



Accessible Information for Manufacturing with the PI System

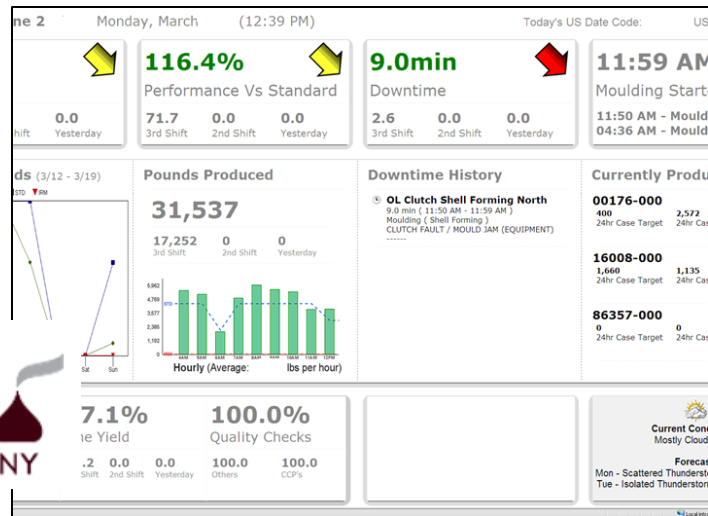
Presented by

Russ Gregg
Sr. Project Manager/Manufacturing Information Services
The Hershey Company





AIM – Accessible Information for Manufacturing provides Hershey plants with real-time information to drive proactive manufacturing execution.



Business Challenges

- A. Reduce manufacturing cost.
- B. Drive proactive execution of best practices.
- C. Accelerate the rate of continuous improvement.
- D. Improve quality and reduce the cost of compliance.

Solution

- A. Deployed open, flexible and scalable platforms.
- B. Focus on facilitating operator task execution and issue response.
- C. Created graphical easy to use role based solutions.

Results and Benefits

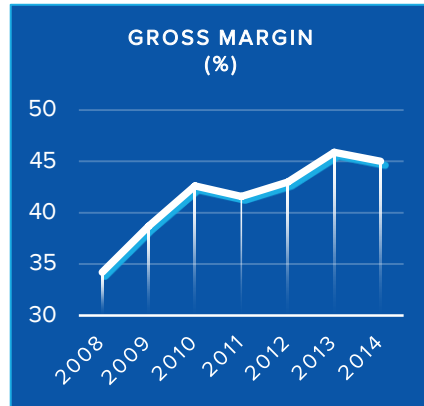
- Paperless manufacturing management.
- Breakdown & maintenance repairs down 33%.
- Speed & throughput losses down 30%
- Quality losses down 22%

The Hershey Company

- Leading manufacturer of chocolate, candy, gum, mints and snacks.
- Rapidly expanding our brands across global markets.
- Over \$7.4 billion in annual revenue – across over 7,000 SKUs.
- Over 21,000 employees



Growing through global expansion and strategic business acquisitions.



Hershey Legacy - Doing well by doing good!

Year	Event
1894	Milton S. Hershey establishes the Hershey company.
1905	The Hershey Chocolate factory begins operations and the Hershey Trust Company is established.



💡 120 years of “Doing well by doing good!”

1918	Milton transfers the bulk of his wealth to the Hershey Trust Fund to benefit children in need.
Today	The Milton Hershey School is a coed boarding school benefiting over 2,000 students from pre-K through High School.



Leader in Corporate Social Responsibility

- 2014 Responsible COE of the Year Corporate Responsibility Magazine
- 2015 Most Ethical Companies - Ethisphere Institute.



Doing well by doing good is just good business!

and Learn to Grow to enable our 21st Century Cocoa Sustainability Strategy

- Committed to sourcing 100 % sustainable cocoa by 2020.
- Committed to sourcing 100 % traceable palm oil by 2015.
- Project Peanut Butter in Ghana. Building a plant and leading the effort to produce peanut based food sustenance bars for children to help over come malnutrition.



