

Realizing Value with The PI System and PI CoreSight in Heat Recovery

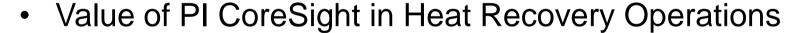
Presented by Ralph Kremer Scott Larson



Agenda



- SunCoke Energy at a Glance
- Coke Making 101
- Our History with the PI System

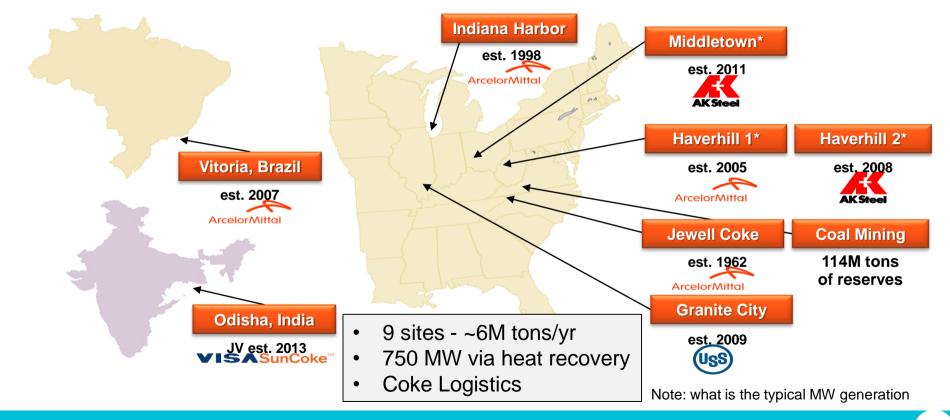


- Illustrative Examples
- Concluding Remarks



Largest Independent Metallurgical Coke Producer in the Americas

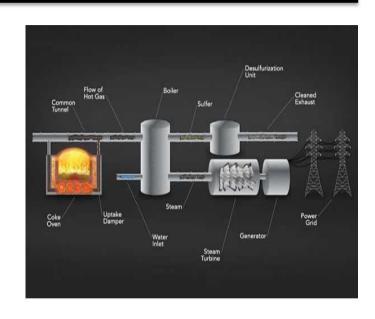




The Making of Coke... and Energy



- Thermal Decomposition of Coal
- Heat Recovery from Flue Gas
- Power Generation
- Coke Logistics
- Safety & Efficiency are paramount



Coke Making 101

Value Now, Value over Time with the PI System



- First Installation at Haverhill Operations in 2009
- All Plants installed October 2011
- Increasing use and value 2009-2011
- Enterprise Agreement(EA) signed in 2012
- Perspective on the EA
 - Supported a refocus on "value from vs the cost of" the PI System
 - Helped reduce the cost of curiosity
 - Enabled quicker development and rollout of applications broadly
 - Accelerated value realization and sustainment
 - Enabled normalization and simplification of data securely & broadly
 - Supported SunCoke Energy's vision of the importance of information



Benefits of PI Coresight



Multiple Methods of Information Delivery



- Each person understands information in a different way.
- Providing multiple methods can make a seemingly difficult concept easier to understand.
- For some Operators and Supervisors, <u>keeping the information as</u> simple as possible makes it easy for them to make complicated decisions.

Benefits of PI Coresight



- Operations Team has a parallel data tool
 - Monitoring of Plant Performance
 - Troubleshooting of Systems & Equipment
 - Operators, Supervisors, Engineers, & Managers can create unique pages
- Non-operations personnel can access plant information without accessing the "DCS" Distributed Control System
 - For Operations Team, ensures no unauthorized access to DCS operations
 - For Engineers, Maintenance, & Operations' Support, allows continuous monitoring of all facilities

SunCoke Energy Uses for PI Coresight:



- Daily Monitoring of Key Performance Indicators (KPI)
- Weekly Trend Analysis of KPIs against KPI Contributors
- Troubleshooting of Step-Changes in KPIs & Non-KPIs
- Root Cause Analysis for Plant Issues & Equipment Failure
- Comparing Unit to Unit & Facility to Facility Performance
- Analyzing Data during Test Trials



Embedded PI System Screens in the Operations Console to Augment the DCS information

"Supervisor Screen"





