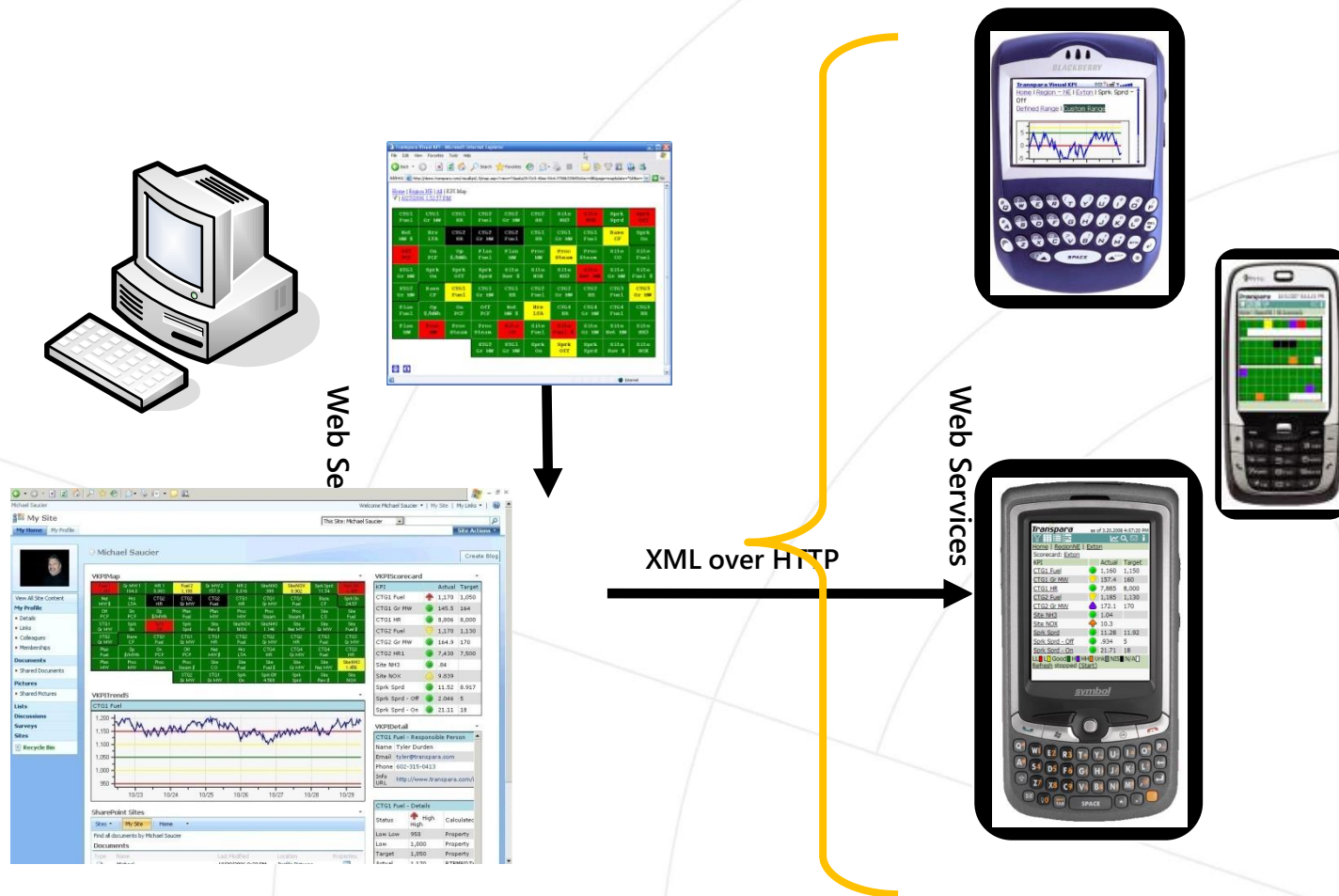
Central Monitoring Network Backbone (typical)



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Portable Data – Transpara / PI



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Transpara – Plant PI Ping Status