21st Century Global Supply Chain Challenges

Rapid



Information will be the key to overcoming supply chain challenges!

Change



Manufacturing Information Technology Investments

“Best in class manufacturers are:

- 52% more likely to utilize MES.



Information investments are the key to driving desired outcomes!

57% more likely to provide the data to the necessary job roles for effective decision making.”

- 77% utilize automated data collection for inventory, production and quality.

Aberdeen Group

Manufacturing Visibility

Results of an IBM survey of over 400 supply chain executives in over 25 countries and 29 industries.



Real time visibility drives faster and better decisions!

their operations on the ground-level or on the production floor in real time, and this lack of insight **hampers their ability** to make the **right decisions at the right time.**”

IBM - Driving operational excellence with predictive analytics

What is a “Real-Time Enterprise” ?

“The Real-Time Enterprise monitors, captures and analyzes root-cause and overt events that are critical to its success the instant those events occur.”



The PI System is a key enabler of the Real-Time Enterprise!




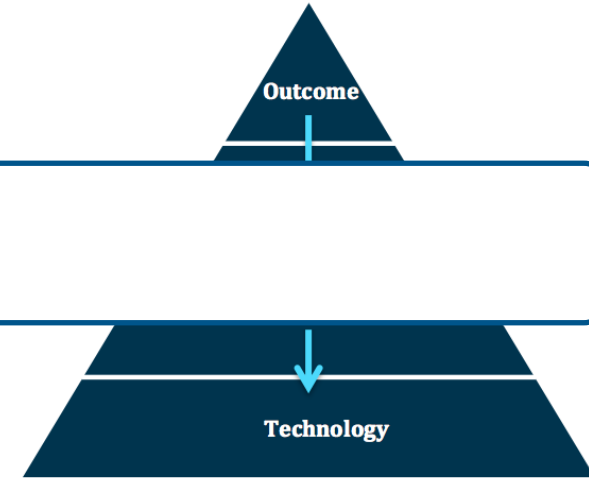
The Real-Time Enterprise will then exploit that information to progressively remove delays in the management and execution of its critical business processes.”



Gartner

Hershey Business Drivers

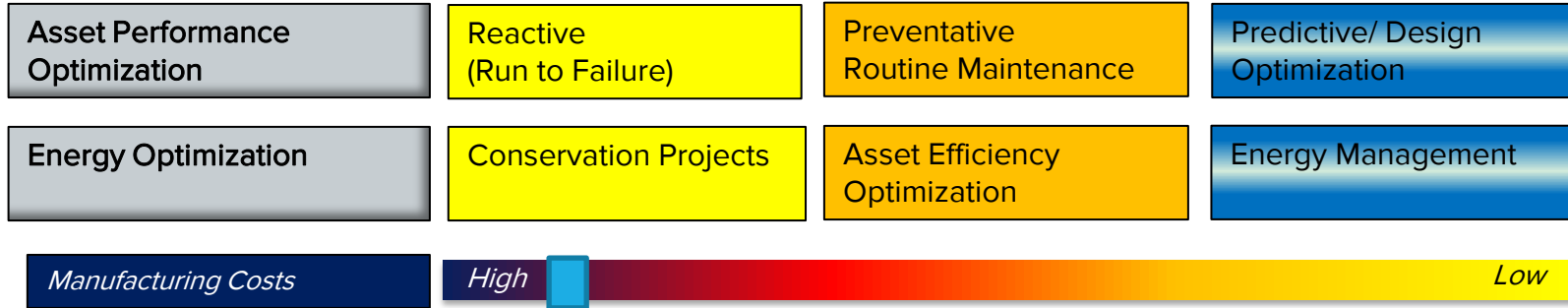
- Drive **manufacturing cost reduction** through improved quality, efficiency, productivity and asset utilization.
- Drive **proactive operator engagement** to achieve
-  **Start with the final outcome in mind!**
- **manufacturing visibility and guided production execution.**
- Drive **improve quality & regulatory conformance** while reducing the cost of compliance.



