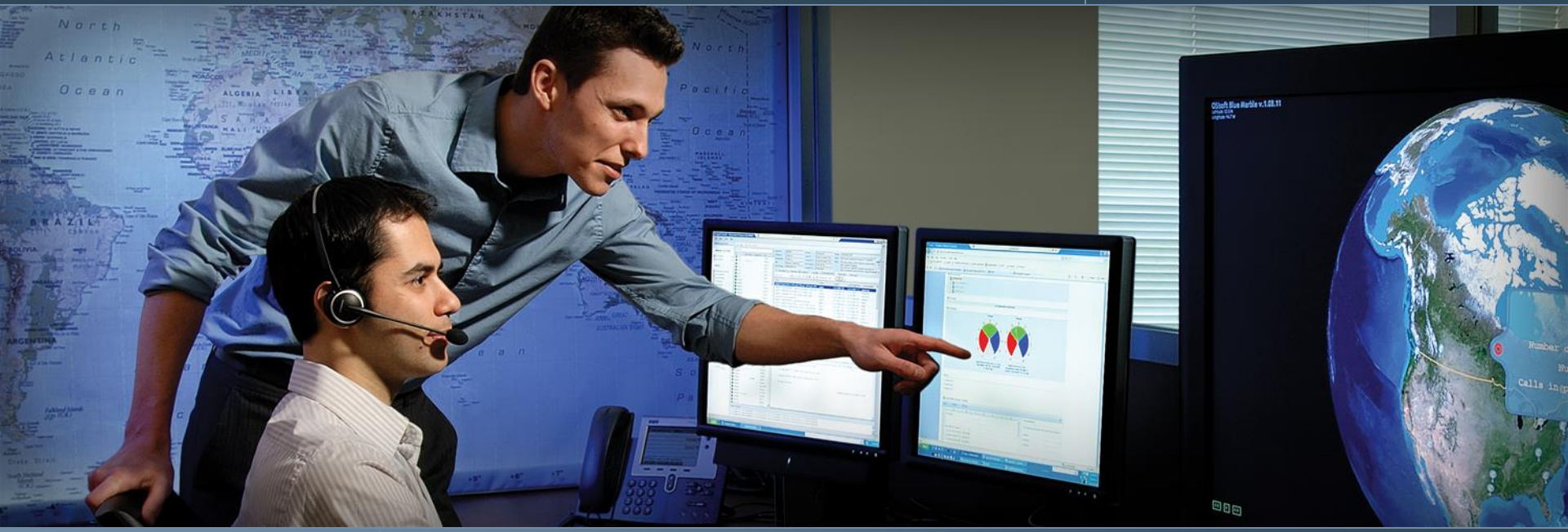
OSIsoft®

Regional Seminar Series



Value Now with Enterprise Services

Beth Murray
Enterprise PI Administrator
RockTenn

11-August-2009

Empowering Business in Real Time.

Overview

- RockTenn – Who & Why
- Justification
- Implementation
- Adoption & Utilization
- Results
- What's Next for PI at RockTenn

Who is RockTenn?

- One of North America's leading manufacturers of paperboard, containerboard, consumer and corrugated packaging and merchandising displays
- Annual net sales of approximately $3 billion
- Founded in 1936 and operates manufacturing facilities throughout the United States, Canada, Mexico, Argentina and Chile
- 11 Recycle Paperboard Mills, 1 Recycle Container-board Mill, 1 Bleached Board Mill
- 90+ Converting Plants
- Headquartered in Norcross, Georgia

Challenges and Obstacles

Our Challenges

- Controlling Costs (Energy, Fiber, Labor, and Maintenance)
- Producing Consistent, High Quality Paperboard
- Operating at Maximum Reliability and Efficiency
- Using Data to Drive Process Improvement – Six Sigma

The Obstacles

- Mis- & Missing Information
- No History, No Visibility, No Real-Time Feedback
- You don't know you need the data, until you need the data

"The discouraging part of process improvement is trying to get a complete set of data together in one place. When it is too hard to get, you have to leave it out of the analysis. We are missing opportunities to act on information and save money"

General Manager, Cincinnati Mill

How Do We Remove Obstacles?

Implement a highly flexible and configurable enterprise-wide information system to:

- Collect and archive detailed, actionable data from all existing processes and systems
- Put data on any desktop, laptop or monitor across the company
- Provide tools for reporting and analysis
- Empower users to make informed decisions

Home Grown? **Third Party?**

The Proposed Solution . . .

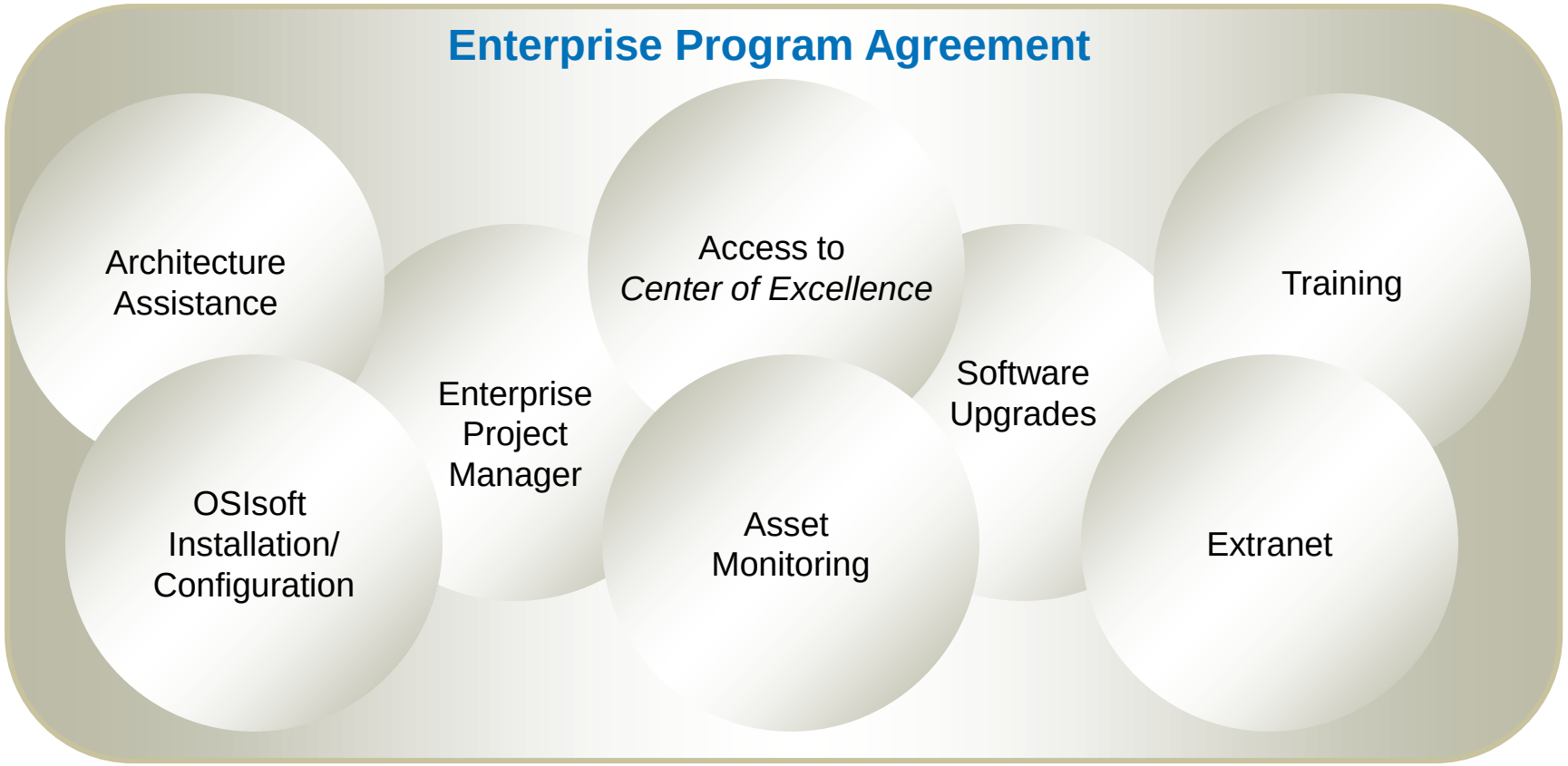
PI System

Enterprise Services

Enterprise Program Agreement Services

Under an executed Enterprise Program Agreement, customers have access to a cumulative knowledge base built upon 25 years as an industry leader.

Available services include:



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How Do We Justify the Investment?

Energy!

Actively pursue energy cost reduction through the capture and review of data to:

- Monitor and adjust process to run at higher efficiency
- Alert to energy excursions and correct them quickly
- Create an energy balance to find heat recovery opportunities
- Monitor and analyze energy market pricing to adjust plant consumption patterns
- Optimize energy per ton with other process inputs
- Determine unit ops energy cost and benchmark all mills

Why Energy?

