

OCTOBER 24, 2023

Promoting digital health of the process by enabling decisions with the AVEVA™ InTouch HMI web client

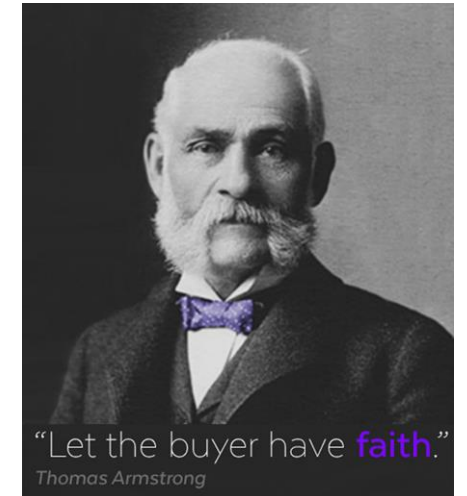
Ian Cother

AVEVA



Company History

- Armstrong's history dates back more than 160 years. The company began in a tiny two-man cork-cutting shop in Pittsburgh, Pennsylvania, when America's national frontier barely reached beyond the Rocky Mountains.
- Thomas Armstrong started Armstrong Cork Company in 1860. Four years later, he was putting his name on every bag of Armstrong corks with a written guarantee tucked inside – branding his product and standing behind it. That philosophy has always been to operate with trust and integrity: “Let the Buyer Have Faith.”





Ian Cother

Manager, Operational Technology & Analytics

- Armstrong World Industries
- icother@armstrongceilings.com

A graduate of the British Army school of electronic and aeronautical engineering with a 34-year career progressing through various roles in military, automotive (Tier 1 OEM supply into Fiat, Toyota, Lamborghini, Nissan), wood processing, system integration and ceiling tile manufacture.

Integrating control systems and lean manufacturing into Armstrong manufacturing plants with an instrumental role in leading the development and deployment of digital shop floor systems where he is passionate about process improvement and changing the way operations view the processes they control giving insights into previously hidden operational data.

Armstrong World Industries reduces downtime and scrap across multiple production lines.

- Lack of visibility into operational data at the locations that need to see it.
 - Cost and time to deploy across the business.
 - Needed to bring IT and OT sources into same solution.
 - To improve manufacturing line performance at a faster rate with sustained results.
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- Deployed AVEVA™ InTouch HMI web client for production line live status and summary reports across all our mineral fiber manufacturing sites.
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- **Deployed webclient across 15 production operations in 6 plants, one line saw a changeover reduction time of 21%**
 - **Faster real time information of scrap causes and counter measure effectiveness resulted in a scrap reduction of around 0.25%**



“ We no longer needed to wait for a production summary each hour to know if any changes had been successful, we now know within 5 minutes.”

Joe Alba, Value Stream Manager, Armstrong World Industries

Getting relevant information where it matters most

Several hurdles need addressing to achieve this

1. HMI/SCADA screens show if the equipment is running, it doesn't show how it is running.
2. Summary data reviewed after product runs are completed shows how you ran, too late to make any changes to performance.
3. Disparate systems are used to get the full picture, no view of these lineside.
4. No true live status of what's happening at point of operation.



Dashboard Layout

Requirement:

Key information to the operator of current conditions

In a clear manner that's easy to read & understand

so decisions can be made in real time.

Automotive is a prime example of this.

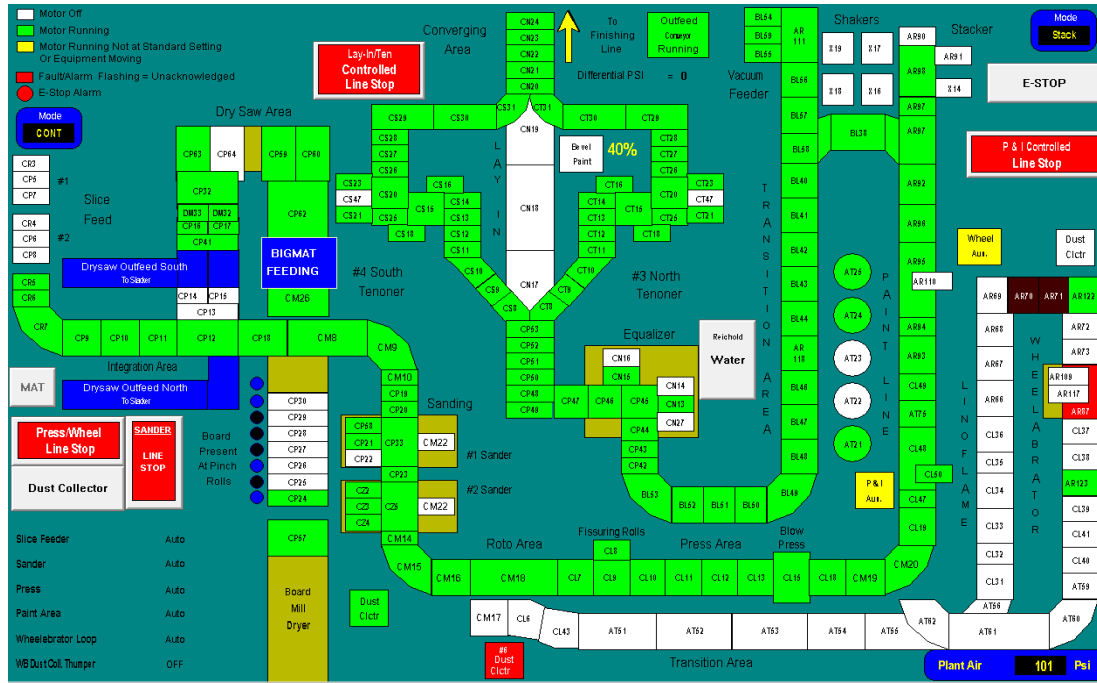
Dashboard Layout

70+ Years between them, same key information displayed.