Enable Strategic Execution



Clearly align information technology investments with business strategies!



Engage Key Stake Holders

R&D

- Product Variety
- Rapid Scale Up
- Process Understanding

Cost Accounting

- Lean Accounting
- Actual Costs
- lbs./Btu

Lean/6-Sigma

- Waste Reduction
- Variability Reduction
- Process Optimization

Quality & Regulatory Control



Supply Chain



Engage stake holders to really understand needs and opportunities!

Information Services

- Security
- Reliability
- Service Costs



Engineering

- ROCE
- Reliability
- Efficiency-Energy

Marketing

- Consumer Satisfaction
- Promotions
- First to Market

Asset Reliability

- ROCE
- Reliability
- Efficiency-Energy

Finance

- Budgeting
- Cash Management
- Cost Containment

Establish Design Principles

- Deploy **easy to use** applications that deliver **targeted information** to key users to drive **proactive actions** and generate **bottom line results**.
- Invest in **highly flexible** and **scalable platforms** that enable **open sharing of information** across the entire

 **Understand your guiding principles and stick to them!**



Overcome Technical Challenges

System Variety

- Multiple solutions deployed to meet MES and control requirements.



Use the power of the PI System to overcome technical challenges!



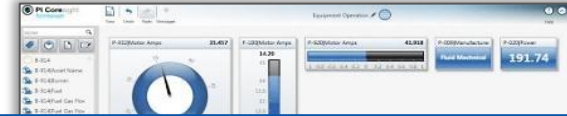
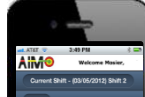
User Variety

- Workforce with varying knowledge, skills and abilities.
- Large diverse set of stake holders.

Security Risks

- Limited Industrial Controls Network infrastructure.
- Increasing convergence of enterprise and control networks.

Hershey's Architectural Solution



Manufacturing

We

Asset

Minimize application and integration touch points!

MII Pco Agents



MES

- PM-Plant Maintenance.
- PP-Production Planning
- WM-Warehouse Mgmt.

- Bar Coding/Labeling
- Product Tracking
- Production Mgmt.
- Material Mgmt.
- SPC