- One of the top three costs

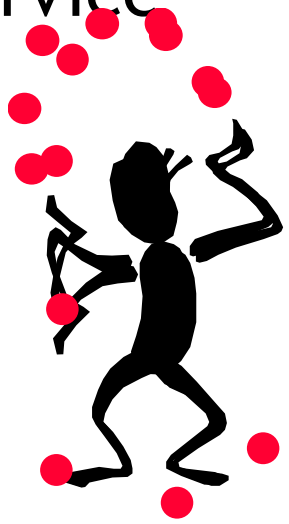
  Fuel – Fiber – Folks
- $170 million per year
- 19 million MMBtu equivalents per year
- 90% used by the 12 paperboard mills

We can't control the energy markets

We Can Control Our Energy Usage

Implementation Strategy

- Business Unit driven, not IT
- Deploy rapidly, 10 locations in 12 months
  - 11th installed March'09, 12th installed July '09
- Scope: Connect to what's available
  - Initially one of three types of process data
- Single internal resource = Reliance on Enterprise Project Mgr (EPM) & Field Service Engineers
- "Install it and they will come."
- Standardize or Customize?
- Plant-led development and adoption



RockTenn PI Installations

Installation Summary

- 10 Mill Locations + Corp. Office in first 12 Months
  - OSIsoft Field Service Engineer On Site 11 weeks
- 1 installed Q1 2009, 1 installed Q3 2009
  - OSIsoft Field Service Engineer Remote
- Average 750 connections per day
- >100,000 Tags
- 10 Different Interfaces
- 84 Interface Instances
- OSI Network Op Ctr (NOC)
- Quarterly Reviews
- Center of Excellence (CoE)

Interface	#	Site
PItoPI	25	All sites
OPC-DA	23	SP/BC/Cincinnati/Missisquoi/Stroudsburg/Seven Hills
RDBMS	6	HQ/Eaton/Missisquoi
Modbus	4	Dallas/Stroudsburg
OPC-HDA	3	BC/Demopolis
infi 90	1	Missisquoi
Davis Weather	1	St. Paul
DDE	1	Chattanooga
MXO	1	Cincinnati
PHD	1	Demopolis
Total	66	

Installation Details

We did not know what we did not know!

- Initial Schedule was too aggressive
- On site survey with plant engineer and IT
- The hardest part of the installation often determining how to connect to the data. Upgrades and OPC servers had to be purchased.
- Scheduled installation week with OSI.
- SMS deployment package for PI client software.
- Establish remote access to interface nodes.
- Allow OSI's NOC to log into our PI servers.

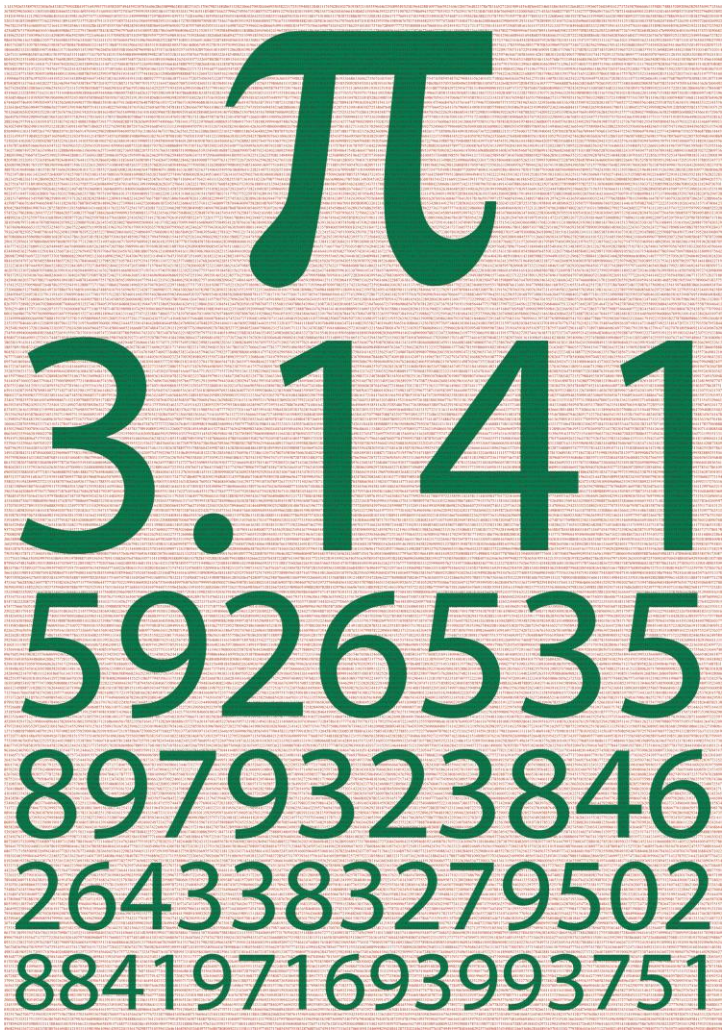
Getting Started

- Training and Awareness
  - What is PI?
  - Initial training during installation week
  - Purchased 6 laptops and wireless hub
  - Individual user specific training with CBTs & EA Training Vouchers
  - On-site group training with EPM, CoE & Learning Labs
  - Power Users: tag admin and advanced topics

What is PI?

Pie? Mmmm. Blackberry.

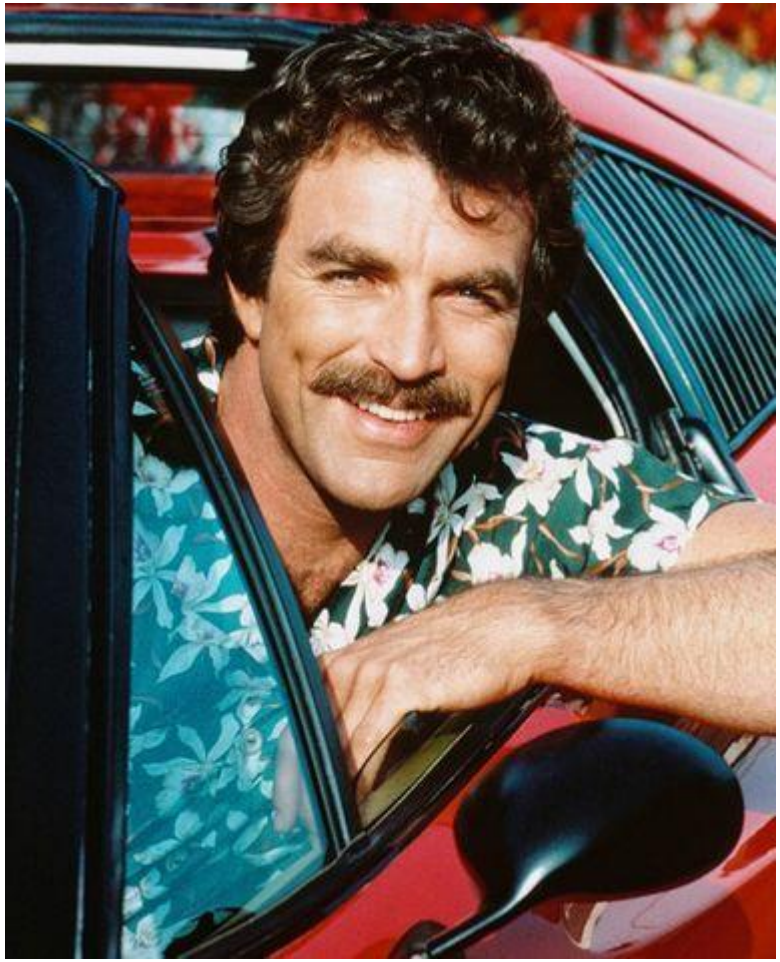
An Irrational Number?



Something Greek?

A Private Investigator? Sort of . . .

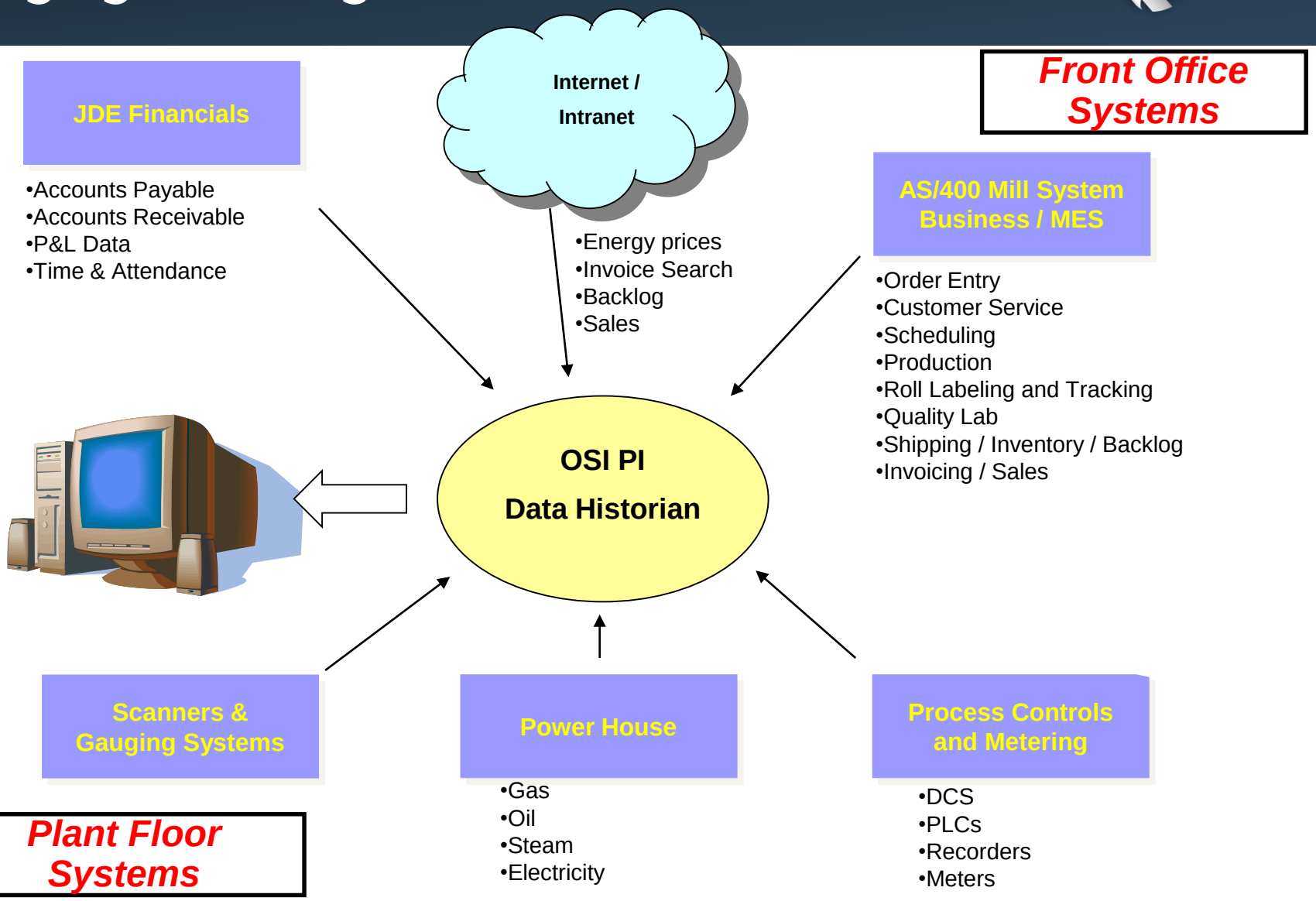
Like Magnum P.I.?