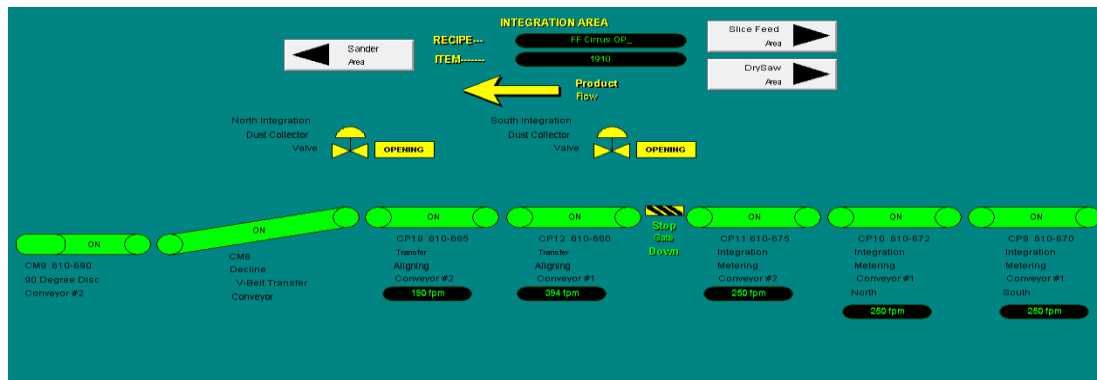
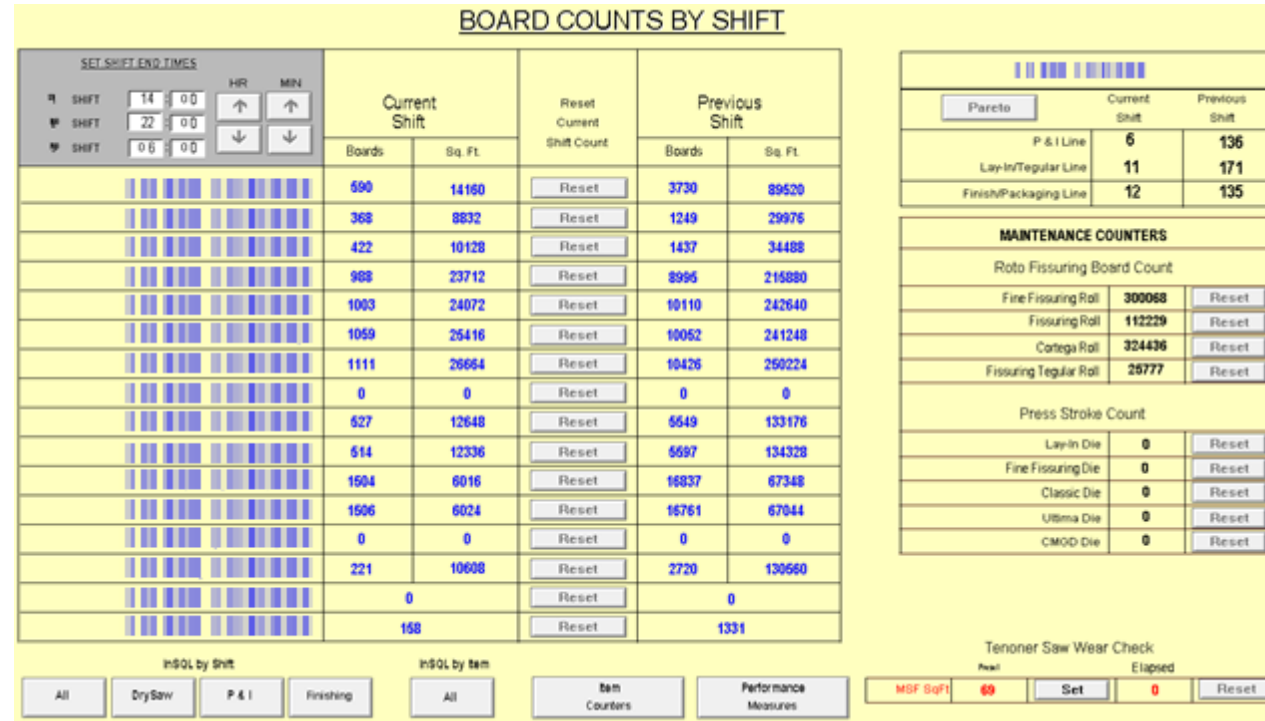


Traditional SCADA/HMI layout



Conveyors/Equipment running or not.

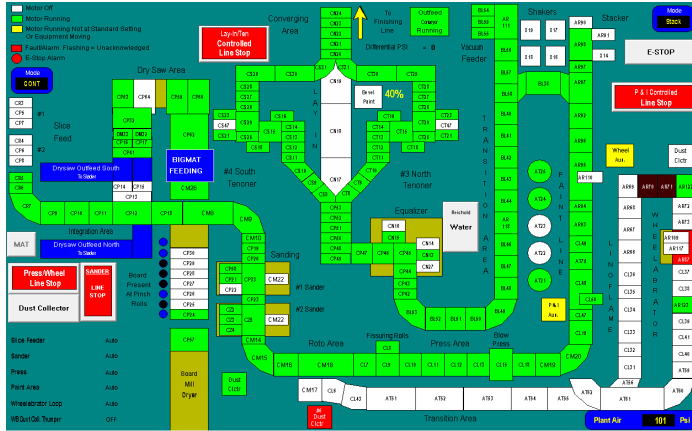
Summary product counts.





Old to New

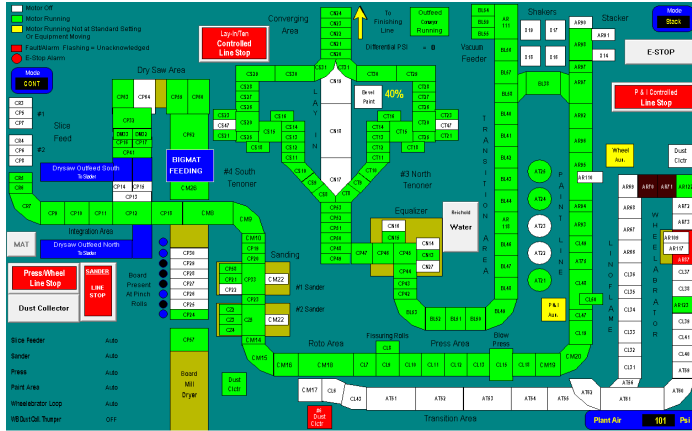
How are the Conveyors/Equipment running? Is product flow stable, are all machines at recipe setpoints, is something drifting?





Old to New

How are the Conveyors/Equipment running? Is product flow stable, are all machines at recipe setpoints, is something drifting?