SCADA

- Multiple Vendors
- Multiple Versions
- Multiple Platforms

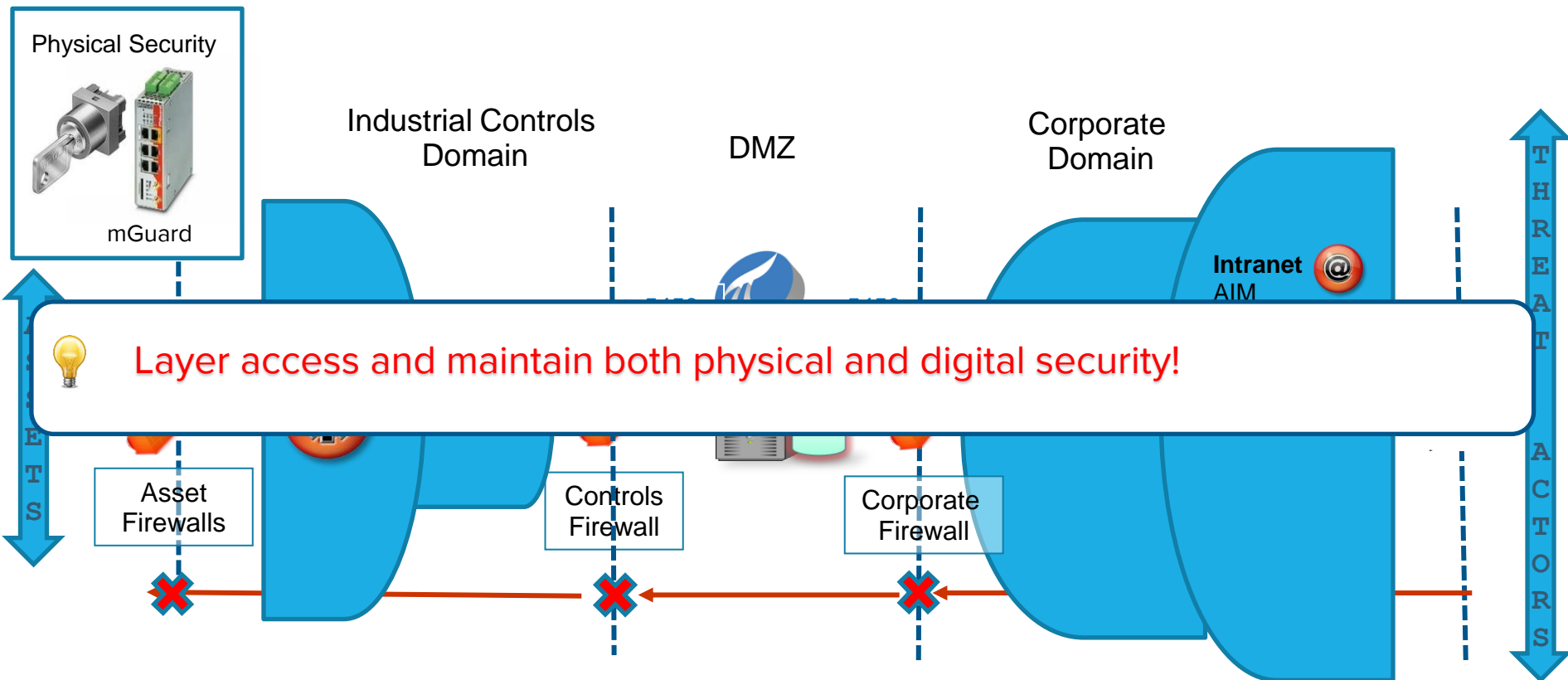
Controls

- Multiple Vendors
- Multiple Products
- Multiple Vintages

Devices

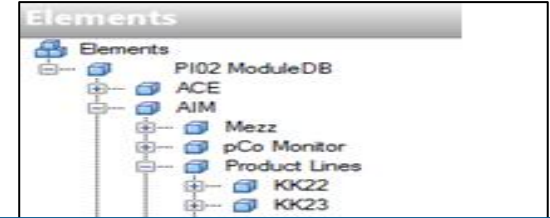
- Instrumentation
- Metal Detectors
- X-Ray
- Scales
- Vision Systems

Hershey's Security Solution



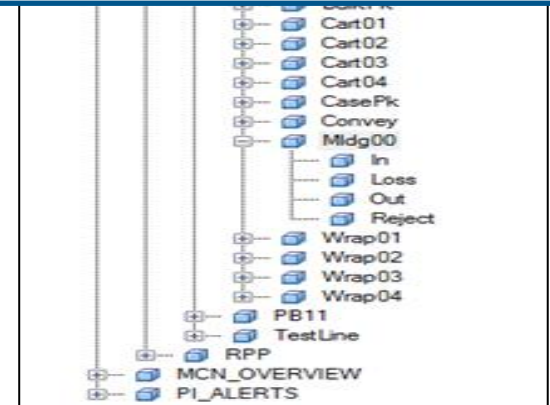
Structure Data – Asset Framework (AF) Asset Models

- Provides flexible hierarchical structures with **reusable** object templates.
- Enables the **standardization** of applications and reporting.



Fully leverage AF to build flexible, scalable and configurable data structures and calculations!

- Supports integrated **event** and **schedule** based **calculations** and rules.
- **Easy to expand** as new requirements arise.
- Supports **open integration** with a full SDK.



Define Key Performance Indicators

Standards (ERP)

Overweight

Production

Material

Labor hrs.

Key Metrics (MII)

% OEE

% Standard

Lbs. Produced

Variances



Calculate and maintain metrics at the lowest level possible!

