Routine Process Monitoring Using PI WebParts to Build the Perfect Dashboard

Presented by

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Agenda

- Corporate Vision for PI WebParts
  - Installed Base
  - Benchmarking
  - Routine Process Monitoring
- Examples and Benefits
  - Filling Operation
  - Water Distillation
  - Coating Operation

About Lilly

- Large Pharmaceutical Manufacturer
- Founded 1876 (135 year heritage)
- ~23 B$ Net Sales (2010)
- ~38,000 employees worldwide with ~ 7,500 in R&D
- Manufacturing plants located in 13 countries
- Clinical research conducted in more than 50 countries
- Research and development facilities located in 9 countries
- Products marketed in 143 countries
- www.lilly.com

Background – Our vision for PI WebParts

- Installed Base
  - 13 Lilly Manufacturing Sites have the PI System
  - 2 PI WebParts Servers (S95 Level 4 System)
  - PI ACE
- Benchmarking
  - Between sites
  - External
- Routine Process Monitoring

Background – Internal Benchmarking

- Replicate
  - Between sites with similar processes
  - Use concepts from other sites to create new displays
- Forums to share successes
  - Monthly – Regional Focus
  - Quarterly – Corporate Focus

Background – External Benchmarking

- Working Sessions
  - Exercise in MI&CS Leadership Global Meeting
  - AMR Research Workshop in Boston
  - Cisco Discussions in Indy
  - Microsoft in Chicago
  - Microsoft in Redmond
- Consultation with key partners
  - Rockwell, OSIsoft
  - Brokered by Microsoft Manufacturing Consultant – Enrique Herrera

Background - Findings

- Future manufacturing operations will employ new technologies but will still rely on people
- “Right information in the hands of the Right People at the Right time” still holds true but it will expand to include “On Any Device”
- Productivity outside of the manufacturing plant walls will increase due to mobile devices, enhanced alert mechanisms and improved data visualizations on a multitude of applications.

Background - Findings

- Internal/External collaboration and language barriers will be reduced by technology
- Social media will become an expected norm for communication between people and between people and the equipment
- Virtual worlds /simulation environments will generate business benefits in areas ranging from training to modeling of production lines to facilitating global meetings, and data immersion

Business Value arises when technology…

- Increases efficiency (eliminates waste of time, material & effort)
- Accelerates trajectory between “data acquisition” to “analysis” to “decision”
- Magnifies individual knowledge and expertise
- Improves the alignment of individual performance with the strategic/tactical goals.

Potential “Levers”

- Data Data Data Data (Available, Pervasive, and Comprehensive)
- Analysis, Analysis, Analysis, Analysis (Data is only valuable if it creates knowledge)
- Increasing power and availability of mobile devices
- Increasing power and flexibility of communication and collaboration tools.
- Tasks consolidated in “Personalized” context but prioritized in “Business” context. (Business Process Management and Workflow.)