CURRENT ITEM

Item Number **11111** Req'd Total **503,760**

Gross Count **503,760**

Item Start Time **07/12 07:16** Remaining **96,240** Feed Rate **155 BPM** Est. Finish Time **Wed Jul 13 19:02:24 2022**

FEEDER BOARDS PER MINUTE (24hrs)

West_Lft

East_Lft

Shift	Count
1st	7
2nd	2
3rd	11

AR118

BL48

BL52

CP43

FEEDER

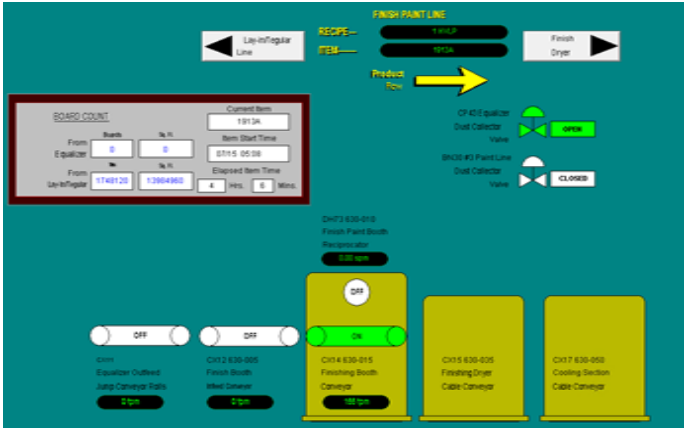
AR111 BL56 BL57 BL58 BL40 BL41 BL42 BL43 BL44 AR118 BL46 BL47 BL48 BL49

Line Status: LINE RUNNING

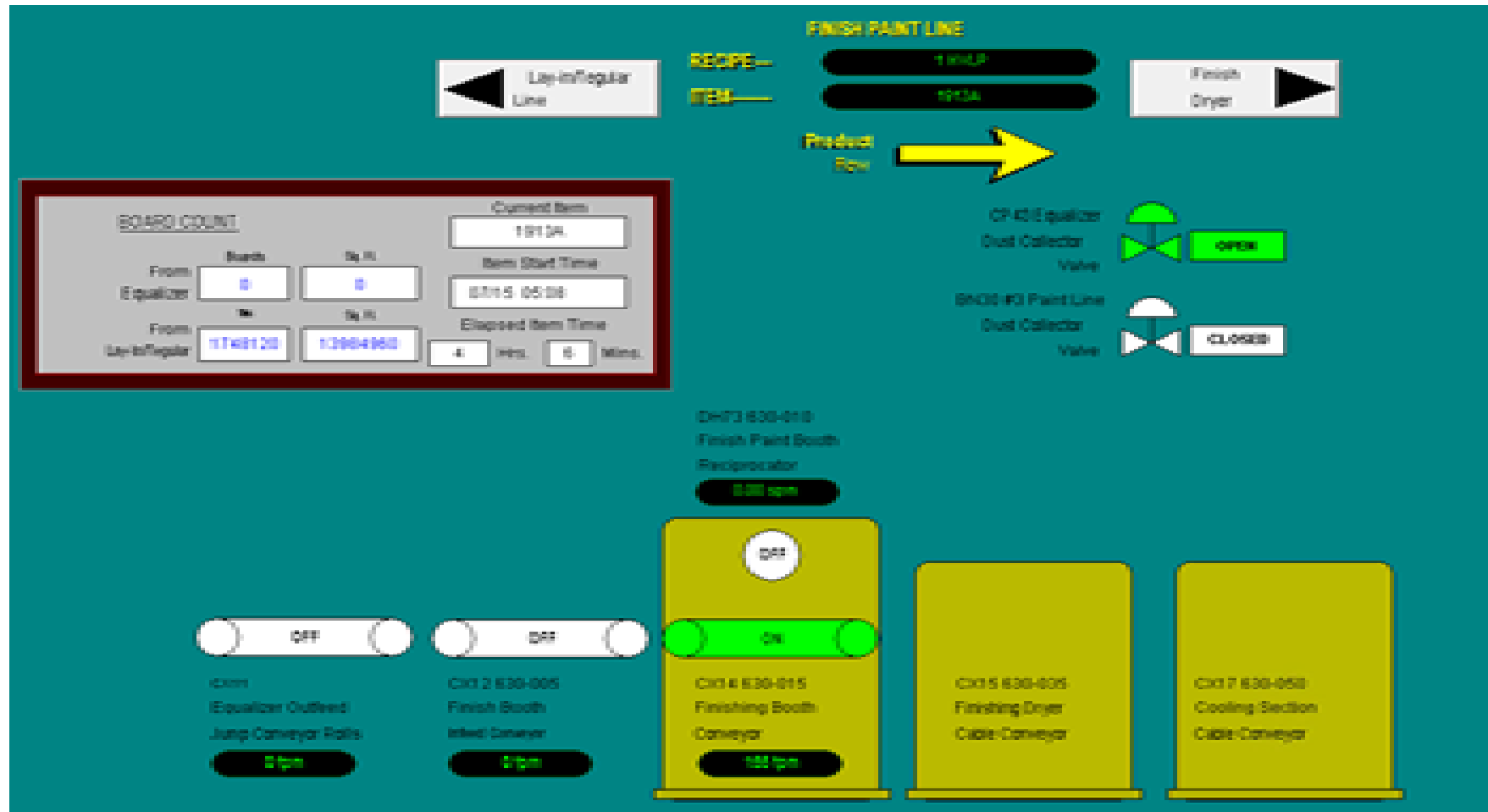
EQUALIZER

CP45 CP44 **15 Ft/Min** CP43 CP42 BL53

Old to New

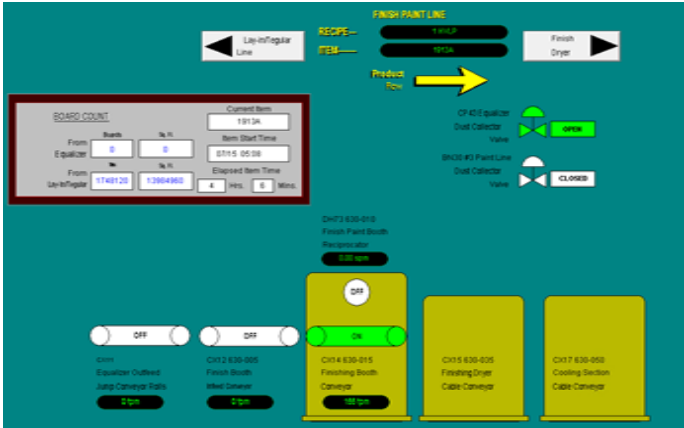


For the health of the paint operation, flows, pressures, fan speeds are shown in a way you can see if they are within their correct operating windows.