No!

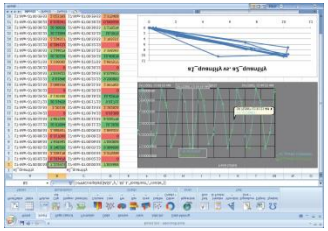
PI = Plant Information

Bringing Data Together

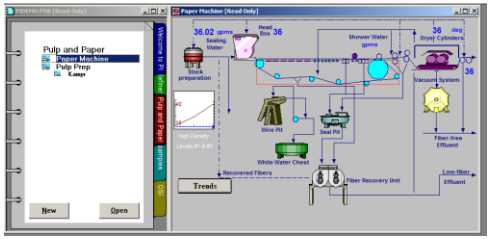


Commonly Used Features

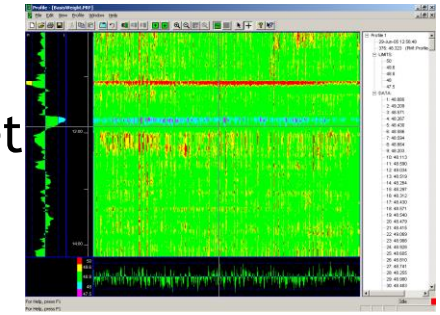
- **PI DataLink**



- **PI ProcessBook**



- **PI ProfileView** - 3D display of paperboard sheet

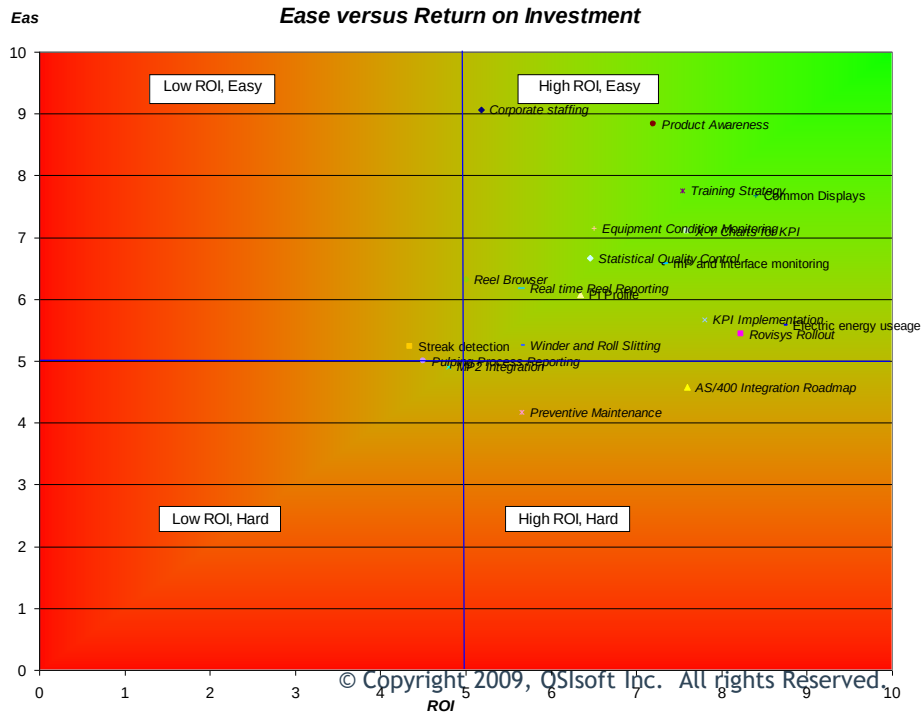


- **RtAlerts**

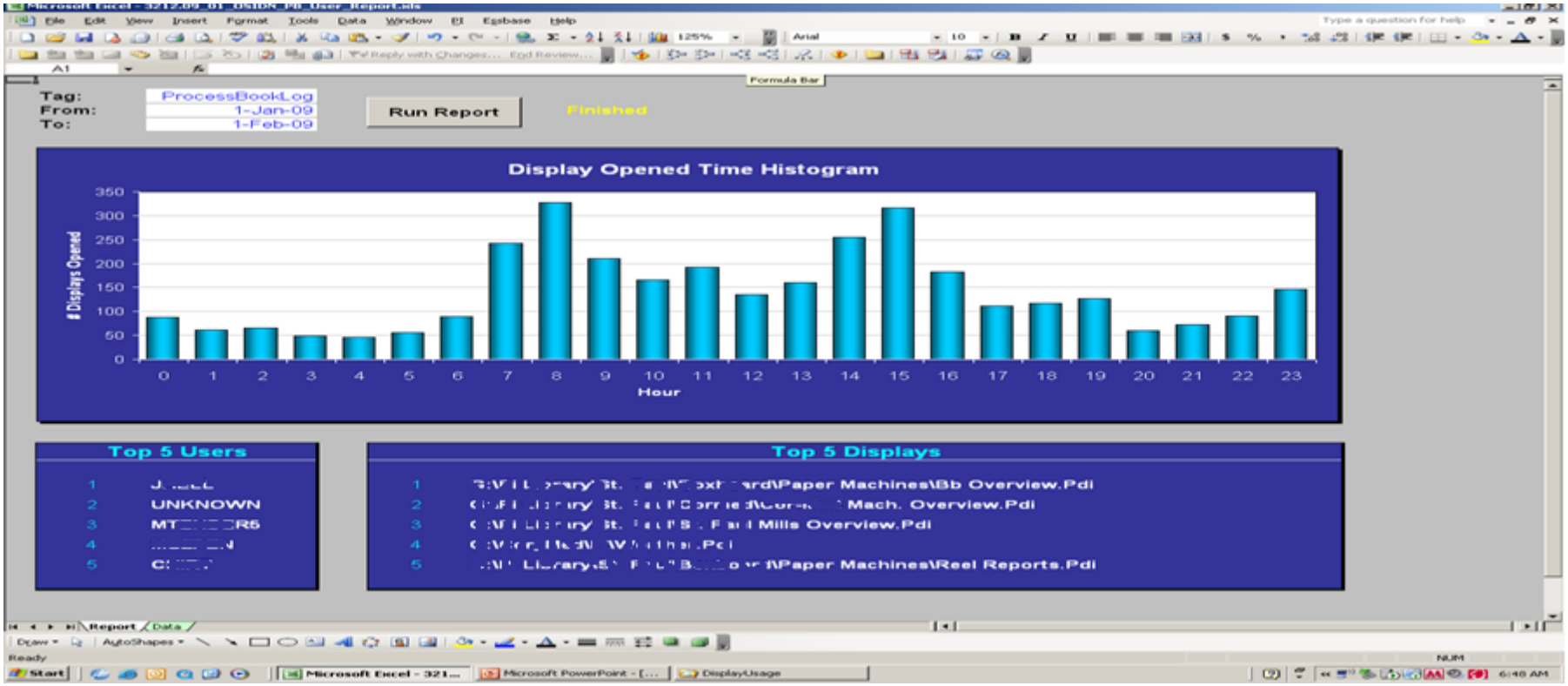
- **Transpara Visual KPIs**

Acceptance & Utilization

- Mixed mill management support
- At least one “early adopter” at each mill
- Application development driven by local needs
- Divisional priorities identified with CoE Value Realization Process (VRP)
- Requires both Subject Matter Experts and PI Experts
- Utilization?