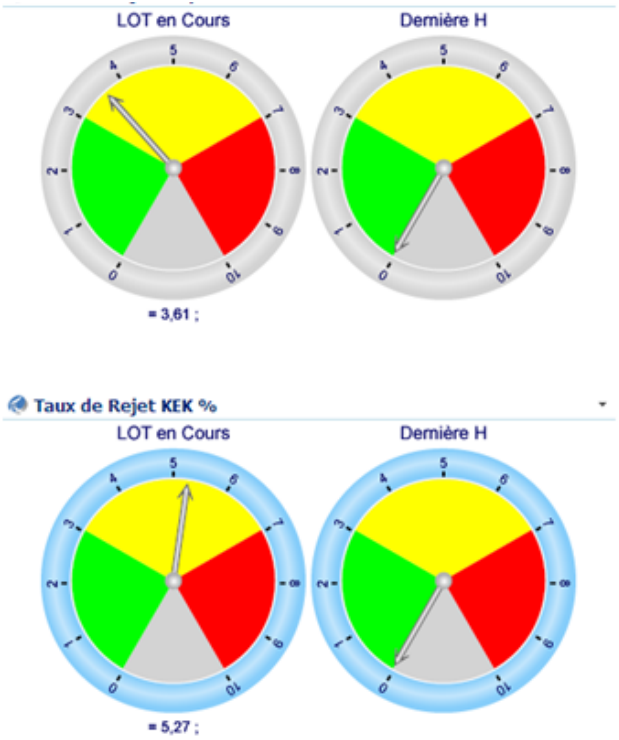
Routine Process Monitoring

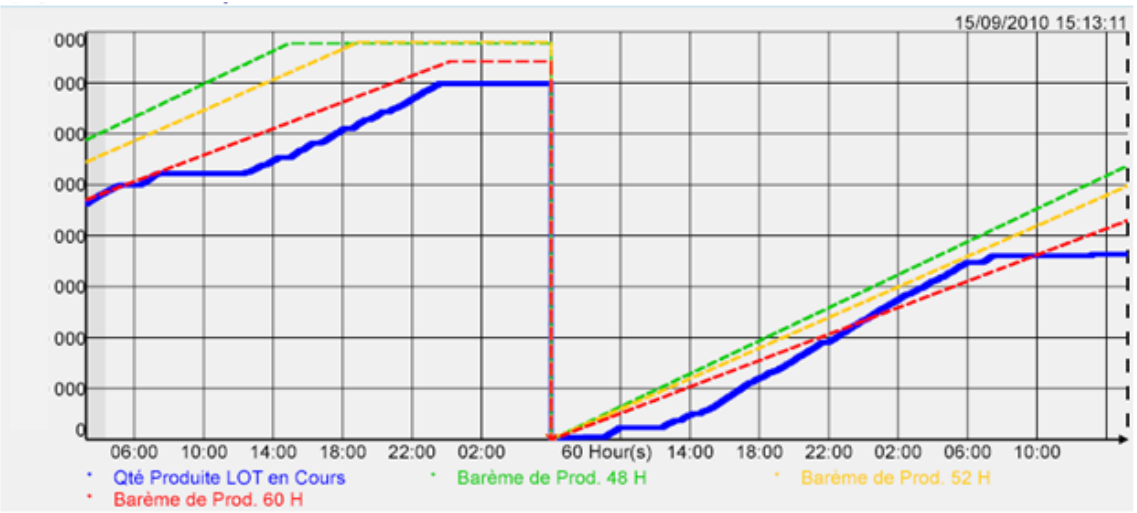
- Timely monitoring of standard/pre-defined trend plots of "key/important" parameters (timely = during or post-run)
- Timely review of process/product end-of-batch/cycle reports (including any alarms)
- Analysis of key batch-to-batch parameters (e.g. batch SPC)
- Review of multiple batch trends/overlays which could/should include evaluation against 'golden batch' profile limits.
- Equipment performance monitoring - cycle time, downtime monitoring/ analysis, condition-based maintenance

Business Objectives

- Increase effectiveness using Routine Process Monitoring
- Closely monitor and control the Manufacturing Process
- Anticipate problems
- Simplify and increase reliability

Solution – Filling Operation Dashboard





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Somme des Arrêts LOT en cours (Heures)

TOP5 défauts LOT en cours et Nb d'Occur.	
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121-DEF.POS.AIG.2ème JET | Def0121.REM8600A	6
119-DEF.POS.AIG.1er GROUPE | Def0119.REM8600A	4
188-CONTROLE ENTREE KEK | ddZSH9900D.MIR9900	3
226-POS.CARP.TROP BAS/HAUT | dZSL8618C_D.REM8600A	3