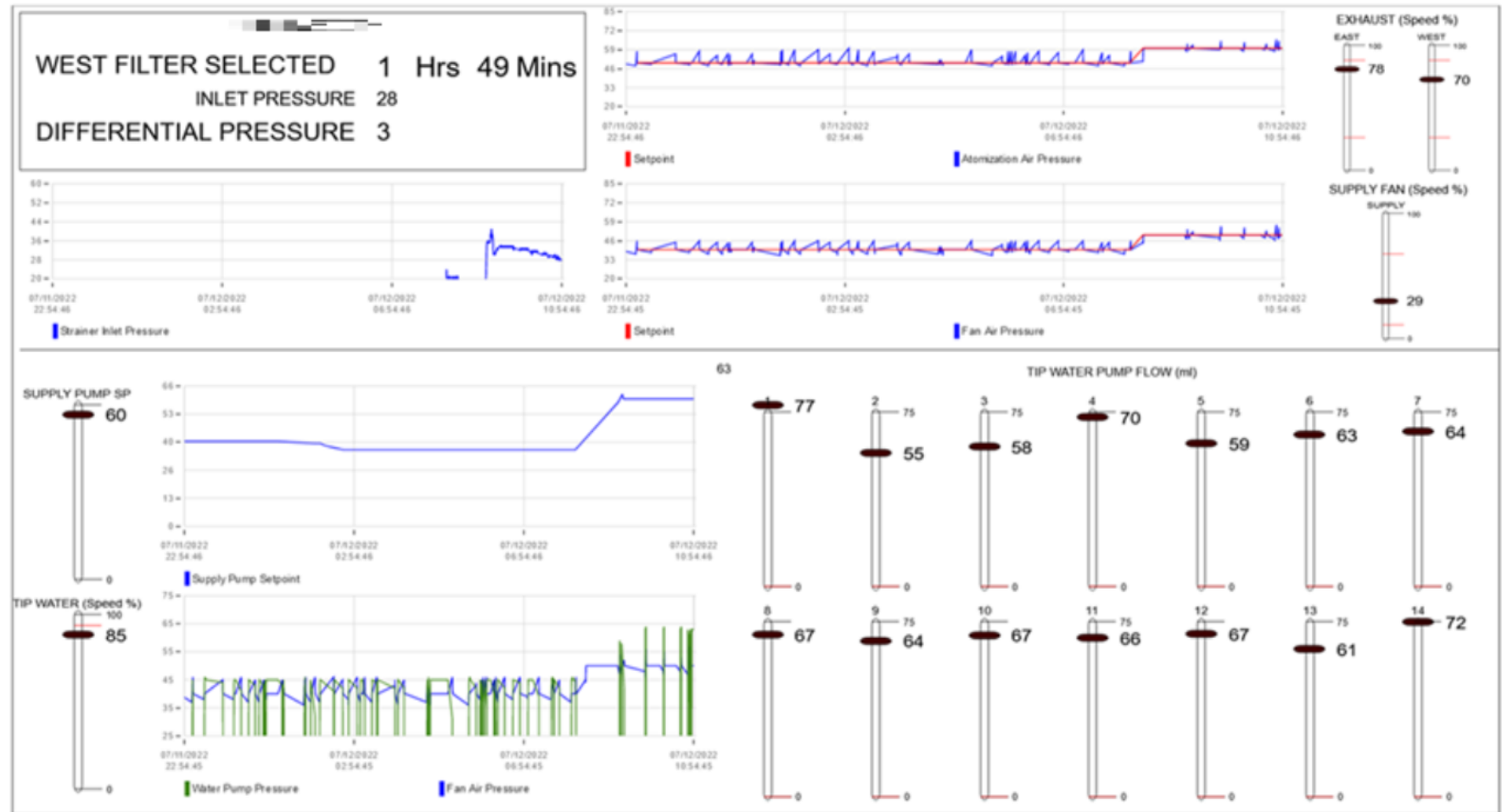




Old to New



For the health of the paint operation, flows, pressures, fan speeds are shown in a way you can see if they are within their correct operating windows.



Maintenance screens added – (this shows blade life for cutting operations).
 Weekly team review, any identified as end of life will have new blades staged at machine ready for changing at next opportunity.



TENONER #2 SAW HoP

West

East

<u>2nd Station</u> Top Lay-in 156602-2 Linear Ft 594,733.9	<u>3rd Station</u> Top Sqr Cut 156593-2 Linear Ft 1,255,187.0	<u>4th Station</u> Top Calla Vector 169444-1 Linear Ft 242,455.1	<u>2nd Station</u> Top Lay-in 156602-2 Linear Ft 594,733.9	<u>3rd Station</u> Top Sqr Cut 156593-2 Linear Ft 1,255,187.0	<u>4th Station</u> Top Calla Vector 169444-1 Linear Ft 376,004.1
<u>2nd Station</u> Bottom 2 Deg Ang 156603-1 Linear Ft 0	<u>3rd Station</u> Middle Ultima Vector C/D 156604-1 Linear Ft 7,294.7	<u>4th Station</u> Mid/Top 45 Deg Bev Teg 156599-1 Linear Ft 65,090.4	<u>2nd Station</u> Bottom 2 Deg Ang 156603-1 Linear Ft 0	<u>3rd Station</u> Middle Ultima/Vector C/D 156604-1 Linear Ft 7,294.7	<u>4th Station</u> Mid/Top 45 Deg Bev Teg 156599-1 Linear Ft 65,090.4
	<u>3rd Station</u> Bottom Ultima/Vector C/D 156598-1 Linear Ft 6,794.1	<u>4th Station</u> Mid/Bottom 30 Deg Ang Teg 156600-1 Linear Ft 7,294.7		<u>3rd Station</u> Bottom Ultima/Vector C/D 156598-1 Linear Ft 206.8	<u>4th Station</u> Mid/Bottom 30 Deg Ang Teg 156600-1 Linear Ft 7,294.7
<u>5th Station</u> Irons Linear Ft 5,116,313		<u>4th Station</u> Bottom 15 Deg Ang Teg 156601-1 Linear Ft 640,881.8	<u>5th Station</u> Irons Linear Ft 5,116,313		<u>4th Station</u> Bottom 15 Deg Ang Teg 156601-1 Linear Ft 640,881.8

Simple to understand but with all the information needed



Schedule –are we ready for the next product(s)?