Utilization Tool – PI-Processbook Add-in



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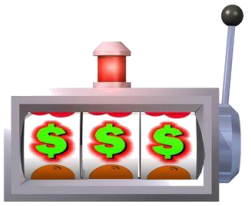
Results

- Energy Reductions > $1,000,000
- Fewer Customer Complaints
- Improved Paper Machine Efficiency
- Standardized Visualization & Benchmarking
- Six Sigma Process Capability Analysis

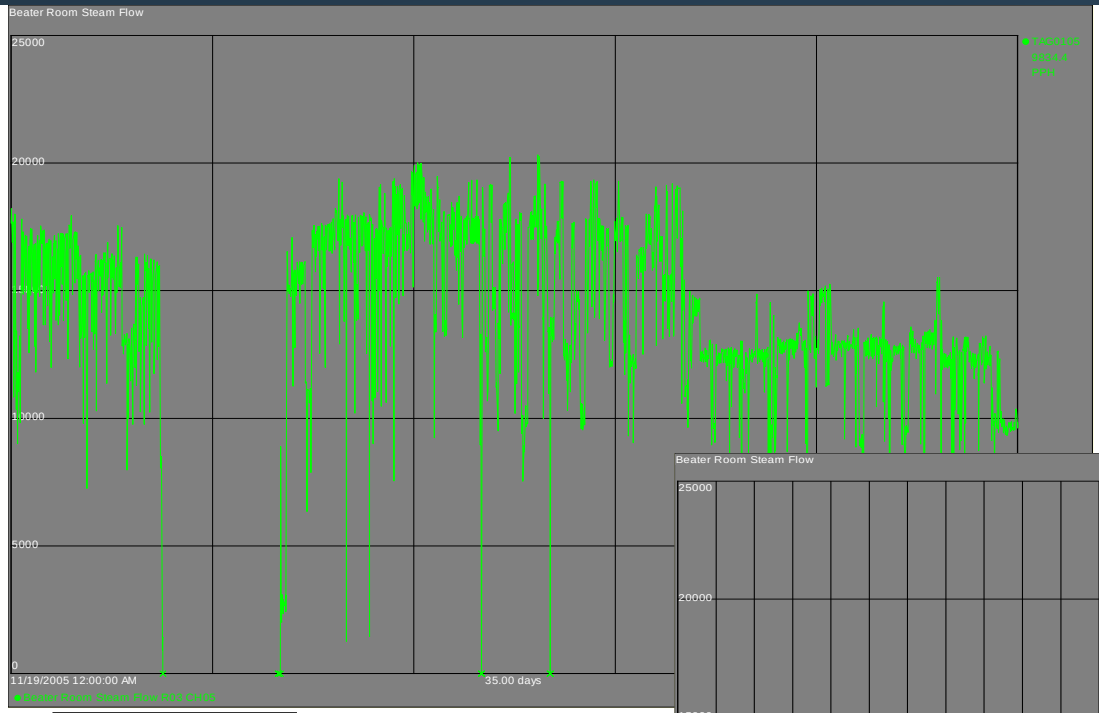
The PI Effect: Energy Reduction

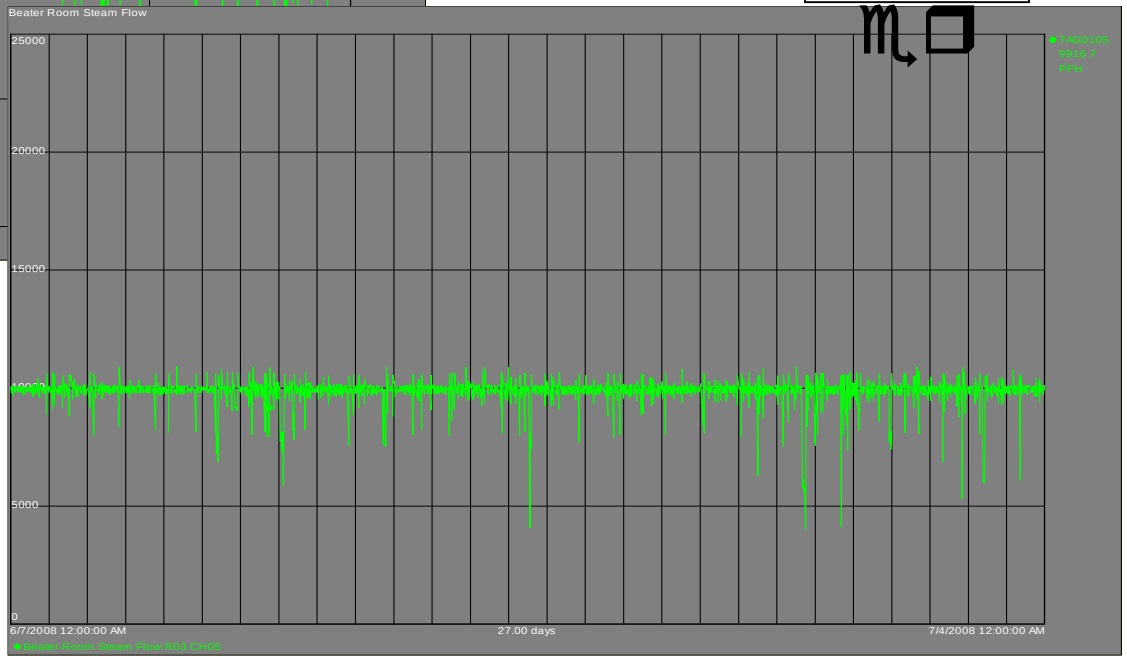
- Initial PI installation, Oct. 2005
- Began using PI trends to monitor pulper steam usage
- Made procedure changes to limit pulper steam usage
- Reduced steam usage 41%
- Reduced boiler gas consumption 23%
- Half of gas reduction attributable to pulper steam

> **$1,000,000**



Visibility of Steam Usage…





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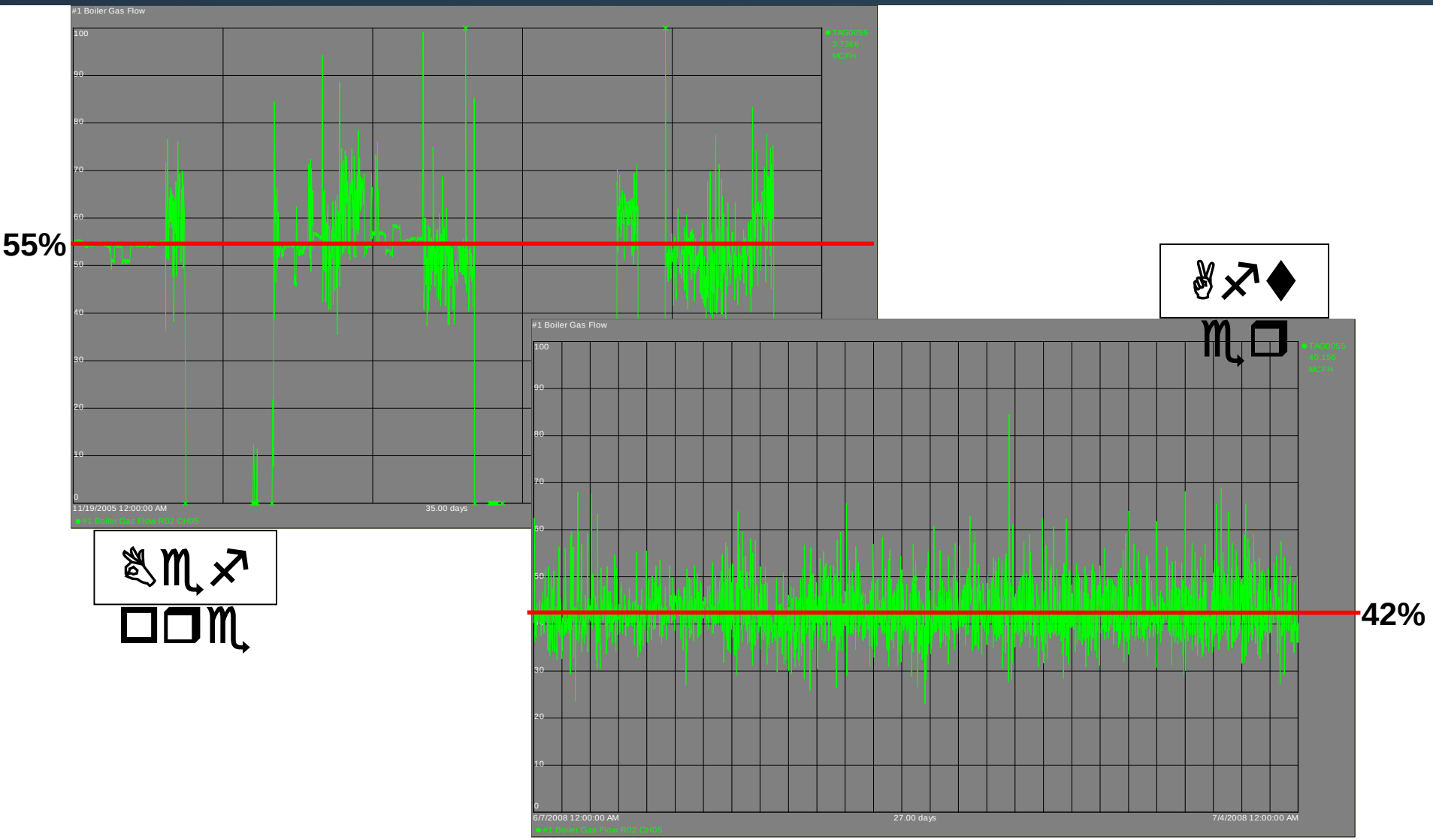
...Lowers Boiler Gas Consumption