Key Inputs
(PI Tags)

In Count

Speed

Machine Mode

Reason Code

Out Count

Producing State

Reject Count

Pack Ratio

Hershey's Asset Intelligence Solution – The PI System

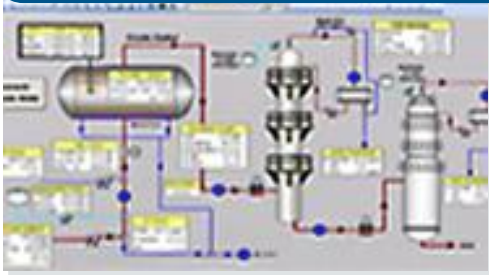


This is the layer where Engineers and Maintenance personnel focus...

When information is provided to these groups in real-time changes

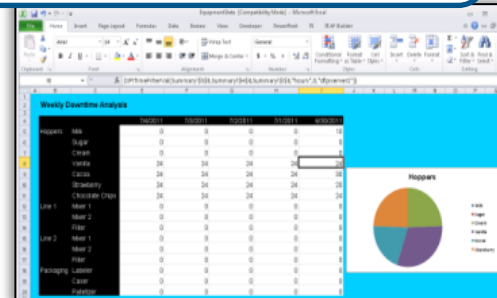


Fit the tool to the task!



PI ProcessBook

resulting in quick actions that benefit the entire organization.




PI DataLink

Hershey's Manufacturing Intelligence Solution - MII

Core Services

Performance Status




Event Logging




Management



E- Check Sheets



E- Log Books



Alerts, Warnings & Escalations



Role Based Dashboards

Supervisors

Operators

Engineers

Plant
Managers

Executives

Maintenance
Technicians

Information Delivery

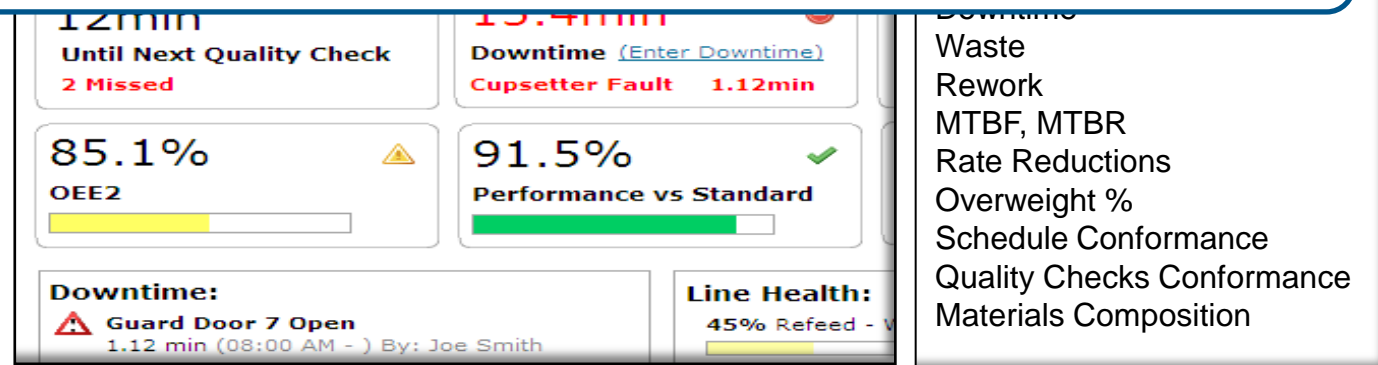
**Electronic
Scoreboards**



**Mobile
Access**



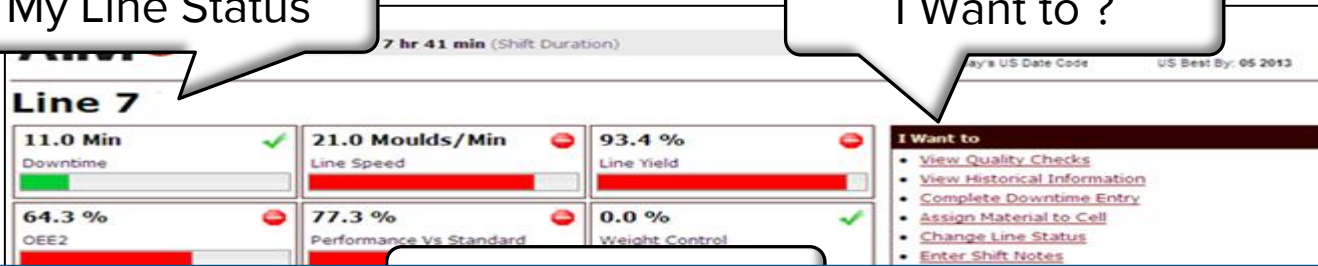
Design solutions from the users perspective!