Current Item – Where are we in the planned run?

Paint storage details – Do we have enough?

Are key product flow metrics green? And how well are we running those assets?

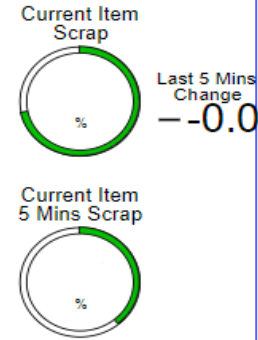
Where have there been issues in this area?

How are the quality checks for this item?

Simple to understand but with all the information needed



Item #	Family	Size	Edge Detail	Bundle Count	Finish Paint	Paint Tanks	Standard	Scrap Target	Prod Target
Currently Running				1864	303		Standard		
					303		Standard		
					303		Standard		
					303		Standard		
					303		Standard		



CURRENT ITEM

Item Number [REDACTED]
Description [REDACTED]

Req'd Total [REDACTED]

Feeder Count [REDACTED]

Item Start Time [REDACTED] Remaining [REDACTED] Feed Rate 12.50 BPM

Est. Finish Time Tue Jun 20 15:01:34 2023

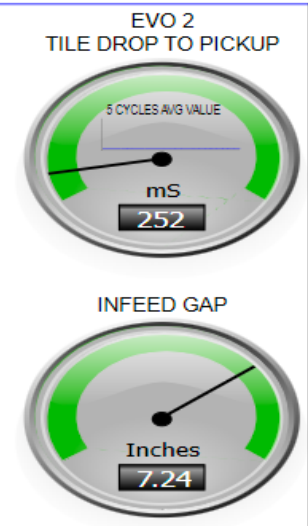
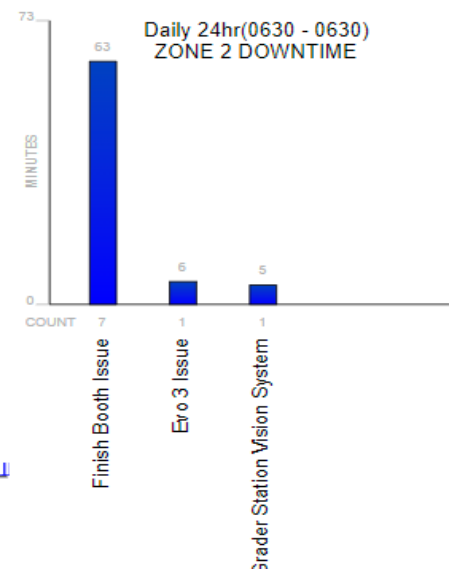
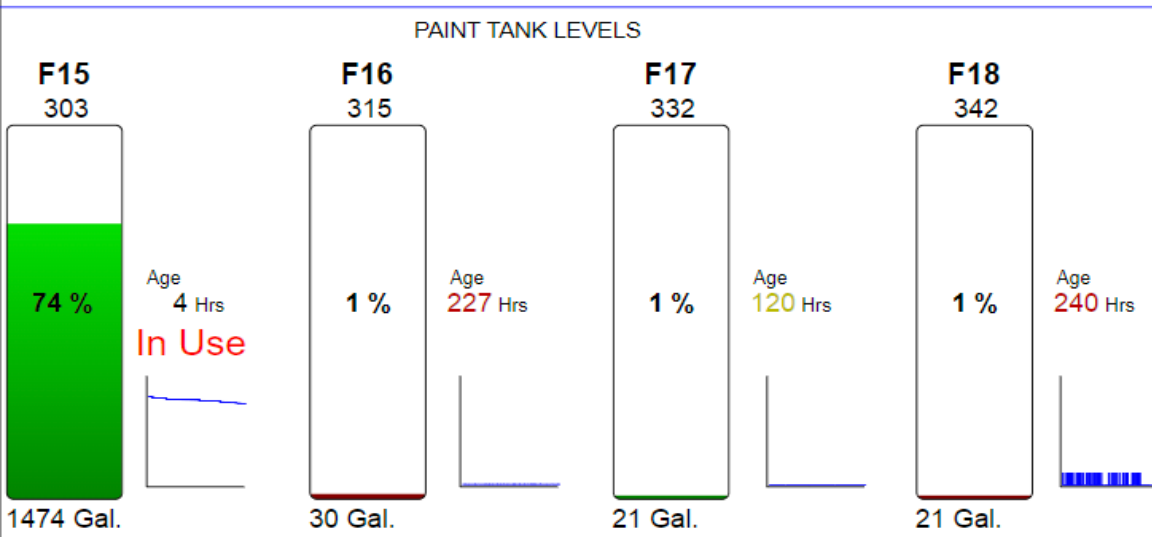
Line Status: LINE RUNNING
Stop Reason: [REDACTED]

Req'd Total [REDACTED]

Bundle Count [REDACTED]

Remaining [REDACTED] Scrap Target [REDACTED] %

FEEDER 2 HOUR BPM



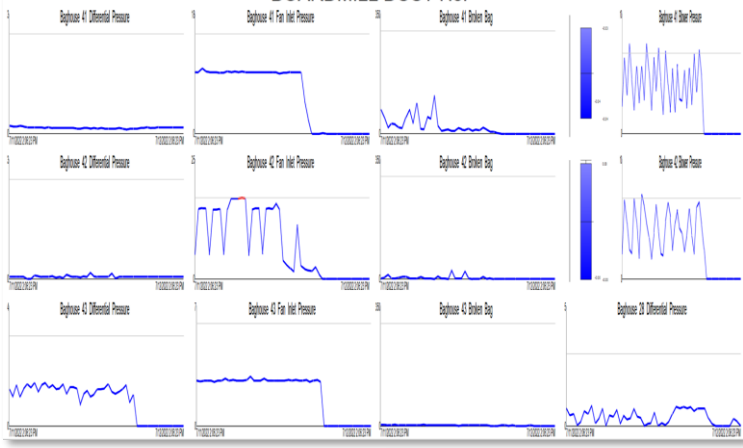
FINISH PAINT HoP

ITEM [REDACTED]