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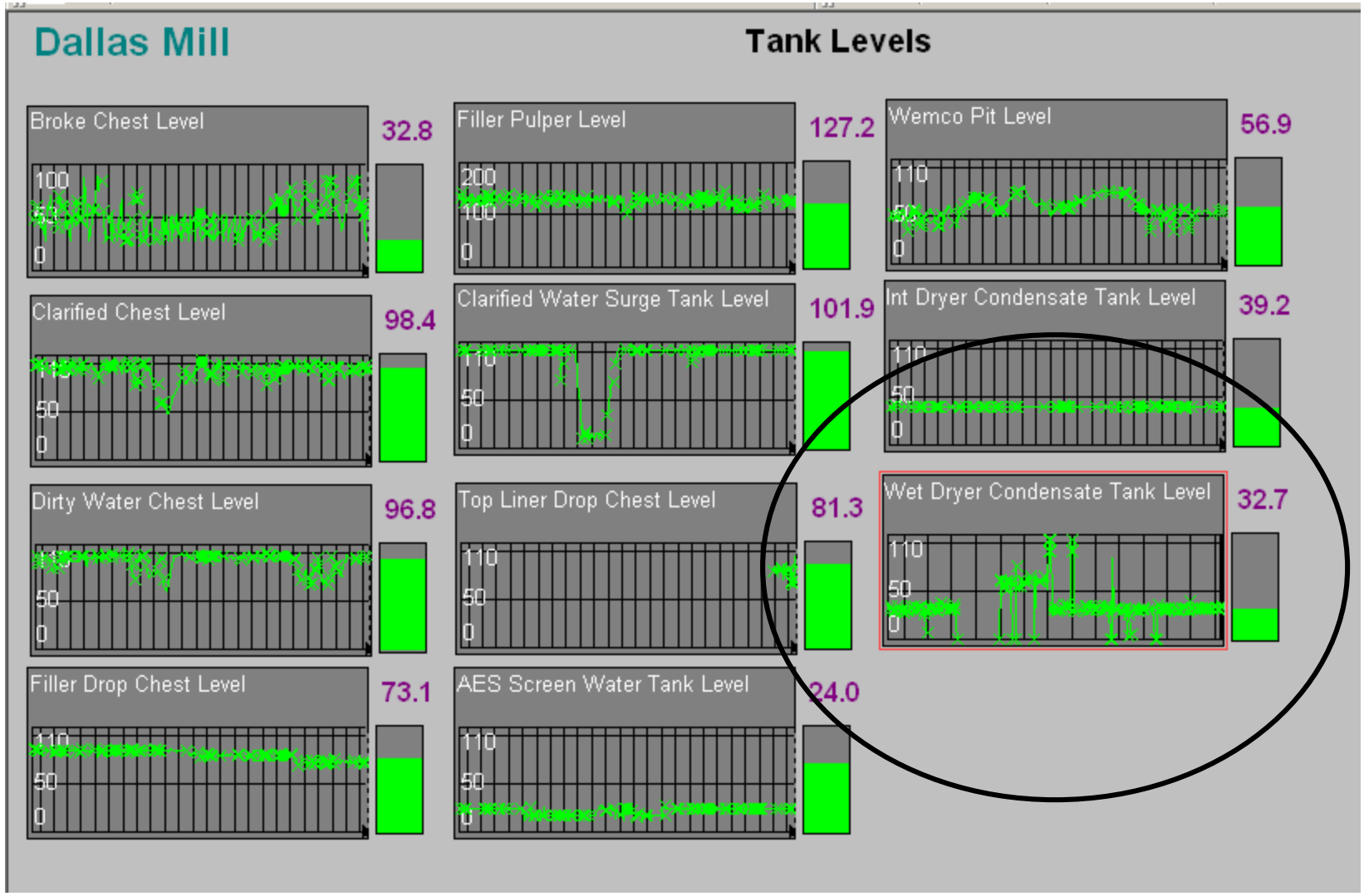
...The Fastest PI Savings



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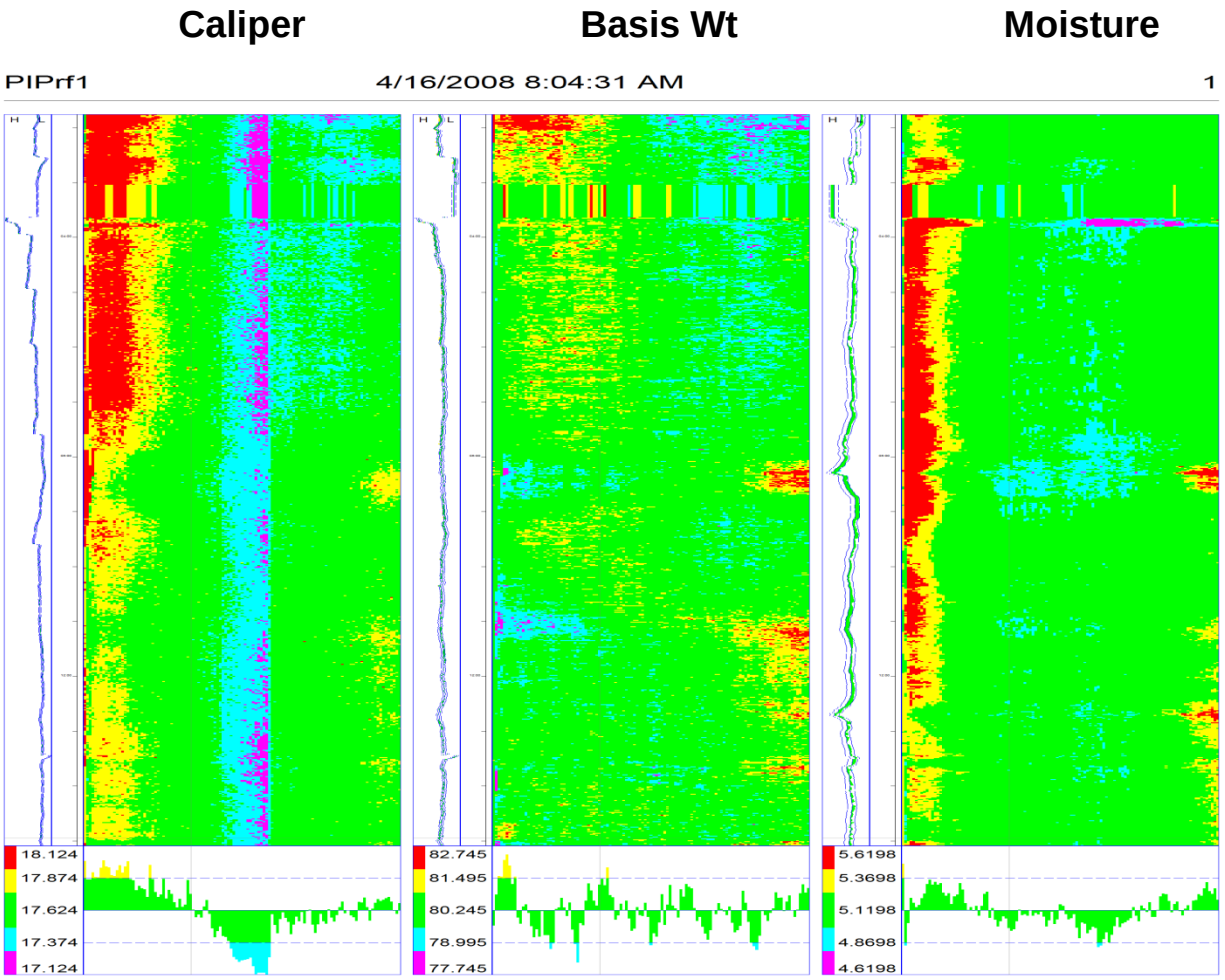
Customer Complaint Reduction

- Plant received a warp complaint
- Manually researching quality and process data was time consuming and inconclusive
- Reviewing the PI ProfileView images revealed back edge caliper and moisture streaks
- Corrective action
  - Use PI process trends and RtAlerts to notify supervisors of variances
  - Created a spreadsheet that captures all quality and process data for each reel in real-time
- Results – reduced warp complaints and claims

Plant Profile



Empowering Business in Real Time.