Transpara Visual KPI - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Print Mail News RSS Feeds

Address http://oharenaiv007:8170/OperServ/map.aspx?view=b070a0f7-29b6-4d58-9699-4aecdd0fd5c&sc=All&filter=8group= Go Links

[Home](#) | [Plant PI Status](#)

8.21.2007 8:49:25 AM

AM 1 6	AM 2 5	AM 3 5	ARS 44	BS 1 59	BS 2 12	CD 79	CE 31
GV 1 111	GL 13	FLC 29	CV 56 2	CV 4 2	CV 3 2	CR 11	CPS 31
GV 2 104	KM 9	KR 8	KXL 47	LW PI 57	LBM 48	ML 8	MN 26
RP 1 55	PRK 53	OKL 93	N34 26	N12 26	MT 1 10	MR 5 7	MR 14 7
RP 2 67	RVS 26	SP 305	SWS 33	SWY 52	TC 106	TPS 25	WF 6
					WSH 46	WPS 30	WLK 48

Low Low ☐ Low ☐ Good ☐ High ☐ High High ☐ Unknown ☐ Not In Service ☐ N/A ☐

javascript:ShowKPI('true','1277','b070a0f7-29b6-4d58-9699-4aecdd0fd5c','838a66a4-42e3-46aa-9620-9a8fd6ebc95b','Ping Times - fr