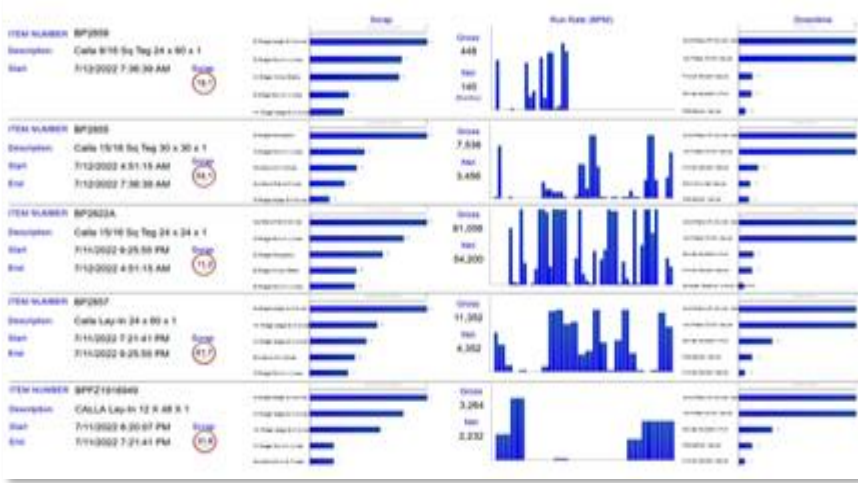
of Checks [REDACTED]



BOARDMILL DUST HoP

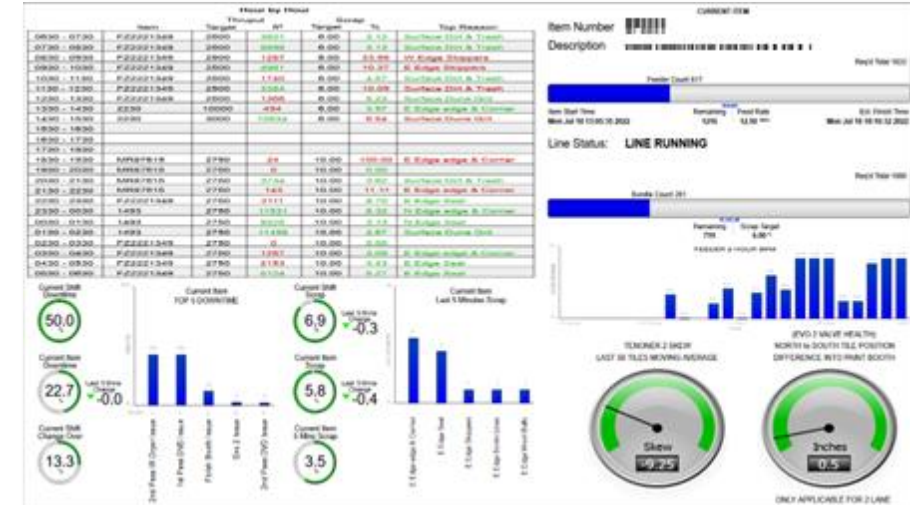


Health of the Dust collection systems.



Immediate comparison between items for common cause issues.

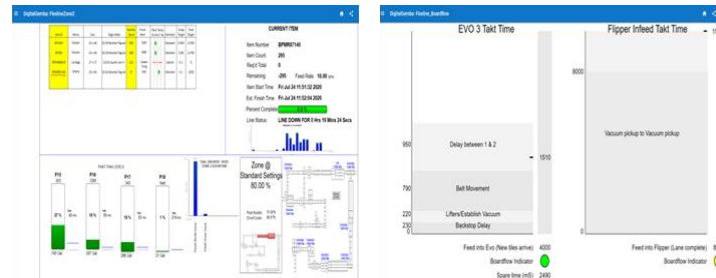
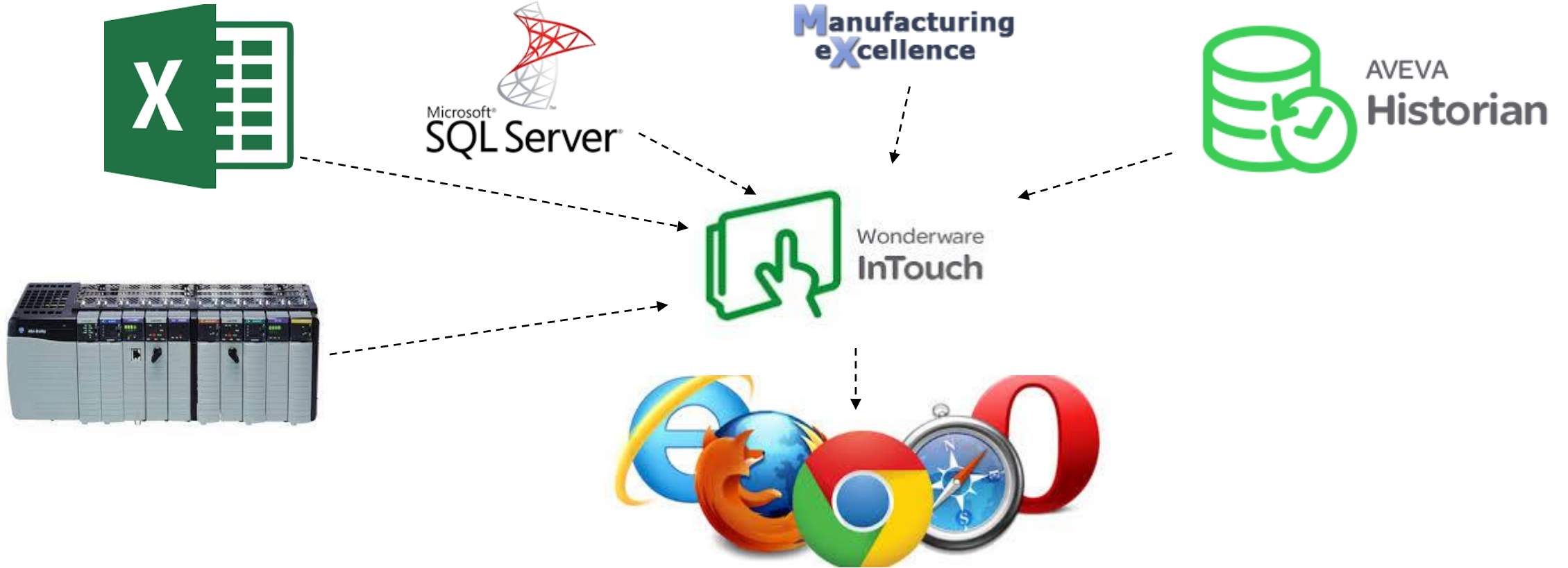
Line performance metrics: Rate, Orientation, scrap causes all live.