Paper Machine Efficiency

- PM experienced more breaks and lost time due to draw variations
- Developed a dashboard with R-Y-G indicators for tight and loose draws
- PM efficiency has improved by one percentage point
- 1% efficiency improvement equals 2.5 TPD

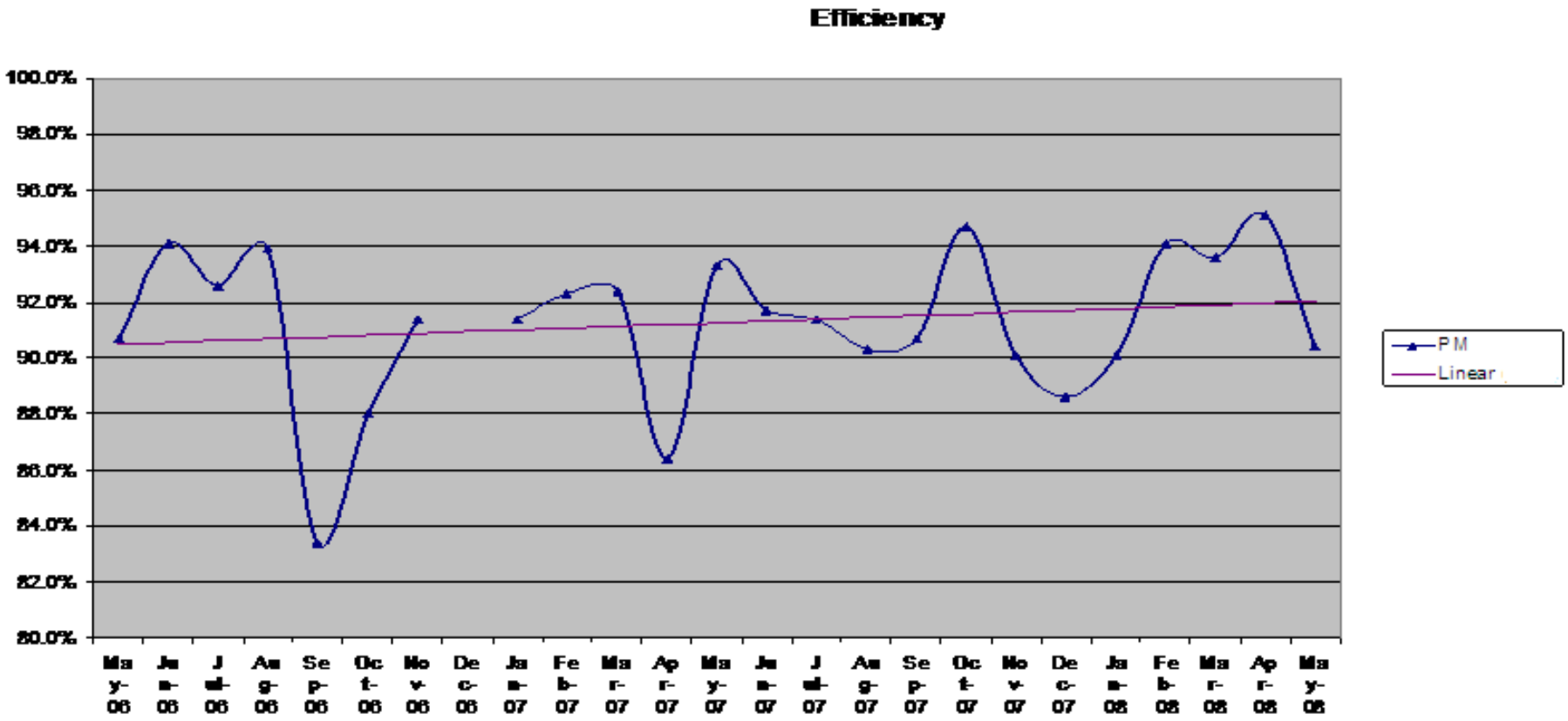
Draw Indicators

PM Speeds and Draws

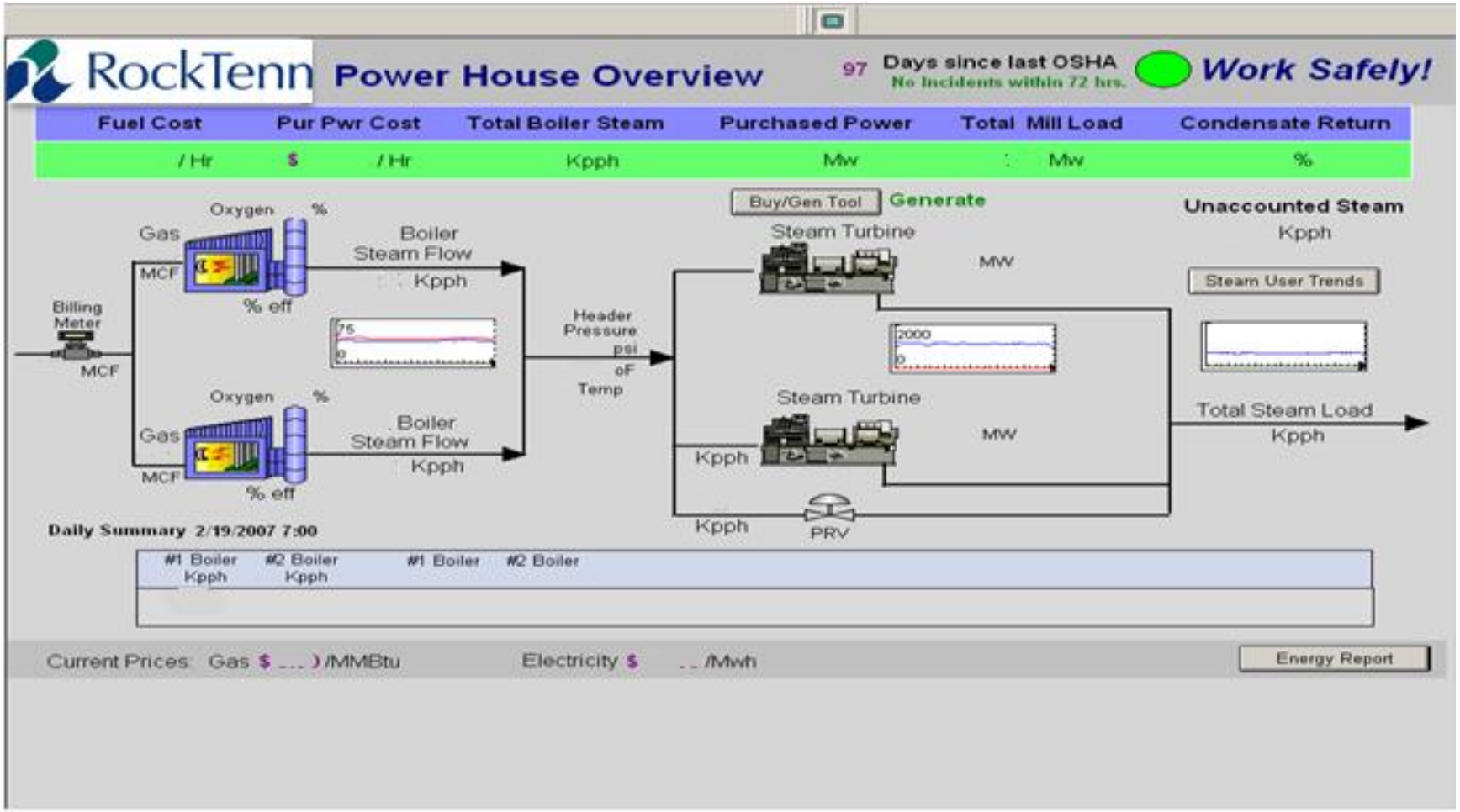
Grade

	Speed	Draw	Status
Couch	1440		
1st Press	1468	27.9	Loose
2nd Press	1486	18.2	Very Loose
1st Dryer	1500	13.5	Tight
2nd Dryer	1501	1.2	Good
3rd Dryer	1503	1.8	Loose
4th Dryer	1504	1.6	Loose
5th Dryer	1506	1.3	Good
6th Dryer	1505	-0.7	Loose
Stack	1507	2.1	Good
Reel	1505	-2.0	Good