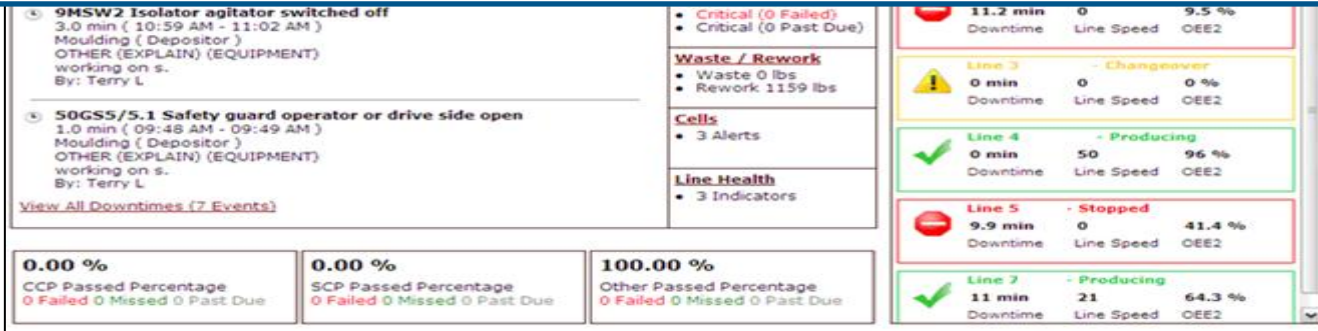
Operator Production Management Cockpit

My Line Status

I Want to ?



Think in terms of the first person “I” and ‘My’!



Targeted Applications – E-Downtime

The screenshot displays the AIMO E-Downtime application interface. At the top, it shows the AIMO logo, a status bar indicating 'Producing - 6 hr 8 min (Shift Duration)', and a welcome message for user STUL43OPR01. The interface includes a sidebar with navigation links such as 'Complete Downtime Entry', 'Assign Material to Cell', 'Enter Shift Notes', 'View Shift Notes', 'View Historical Information', 'View Quality Checks', and 'View Process Operation Guides'. The main content area features a 'My Cell Status' section with a table of equipment status and a 'Next action due' section with a list of tasks and their due times.

PI System generated events.

Categorizing operator initiated events.

My Cell Status

Next action due

Minimize required data input through automated data collection whenever possible.



Target Application – E-Clean/Inspect/Lube

Table Data

Visual Status

CIL Schedule View				01	02	03	04	05	06	07	08	09	10	11
Component	Time Est.	Freq.	Run/Stop											
Supply Cart			Run		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Tool Board			Run		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Wrap Inventory	1	S			✓	✓	✓	✓	✓	✓	✓	✓	✓	



Strive to provide graphical and visual data views. A picture is worth 1000 words!

Crimper Vacuum	1	W	Run		✓									
Conveyor Infeed Belt Leg # 2 MC43069	1	S	Stop		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Conveyor Metering Belt # 1 Leg # 2 MC	1	S	Stop		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Conveyor Metering Belt # 2 Leg # 2 MC	1	S	Stop		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Metal Detector Leg # 2 XX43011	1	S	Run		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Conveyor Inspection Leg # 2 MC43074	1	S	Stop		✓	✓	✓	✓	✓	✓	✓	✓	✓	



Targeted Actions – E- Defect Logging

AIMO

Welcome STUL43OPR01 STUL43OPR01 ([Logout](#))
01/26/2015 02:00 PM Shift: 1
Today's US Date Code: 52L07Y1 US Best By: 01 2016

[Home](#) > Update Defect Log

Line 43

Filter Options

Start Date: 01/19/2015 Start Time: 12:00 AM

I Want to

Integrated SAP Actions!