“Data lakes are wonderful things but for those of us dealing with siloed information, as long as AVEVA™ InTouch can reach it, getting the information into a single user interface is simple.”



Getting disparate information into a single interface



HTML5 Webpages – Digital Gemba & HoP Screens



Implementation Details

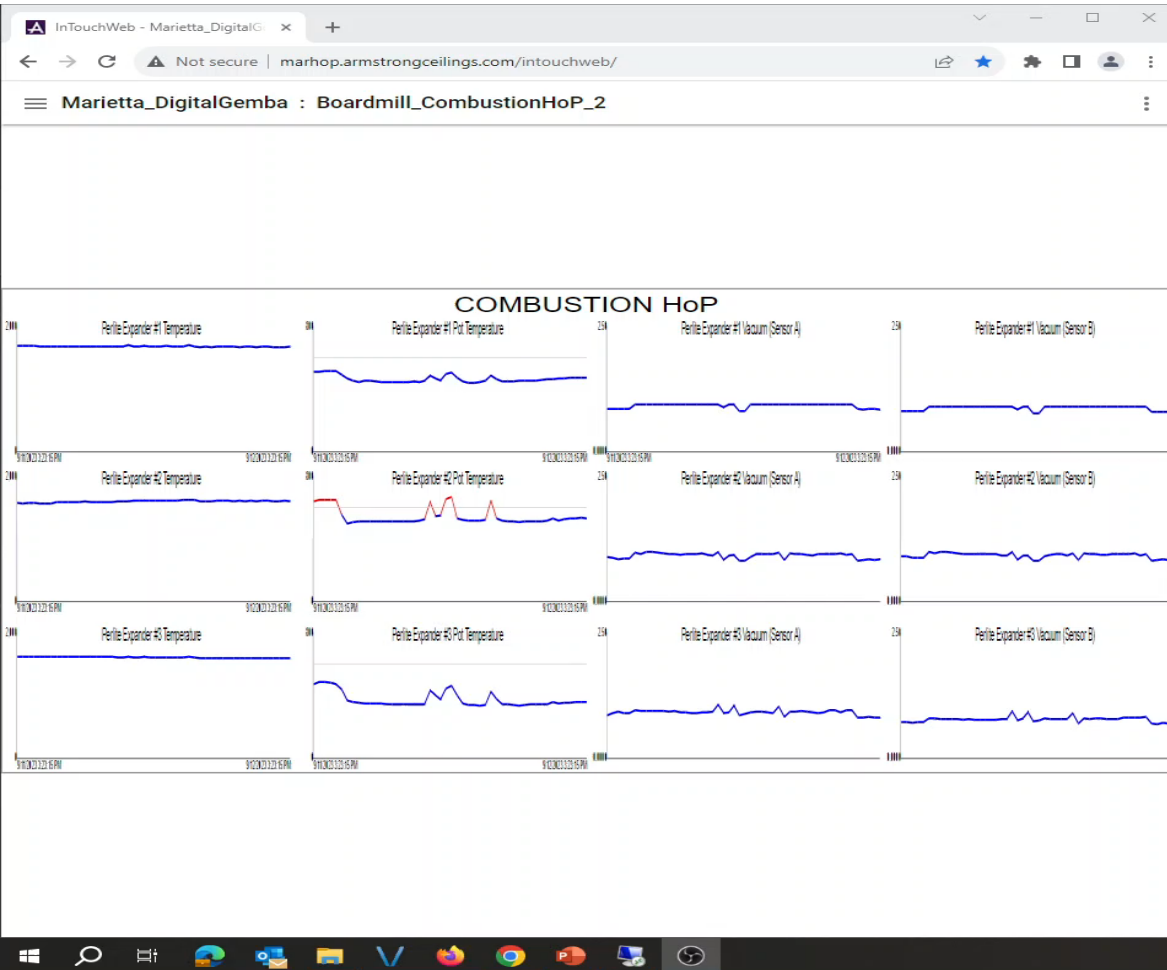
- Create the industrial graphics in Windowmaker
- Folder and graphics names are carried across to web client
- Run Windowviewer (web client needs this to operate)
 - It can be set to Run as a Service.
- Open a browser, select the server running InTouch HMI Windowviewer
- Additional security permissions can be configured for Read/Write access



Implementation Details

Google Chrome Browser

AVEVA InTouch HMI WindowMaker



Impact & Benefits

Web client assists in reducing Production line changeover times by an average of 20%

Challenge

- Changeovers on our most technically complicated line were taking too long, there was no clear indication when it started or where you were against target so supervisors didn't readily know where to focus resources.

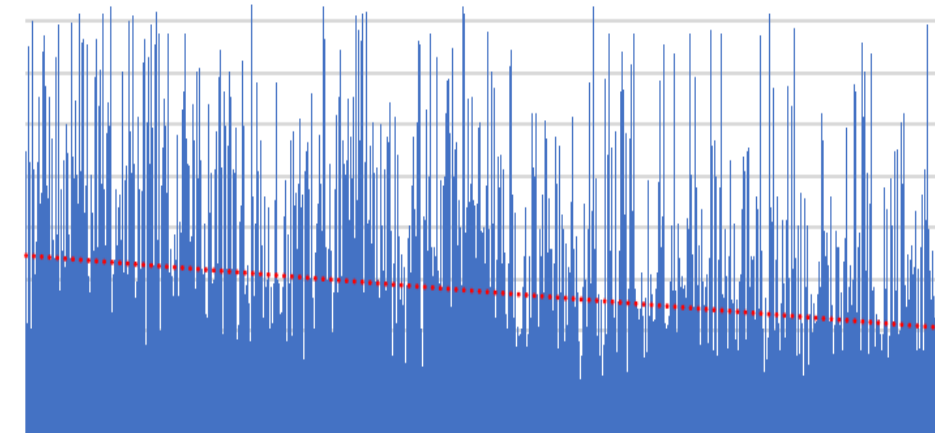
Solution

- Item specific target changeover time read into AVEVA InTouch HMI, a running countdown timer prominently displayed around the line.