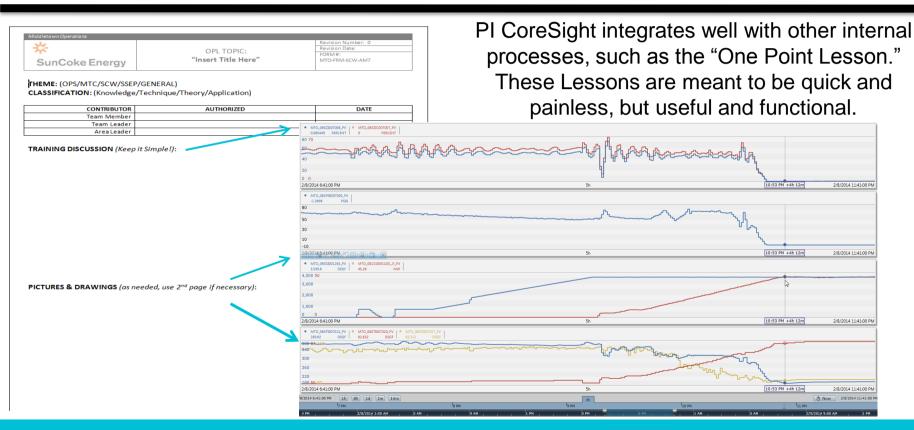
"Operation Specific Screen" – HRSG Shut Down





"Training Screen"

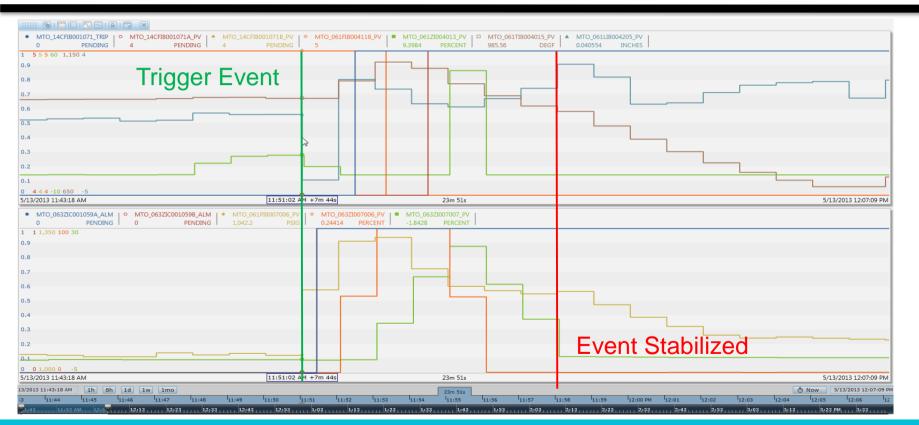




Root Cause Analysis -



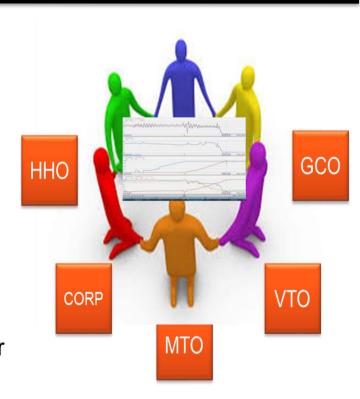




Work Stream Utilization

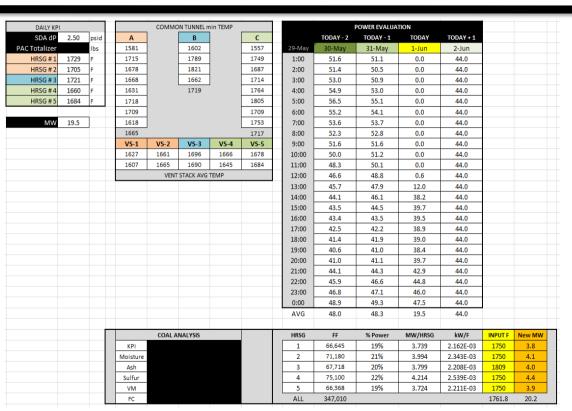


- Operations Teams from each SunCoke facility work together, utilizing similar tools, speaking similar language - "The Language of Pl."
 - Each facility can interact with the others, looking at company-wide KPIs.
 - Allows 3 times as many technical eyes to view and analyze the same information.
 - Troubleshooting operational issues can be better attended.