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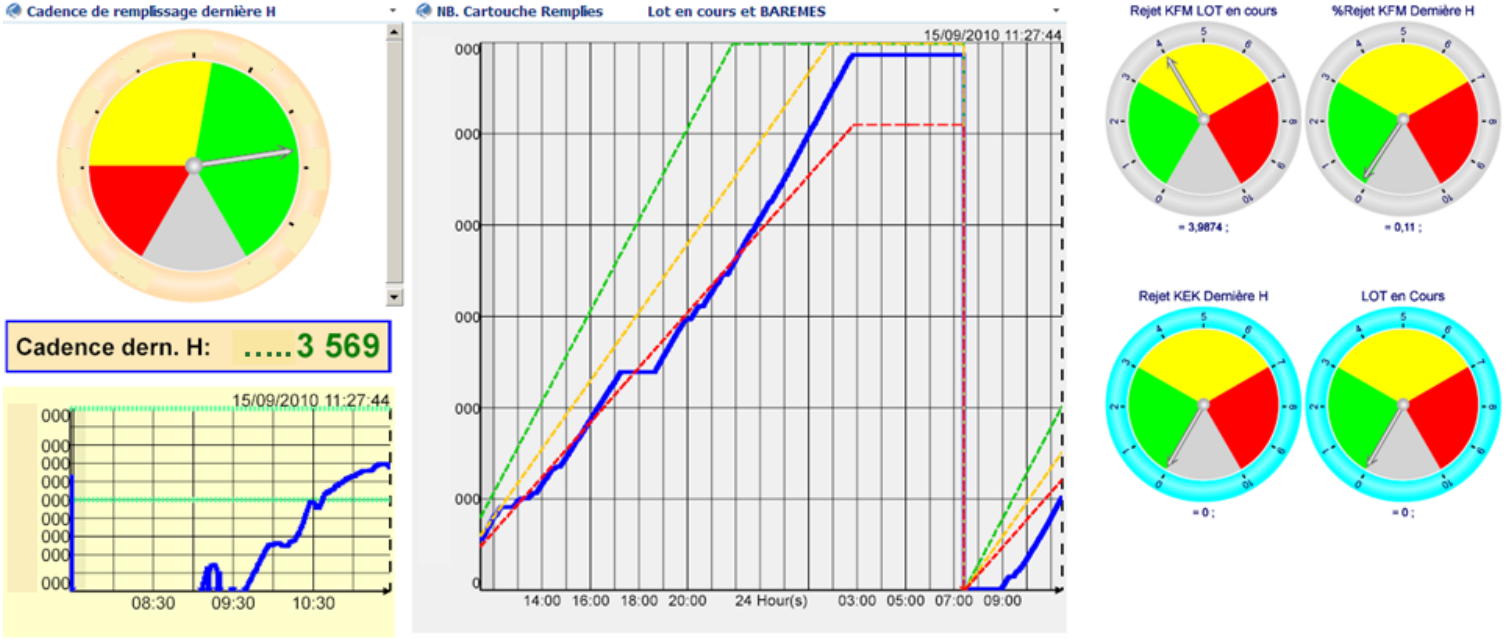
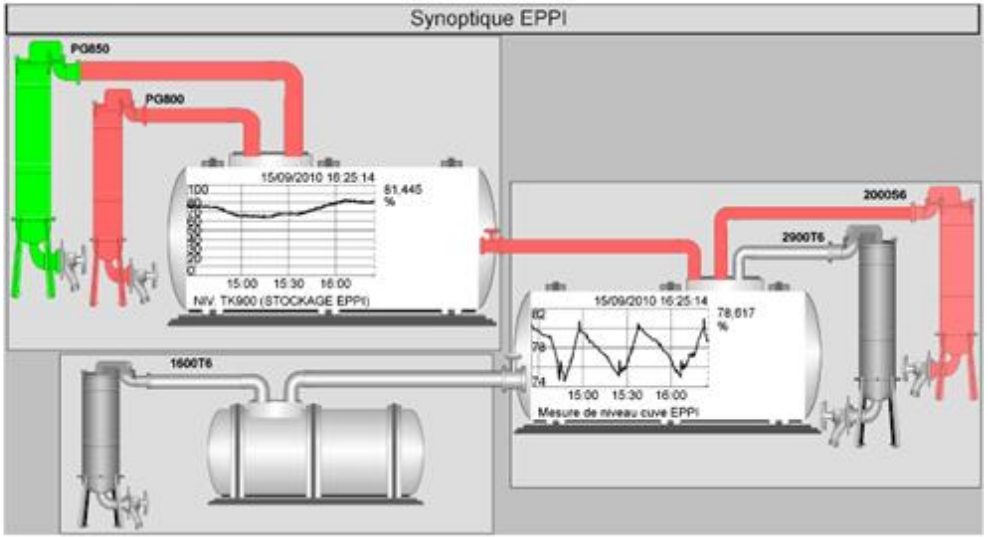
Maintenance Tech Dashboard