Results

- **Average changeover reduction from 19.76 minutes to 15.66 minutes**
- **Typical 80 to 100 Changeovers a month, over 6 hours additional capacity generated.**

Item Changeover Time



Impact & Benefits

Web client gives immediate feedback of running status.

Challenge

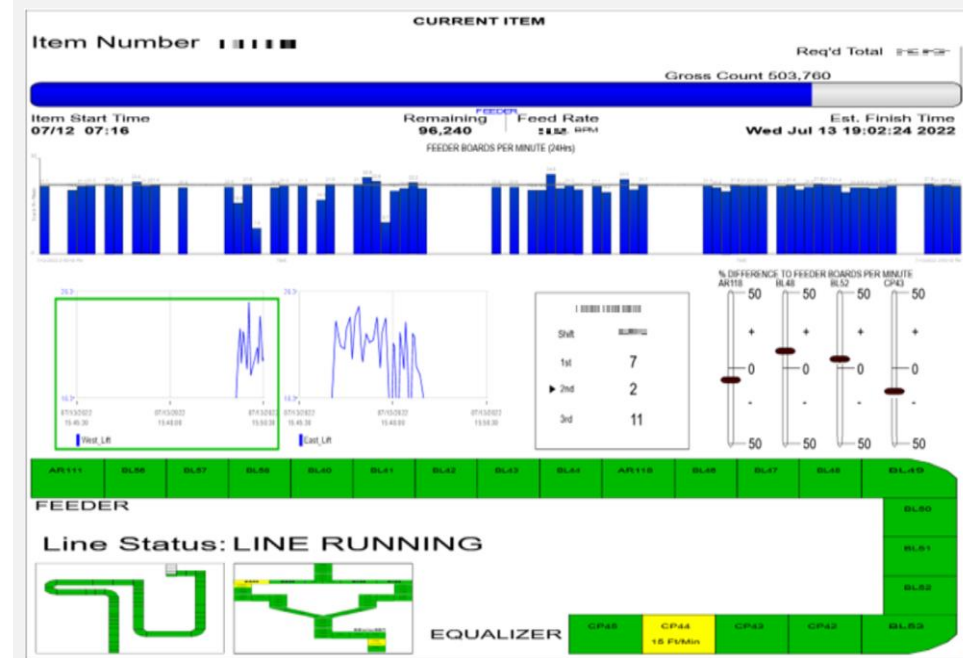
- Local HMIs mounted on equipment throughout the production line are used for control, no higher-level monitoring existed. No one on the line could easily see how the equipment they were responsible for was performing.

Solution

- Including personnel who work in the area as part of the screen layout and content development process enabled new displays to be deployed using AVEVA web client to be beneficial from start and allowed reactions to problems that were originally hidden.

Results

- The information displayed (trend) assisted maintenance with troubleshooting and rectifying the root problem (valve). The result was a thrupt gain of approx. 7,500ft² per hour.



“ We were losing rate that we simply weren’t aware of, the new screen showed it clearly and we were able to get the problem investigated and fixed.”

Scott Martin, Value Stream specialist, Armstrong World Industries

Impact & Benefits

Web client was instrumental in getting information displayed at a remote line.

Challenge

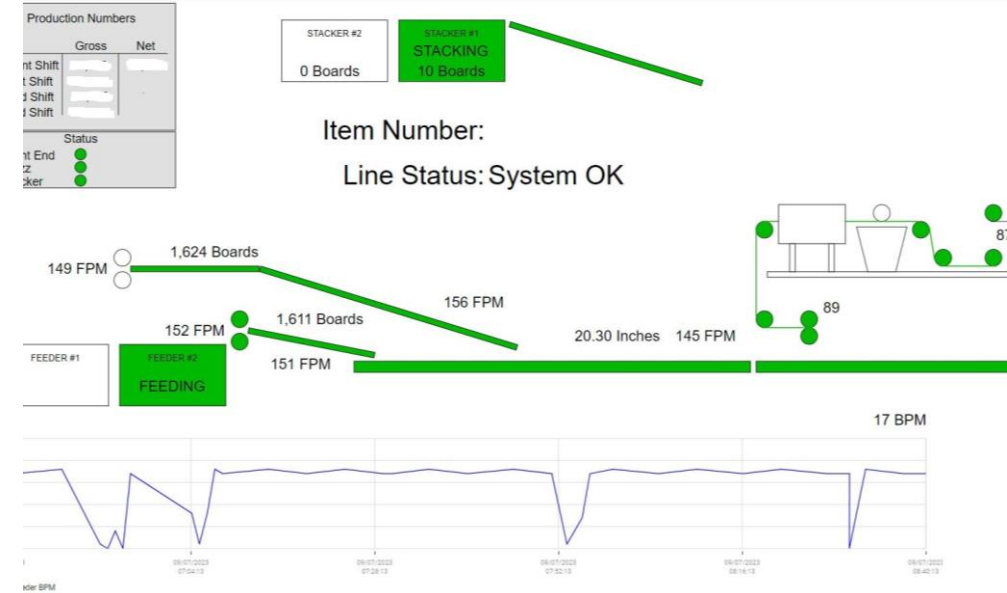
- A production lines had no local HMI screens so there was no view of how the equipment was performing, the challenge was to add local monitoring with the ability to perform new item selection at a low cost.

Solution

- Deployed AVEVA InTouch HMI web client screens for running status and changeover product selection.

Results

- Screen was developed and deployed within 1 day
- Key information displayed to all operators in the area via a 75" TV.
- Item changeovers via webclient screen.



“ We had wanted this in the lamination area for years but costs were restrictive, the speed which this was operational to us was impressive. It really helps the workers in the area.”

S. Campbell, Electrical Engineer. Armstrong World Industries

Summary & benefits





Webclient Health of the Process Benefits

- Live streaming of PLC & connected system information
- Low cost of deployment (TV, Access device, power & network access)
- Rapid development
- Scalable
- Multi level applicable (Operator, Supervisor, Maintenance)
- Culture change – focus on the now instead of the then
- Health of the Process allows proactive action before an emerging issue becomes a downtime event

Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!

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AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com