Apply Filters

- [Complete CILs](#)
- [View CILs](#)

Defect ID	Status	Type	Description	Action	Action to Fix	Area	Equipment
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Integrate business actions to minimize number of user interfaces. Leveraging MII!



Target Applications- E-Operating Guides



Producing - 6 hr 11 min (Shift Duration)

Process Operating Guides



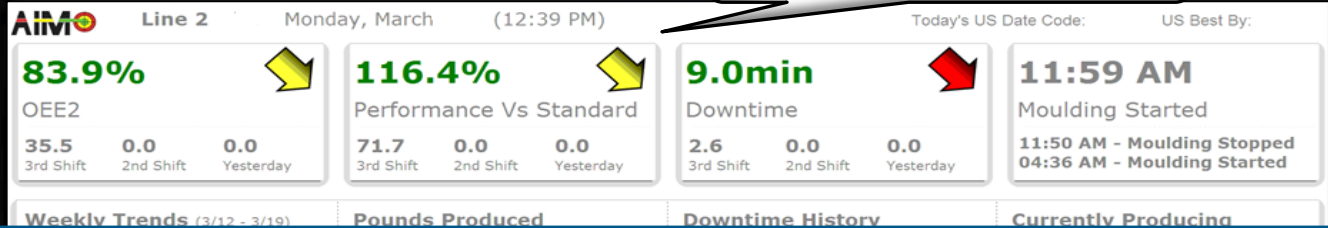
Electronic documentation provides operators with most current “How To” direction!

- Section 4: Shutdown
- Section 5: Cleaning
- Section 6: Changeover
- Section 7: Troubleshooting
- Section 8: Quality
- Section 9: Job Description
- Section 10: Document Management