1% Improvement in Efficiency



Standardize Displays & Benchmark



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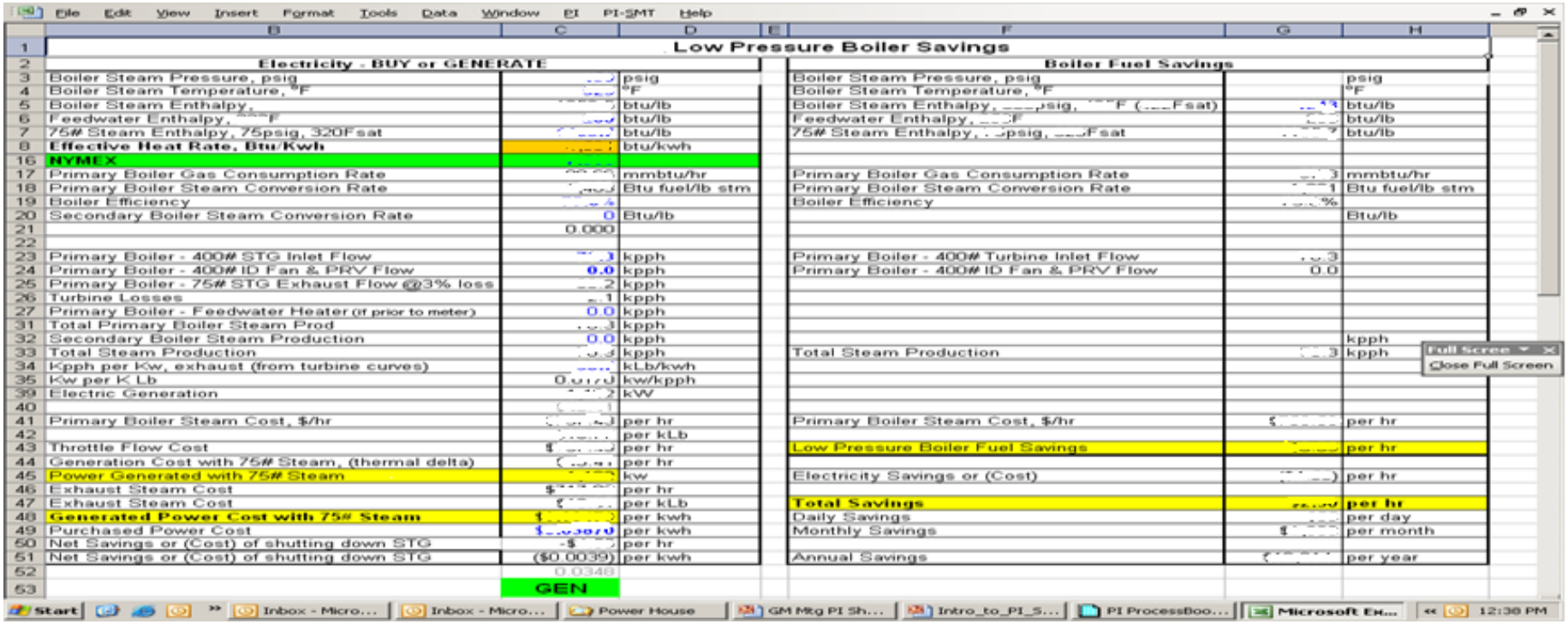
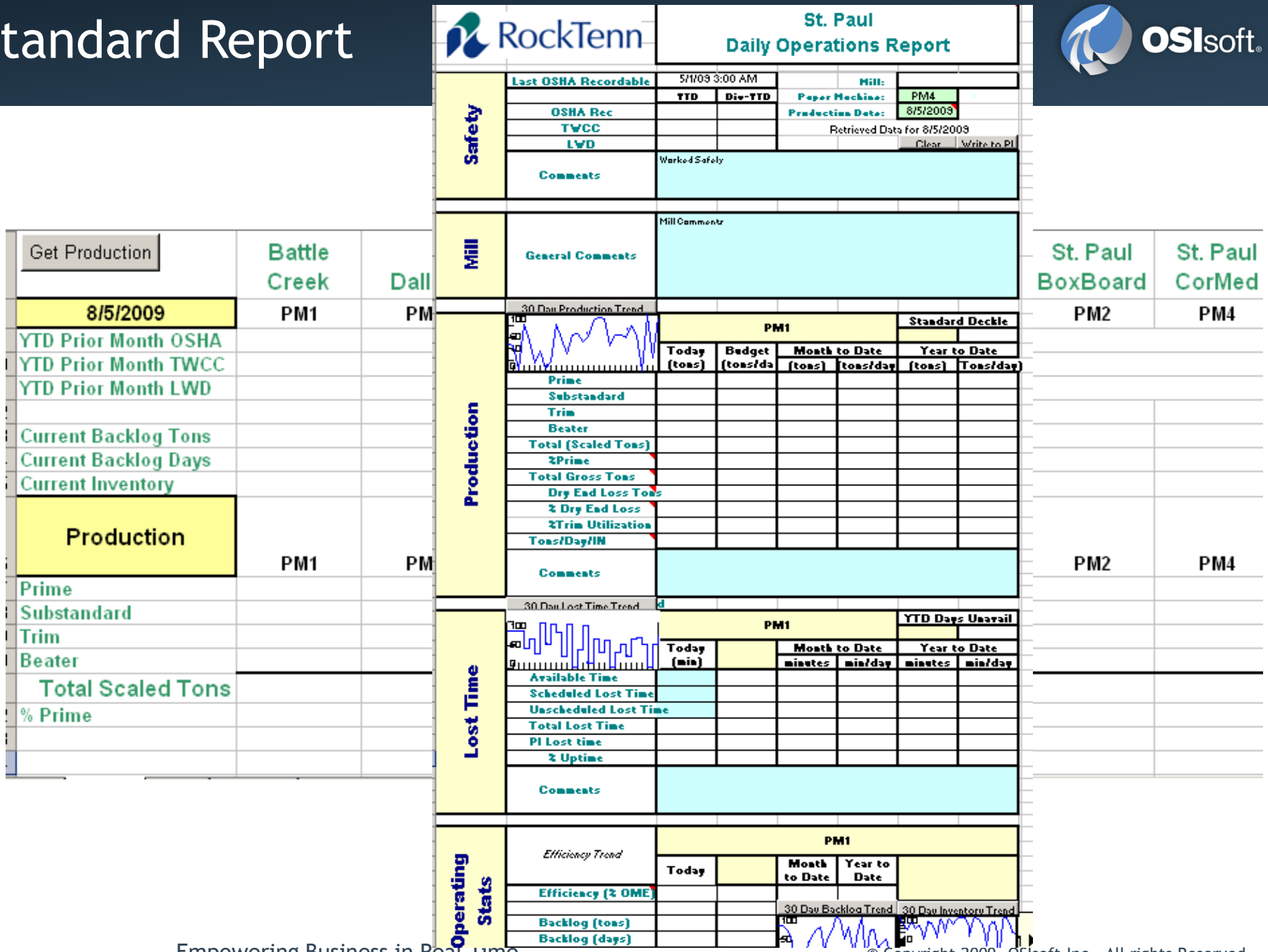
Buy / Gen Decision Tool



	B	C	D	E	F	G	H
1	**Low Pressure Boiler Savings**						
2	**Electricity - BUY or GENERATE**				**Boiler Fuel Savings**		
3	Boiler Steam Pressure, psig		psig		Boiler Steam Pressure, psig		psig
4	Boiler Steam Temperature, °F		°F		Boiler Steam Temperature, °F		°F
5	Boiler Steam Enthalpy,		btu/lb		Boiler Steam Enthalpy, ___psig, ___°F (___Fsat)		btu/lb
6	Feedwater Enthalpy, ___°F		btu/lb		Feedwater Enthalpy, ___°F		btu/lb
7	75# Steam Enthalpy, 75psig, 320Fsat		btu/lb		75# Steam Enthalpy, ___psig, ___Fsat		btu/lb
8	**Effective Heat Rate, Btu/Kwh**		btu/kwh				
16	**NYMEX**						
17	Primary Boiler Gas Consumption Rate		mmbtu/hr		Primary Boiler Gas Consumption Rate		mmbtu/hr
18	Primary Boiler Steam Conversion Rate		Btu fuel/lb stm		Primary Boiler Steam Conversion Rate		Btu fuel/lb stm
19	Boiler Efficiency				Boiler Efficiency		
20	Secondary Boiler Steam Conversion Rate	0	Btu/lb				Btu/lb
21		0.000					
22							
23	Primary Boiler - 400# STG Inlet Flow		kpph		Primary Boiler - 400# Turbine Inlet Flow		
24	Primary Boiler - 400# ID Fan & PRV Flow	0.0	kpph		Primary Boiler - 400# ID Fan & PRV Flow	0.0	
25	Primary Boiler - 75# STG Exhaust Flow @3% loss		kpph				
26	Turbine Losses		kpph				
27	Primary Boiler - Feedwater Heater (if prior to meter)	0.0	kpph				
31	Total Primary Boiler Steam Prod		kpph				
32	Secondary Boiler Steam Production	0.0	kpph				kpph
33	Total Steam Production		kpph		Total Steam Production		kpph
34	Kpph per Kw, exhaust (from turbine curves)		kLb/kwh				
35	Kw per K Lb		kw/kpph				
39	Electric Generation		kW				
40							
41	Primary Boiler Steam Cost, $/hr		per hr		Primary Boiler Steam Cost, $/hr		per hr
42			per kLb				
43	Throttle Flow Cost		per hr		Low Pressure Boiler Fuel Savings		per hr
44	Generation Cost with 75# Steam, (thermal delta)		per hr				
45	Power Generated with 75# Steam		kw		Electricity Savings or (Cost)		per hr
46	Exhaust Steam Cost		per hr				
47	Exhaust Steam Cost		per kLb		**Total Savings**		**per hr**
48	**Generated Power Cost with 75# Steam**		per kwh		Daily Savings		per day
49	Purchased Power Cost		per kwh		Monthly Savings		per month
50	Net Savings or (Cost) of shutting down STG		per hr				
51	Net Savings or (Cost) of shutting down STG	($0.0039)	per kwh		Annual Savings		per year
52		0.0348					
53		GEN					

Standard Report



RockTenn

St. Paul
Daily Operations Report

Safety
Last OSHA Recordable 5/1/09 3:00 AM
OSHA Rec | TWCC | LWD | TTD | Div-TTD
Comments: Worked Safely
Mill: | Paper Machine: PM4 | Production Date: 8/5/2009
Retrieved Data for 8/5/2009
Clear | Write to PI

Mill
General Comments: Mill Comments

Production
30 Day Production Trend
PM1 | Standard Deckle

	Today (tons)	Budget (tons/da	Month to Date (tons)	Month to Date tons/day	Year to Date (tons)	Year to Date Tons/day
Prime						
Substandard						
Trim						
Beater						
Total (Scaled Tons)						
%Prime						
Total Gross Tons						
Dry End Loss Tons						
% Dry End Loss						
%Trim Utilization						
Tons/Day/IN						

Comments

Lost Time
30 Day Lost Time Trend
PM1 | YTD Days Unavail

	Today (min)		Month to Date minutes	Month to Date min/day	Year to Date minutes	Year to Date min/day
Available Time						
Scheduled Lost Time						
Unscheduled Lost Time						
Total Lost Time						
PI Lost time						
% Uptime						