Benefits

- Site Productivity increase, however hard to quantify
- Users find it easy to browse for information
- Helps develop “data culture”
- Helps make decisions

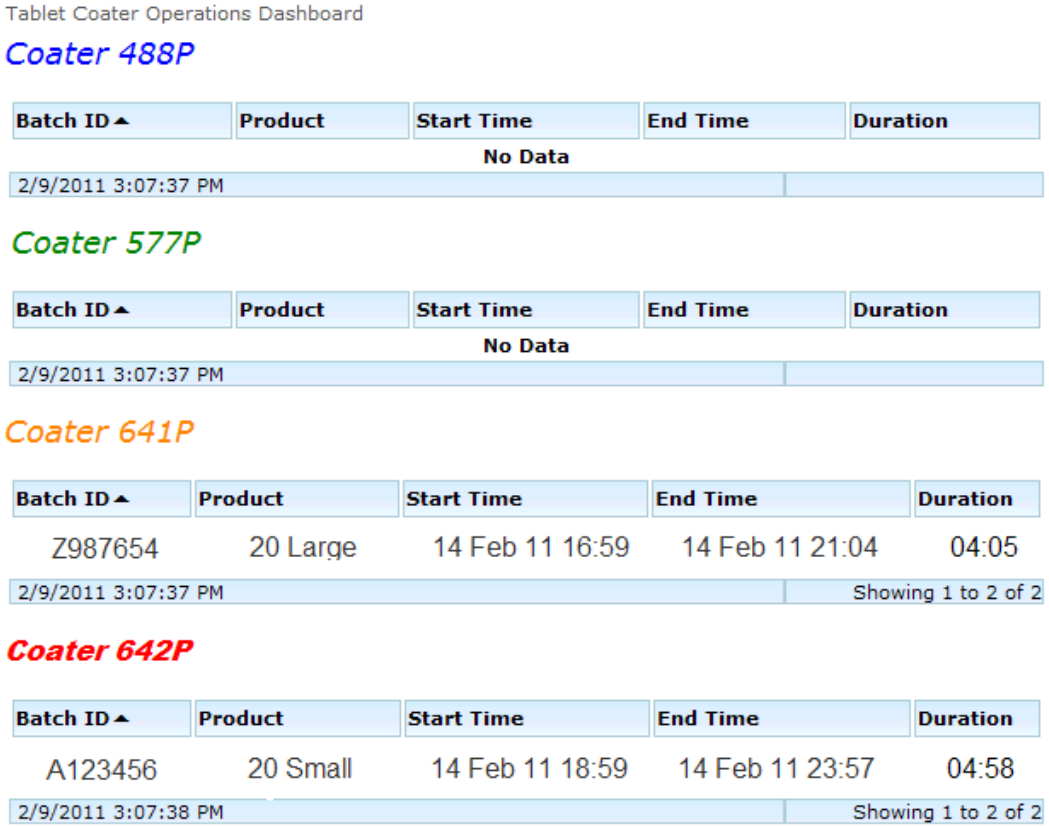
Distilled Water Processes



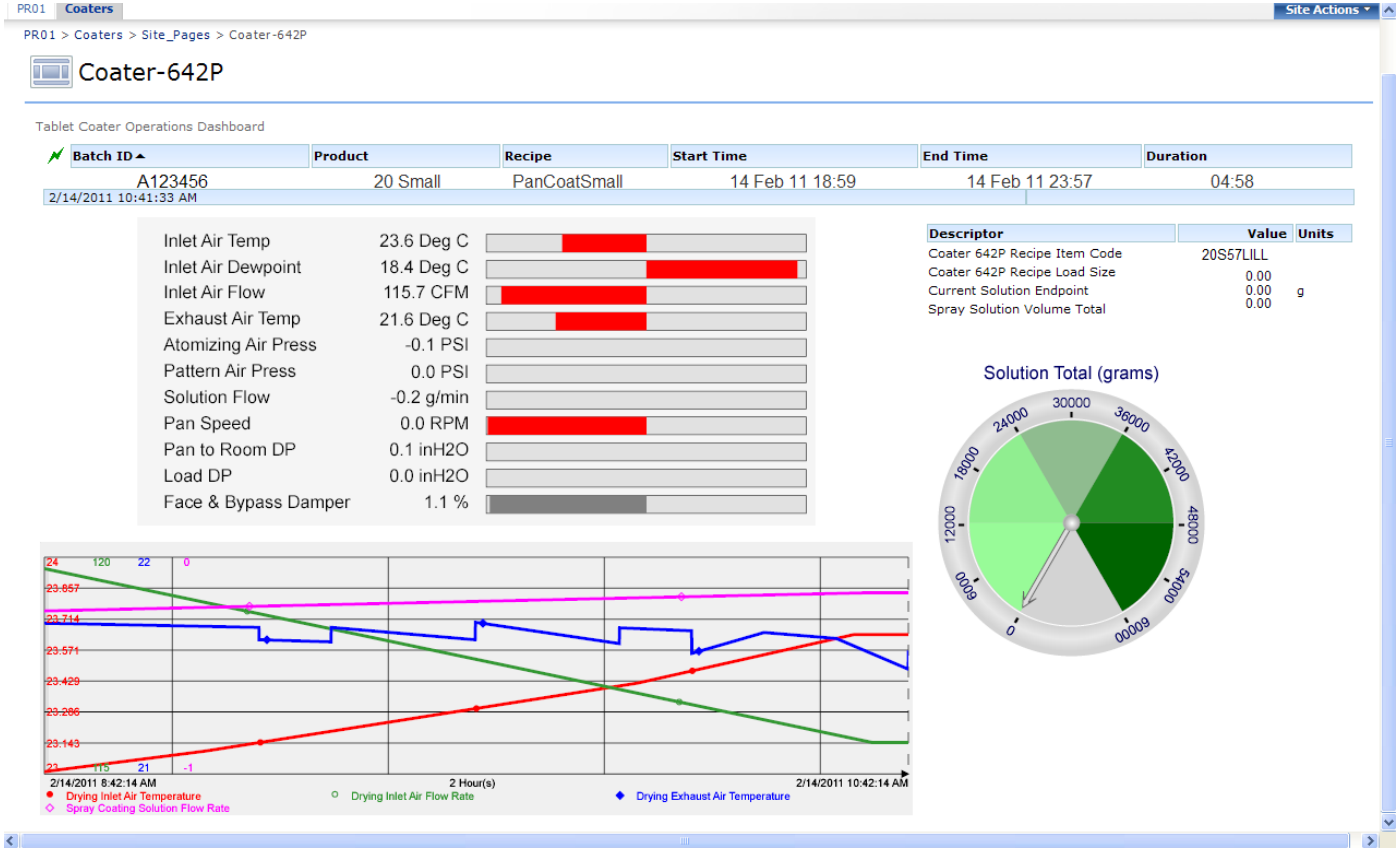
Benefits

- Significant decrease in WFI losses over 2 years (-70%)
- High Annual $$$,$$$ savings for a small investment
  - Natural Gas saved results in reduced CO2 emissions by 500 Tons/year
  - Electrical power reduced by 400 MWH/year
  - City water use reduced by Mgal/year
- PI ACE: Losses, equipment usage, production etc. are calculated in real time
- Monitoring is done real time and over 2 years

Tablet Coater Operations Dashboard



Tablet Coater Operations Dashboard



Benefits

- Site Productivity increase, again this is hard to quantify
- Less gowning to enter clean room to monitor machine
- Helps develop “data culture”
- Helps make decisions

Questions

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Thank you