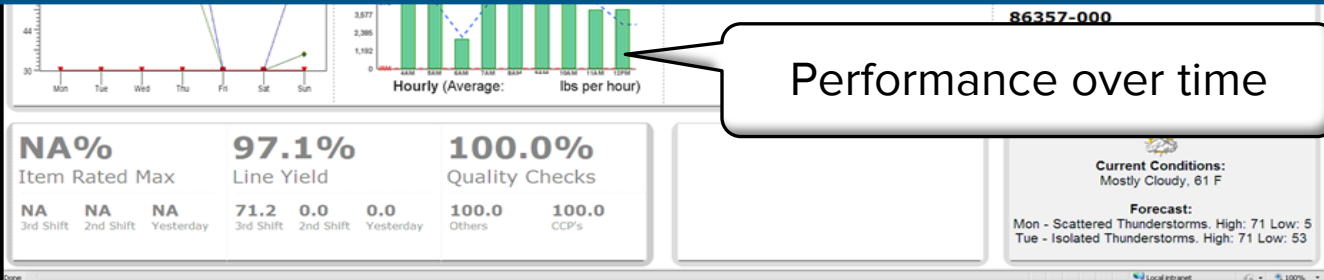
Performance Summary Scoreboards

Trending Direction

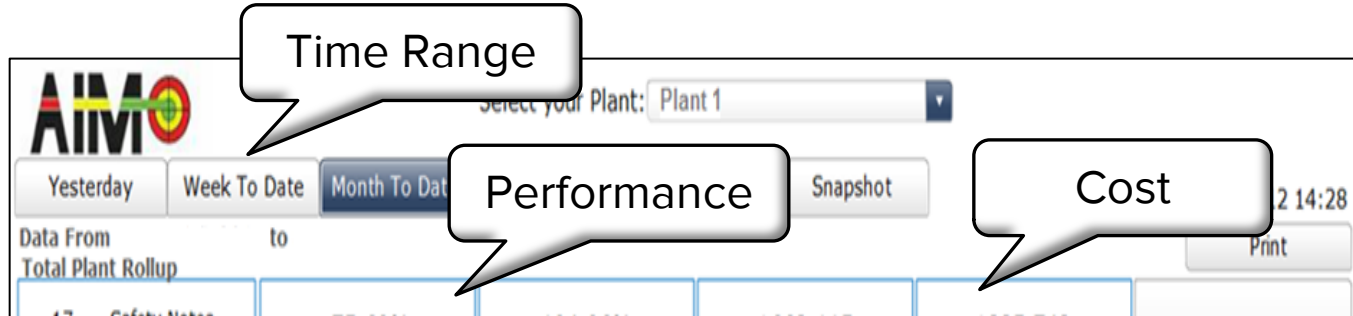


💡 Trends are more useful than single data values!

Performance over time



Plant Performance Dashboard



Speak in the language of money whenever possible!

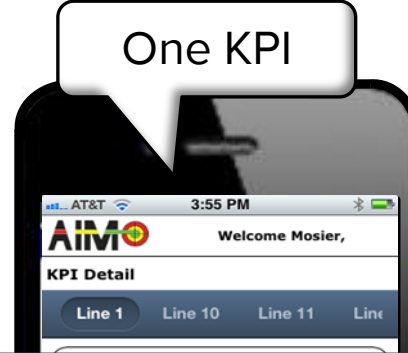
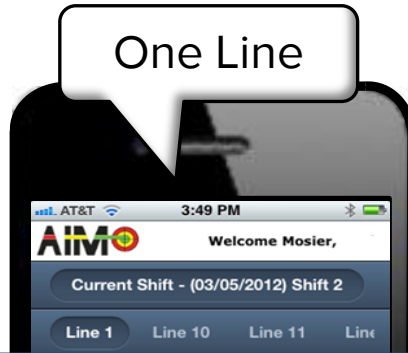


Mobile Line Performance

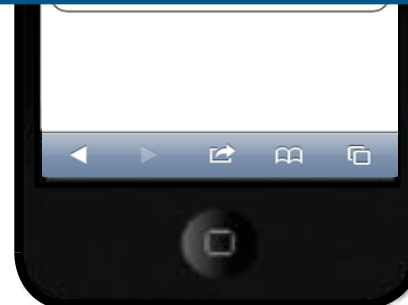
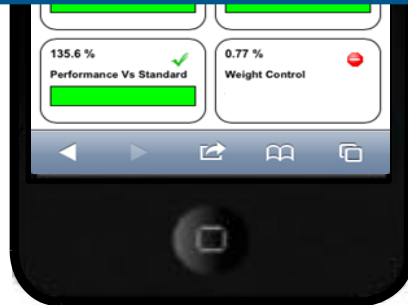
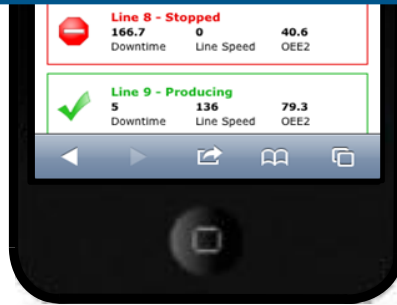
All Lines

One Line

One KPI



💡 Mobile is no longer optional. Keep it simple!



Sweet Results!

Post AIM implementation results after 3 years.

- Breakdown & Maintenance Repairs  33%



Measure and publish results to maintain momentum and continued investment!

- Quality Losses  22%



Ongoing Innovation

- Ongoing - Expand the Asset Framework
- 2015 - Changeover Management (PI Events)
- 2015 - Cleaning and Sanitation Management



Up front investment in highly flexible, open, configurable and scalable architectures provides agility for continued value generation at incremental cost.

- 2016- Add industrial network, systems and controls status monitoring. (PI System Monitoring)
- 2017- Batch Intelligence (PI Events & PI Batch)



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Questions

Please wait for the **microphone**
before asking your questions

State your
name & company





THANK YOU

Help your plant come together with PI.