Local intranet



Monitoring of Critical Systems



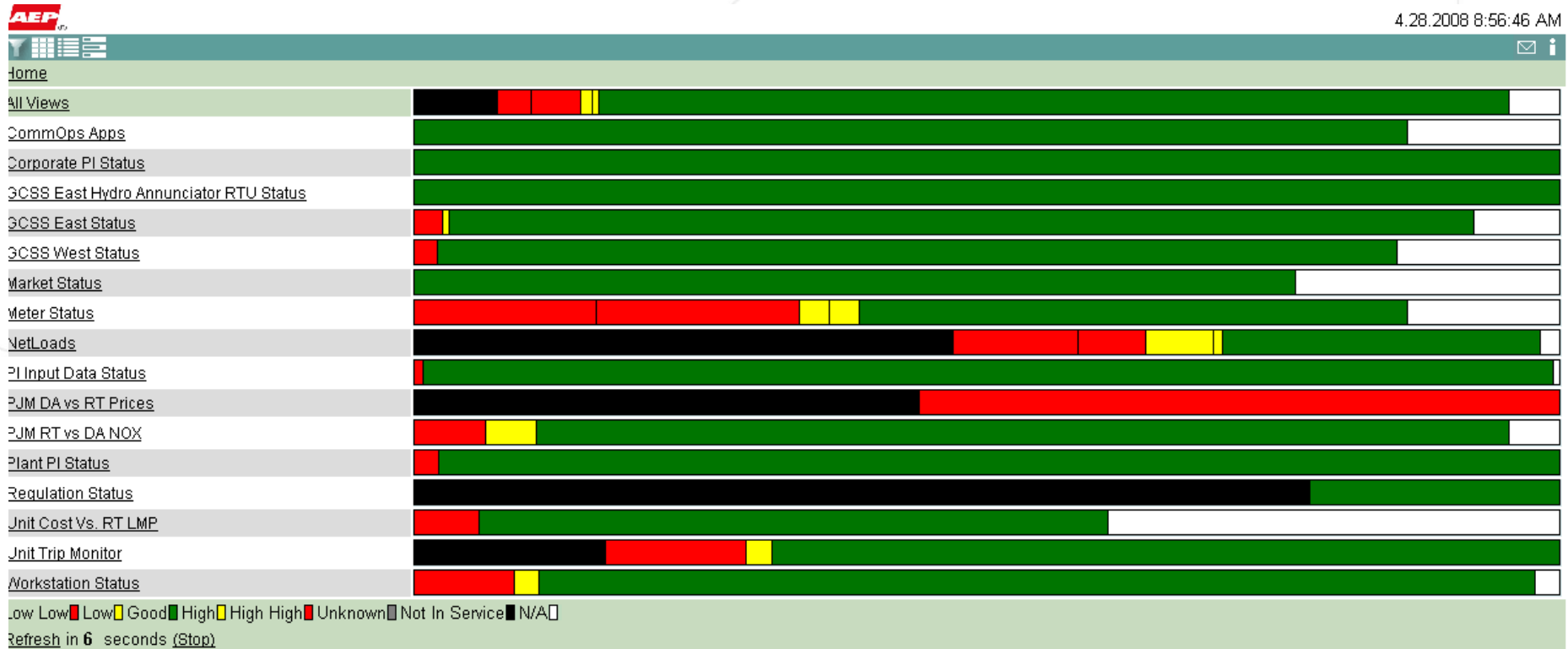
4.28.2008 8:54:23 AM



Home | GCSS East Status | All Scorecards

Scorecard: PJM RTU Summary													
ORP 1	GRP 0	AOC (HYD) 0	MIC (HYD) 0	HYD Alarm 0									
Scorecard: PJM RTU ORP (1RP) Status													
BS1 RTU	BS2 RTU	CR1 RTU	CR2 RTU	CR3 RTU	CV5 RTU	CV6 RTU	GL5 RTU	GL6 RTU	KR1 RTU	KR2 RTU	MR1 RTU	MR2 RTU	MR3 RTU
MR4 RTU	MR5 RTU	RR1 RTU	RR2 RTU	SM RTU	SP2 RTU	SP4 RTU	SP5 RTU	SP3 RTU	TC1 RTU	TC2 RTU	TC3 RTU	TC4 RTU	Flat Line Status
Scorecard: PJM RTU GRP (Groveport) Status													
AM1 RTU	AM2 RTU	AM3 RTU	CD1 RTU	CD2 RTU	CD3 RTU	CV3 RTU	CV4 RTU	GV1 RTU	GV2 RTU	KM1 RTU	KM2 RTU	KM3 RTU	ML1 RTU
ML2 RTU	MT1 RTU	PC5 RTU	WFTR RTU	Flat Line Status									
Scorecard: PJM RTU MIC (Mich Hydro) Status													
BEHYD RTU	BUA1 RTU	BUA2 RTU	CO RTU	ELHYD RTU	MO RTU	TW RTU	Flat Line Status						
Scorecard: PJM RTU AOC (Roanoke Hydro) Status													
APLOC RTU	BUHYD RTU	BYPLC RTU	CLHYD RTU	LEHYD RTU	LOHYD RTU	LORAKE RTU Non Critica	MAHYD RTU	NIHYD RTU	RAHYD RTU	REHYD1 RTU	REHYD2 RTU	RVRGAGE RTU	SMHYD1 RTU
SMHYD2 RTU	WIHYD RTU	Flat Line Status											
Scorecard: PJM System Overview													
HOST A Enabled	HOST B Standby	OAG A Standby	OAG B Enabled	HOST A Avail	HOST B Avail	OAG A Avail	OAG B Avail	SCAD FREQ	DB Valid	DB Up To Date	MRS to Standby	MRS to EHA.dr	MRS to EHB.dr
Scorecard: PJM SDG Communication Status													
TFE GCS	CH GCS 1	SDG ORPA1	SDG 1RP1A	SDG 1RP1B	CH GCS 2	SDG GRPA1	SDG GRP1A	SDG GRP1B	CH GCS 3	SDG AOC	SDG AOC1A	SDG AOC1B	CH GCS 4
SDG MIC	SDG MIC1A	SDG MIC1B											
Scorecard: PJM EAST SMP Communication Status													
DB Ping OK	DB RTU	Lw Ping OK	Lw RTU	WF Ping OK	WF Tag Not Fo	CK1GR0 RTU	CK1AUX RTU	CK2GR0 RTU	CK2AUX RTU				

KPI Map – Full Overview



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Conclusion

- The Future is Upon Us !
 - We Intend to Use Information Technology to Make Us:
 - More Effective !
 - More Responsive !
 - More Flexible !
 - More Profitable !