Comments

Operating Stats
Efficiency Trend
PM1

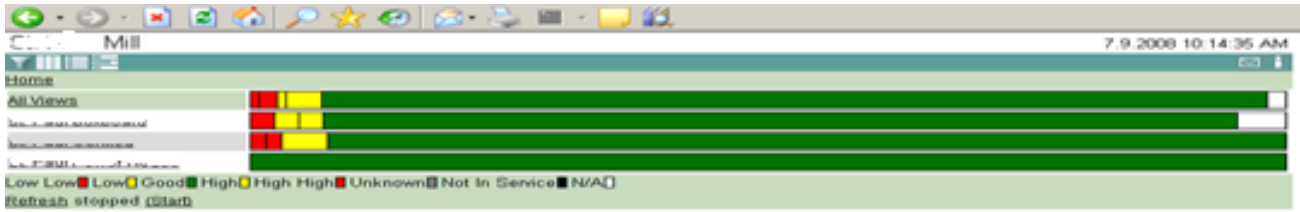
	Today		Month to Date	Year to Date
Efficiency (% OME)				
Backlog (tons)				
Backlog (days)				

30 Day Backlog Trend | 30 Day Inventory Trend

Get Production

	Battle Creek	Dall	St. Paul BoxBoard	St. Paul CorMed
8/5/2009	PM1	PM	PM2	PM4
YTD Prior Month OSHA				
YTD Prior Month TWCC				
YTD Prior Month LWD				
Current Backlog Tons				
Current Backlog Days				
Current Inventory				
Production	PM1	PM	PM2	PM4
Prime				
Substandard				
Trim				
Beater				
Total Scaled Tons				
% Prime				

Visual KPI Add On Display



Area: Beater Room											
BR Broke C 50.33	BR Broke t -1.078	BR Broke t 457.9	BR HHP Fe 1.905	BR Liner t 75	BR OCC Fe 0	BR Sewer F 125					
Area: Draws											
PM Couch 28.62	PM 1Prs 2 17.76	PM 2Prs 1 13.11	PM 1Dry 2 1.077	PM 2Dry 3 1.654	PM 3Dry 4 1.595	PM 4Dry 5 1.542	PM 5Dry 6 -.839	PM 6Dry S 1.961	PM Stk Re -1.702	PM Couch 36.08	PM 1Prs 2 40.25
PM 2Prs 1 4.167	PM 1Dry 2 2	PM 2Dry 3 2.083	PM 3Dry 4 2.917	PM 4Dry 5 1.792	PM 5Dry S 7.708	PM Stk Re 8.017					
Area: Paper Machines											
PM Break Running	PM Break Running	PM Coagul 183.1	PM Daily 0	PM Daily 39.51	PM Floccu 2.448	PM Grade 1,240	PM HHP D 312.2	PM Machin 398.1	PM1 Reel S 415.4	PM Shutdo Running	PM Steam 45,032
PM Steam 56.48	PM TPH 11.01	PM 1st Pr 23.3	PM 1st Pr 23.93	PM 1st To 11.4	PM 2nd Ma 14.16	PM 2nd To 6.776	PM 3rd To 4.228	PM Bottom 3.816	PM Break Running	PM Break Running	PM Coagul 183.9
PM Daily 0	PM Daily 44.72	PM Drum 25.41	PM Floccu 2.964	PM Grade 1,200	PM Machin 405	PM OCC D 332	PM Reel S 440.3	PM Shutdo Running	PM Steam 44,791	PM Steam 46.05	PM TPH 12.45
PM Aquatr 45	PM Break Running	PM BW Re .285	PM Couch 1,440	PM DW Re .157	PM Main D 33.96	PM Main S 291.7	PM Mois C .609	PM Mois M .196	PM Pond L 11.99	PM Prod. 11.19	PM Reel M 8.5
PM Reel S 1,506	PM Rush D -21.52	PM Shutdo Running	PM Steam 38,230	PM Thicks 3.93	PM Tickle 504.9	PM Aquatr 25	PM Break Running	PM BW Re .116	PM Couch .534	PM Couch 1,535	PM Day Ti Running
PM DW Re .294	PM Mach. 4.203	PM Main D 57.03	PM Mois C .403	PM Mois M .242	PM Pond L 12.59	PM Prod. 12.61	PM Reel S 1,640	PM Rush D -22.39	PM Shutdo Running	PM Steam 19,080	PM Steam 6.05
PM5 Tickle 450.1											
Area: Power House											
PH #2 Opac 10.69	PH #2 Boil 82.64	PH #3 Opac -.339	PH #3 Boil 103.1	PH Total S 185.7							
Area: Stock Prep											
SP #4 Barr 3.899	SP #4 Brok 197.6	SP #4 Ref. 4.365	SP #5 Barr 3.629	SP #5 Ref. 3.796	SP 4-2 Ref -1.016	SP 4-3 Ref 700.7	SP 5-1 Ref 546.8	SP 5-2 Ref 540.6	SP CM Sew 142	SP PB Ches 3.255	

Power Users

- Monthly conference calls
- Semi-annual face-to-face meetings
- SharePoint portal for collaboration & information
- Share and leverage applications across all mills
- Discuss standards and naming conventions
- Learn new tools and software
- Create RtAlerts
- CoE involved in many of the above items

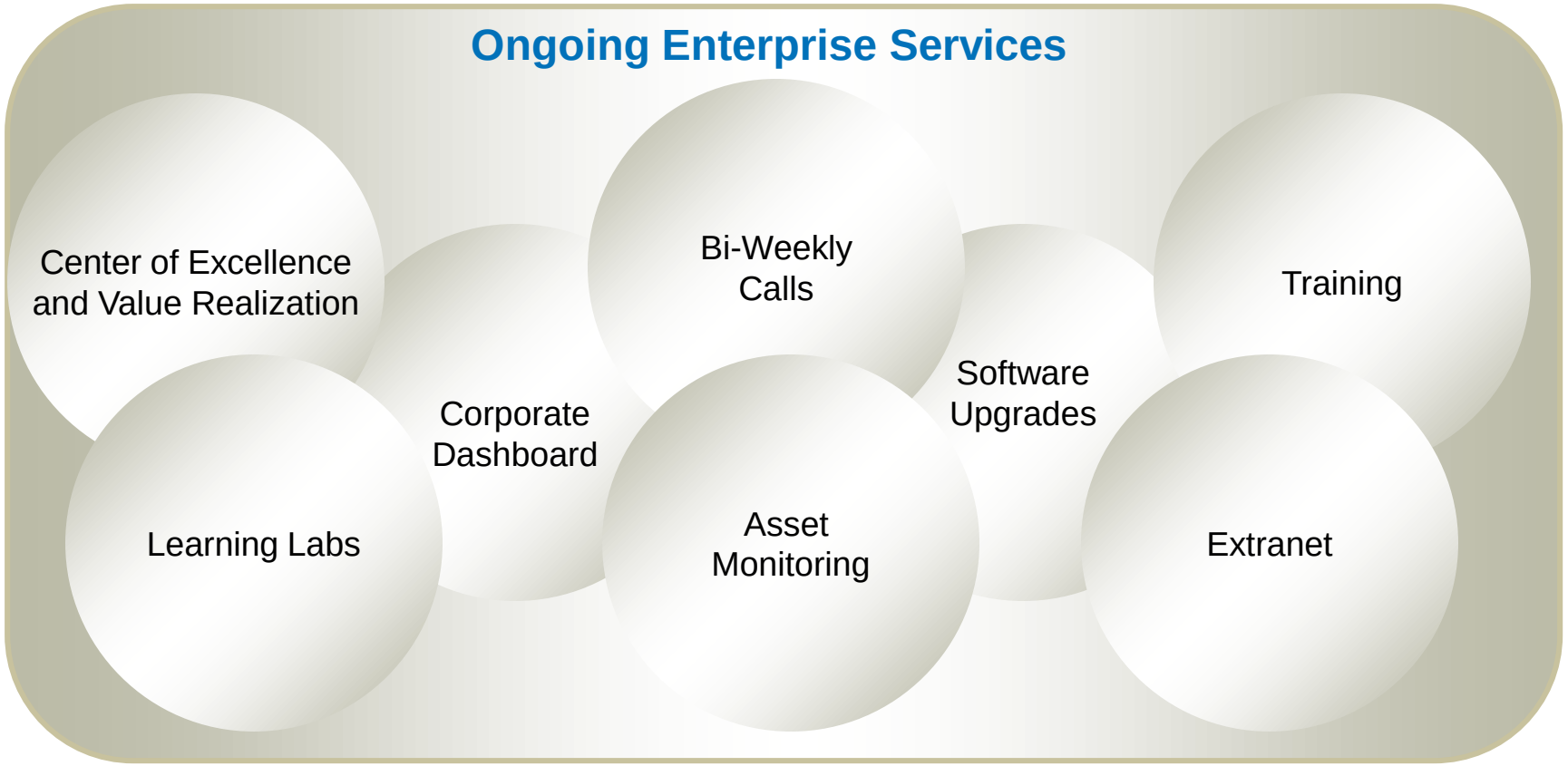
Lessons Learned

- Planning vs. Speed – It's a tradeoff

- Engage IT in project planning

Value Later with Enterprise Services

Next Steps:



Empowering Business in Real Time.

Thank you

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