Predictive Monitoring





- Able to analyze plant information against an "Ideal Plant" and the "Real Plant."
 - From that process, develop a predictive model on where we will be over the next 24 hours.

Critical for estimating power generation on an open market

Automatic Reports



START				
1/1/2014				
STOP				
1/8/2014				

		1	
	HRO		
	MW - AVG	42	MW
	MW - Peak	55	MW
	Steam Flow - AVG	337,904	pph
	Steam Temp - AVG	901	F
	Steam Press - AVG	1071	psig
	Vacuum - AVG	-13.7	psig
	HRSGs		
	HRSG #1 Inlet Temp - AVG	1660	F
	HRSG #1 Inlet Temp - AVG	1597	F
	HRSG #1 Inlet Temp - AVG	1667	F
	HRSG #1 Inlet Temp - AVG	1621	F
	HRSG #1 Inlet Temp - AVG	1612	F
M			
M			
M			
M			
	SDA DP	2.8	psid
	SDA Outlet Temp	260	F
	SDA Approach	127	F
M	SDA Approach Set-Point	120	F
	SDA Dew-Point	133	F
	HRO		
M	Soot Blowers Black Locked	0	#
М	Maintenance Hours	121	Hours

 Development of standardized and customized reports for pass through to upper levels of management.

E-Mail Notification of Specific KPI Targets



Name: Start Push

Start Time: 3/5/2014 10:11:03 PM Central Standard Time (GMT-06:00:00)

Trigger Time: 3/5/2014 10:11:03 PM Central Standard Time (GMT-06:00:00)

Target: Ovens

Trigger Input: Oven Charged

Oven: 84

Major Benefits



- Improving Analytical Capabilities:
 - Crew to Crew, Area to Area, Facility to Facility, across Work Streams
- Improving Predictive Capability of Steam & Power Generation

- Improving Operator Training & Development
- Improving the Root Cause Analysis Process

Enhancing Information Distribution & Collaboration with PI Coresight

"The PI System is critical to the safe and efficient operations of our coke making, heat recovery systems, and coke logistics systems.

PI Coresight extends the value securely from our PI System significantly by simplifying and standardizing how data and information is distributed and shared outside the PCN. PI Coresight has been a game changer at SunCoke Energy"



Business Challenge

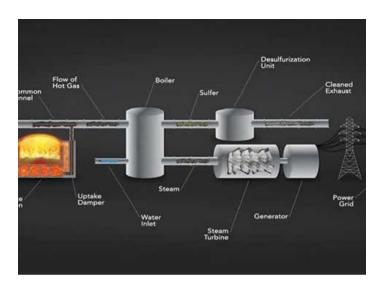
- Securing PCN data access
- No simple & standard way to display and report process data
- Need to continuously improve safety & efficiency via KPIs
- Need for reactive & proactive analytics with predictive capability





Solution

- Leverage installed PI System for secure data access to PCN
- Evolved PI AF as the foundation for our data analytics and predictive capabilities
- Leveraged PI Coresight for standard, simple, in context data visualization and reporting



Results and Benefits

- Secure access to PCN data
- Simplification and standardization of visualization and reporting
- Significantly improved analytics, predictive capability, collaboration and work stream utilization
- Step change in safety and efficiency of operations

Concluding Remarks



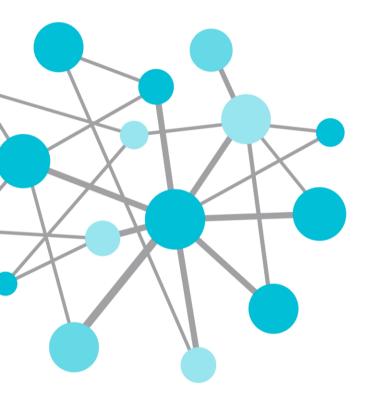
- Use of PI AF and PI Coresight have been game changers
- EA has accelerated value creation from the PI System
- Enabled a collaborative, data decision based culture focused on continuous improvement
- Increased safety and efficiency of our value chain

Contact Information



- Ralph Kremer
- Heat Recovery Area Manager
- rskremer@suncoke.com

- Scott Larson
- Information Technology Systems Analyst
- sdlarson@suncoke.com



THANK Y()

