Productivity Improvement Through Continuous Contextualization of PI System Data

Presented by **James Li, Abbott Nutrition**
Shamus Cunningham, Seeq Corporation

Abbott
A Promise for Life

Seeq
Accelerate Industrial Process Analytics

Agenda

- Abbott Nutrition Overview
- Seeq Corporation Overview
- Business Challenge: Improve Productivity
- Use Case 1:
  - Improve Asset Utilization
- Use Case 2:
  - Improve Net-weight Control
- Key OSIsoft Products and Seeq Products
- Results Obtained and Business Impact
- Conclusion

IMPROVING LIVES FOR 125+ YEARS

1880s

Dr. Wallace Abbott advances the science of medications to improve accuracy and effectiveness.

1930s–1960s

Expands into vitamins and, later, infant formula, marking decades of growth in nutrition.

1970s–1980s

Creates the modern diagnostics industry with ground-breaking products.

1990s–2000s

Sharpens its focus on medical devices, to deliver unprecedented innovation.

TODAY

Abbott continues to shape new ways to bring better health to people all over the world, through diverse products and technologies.

LEADING WITH SOLUTIONS ACROSS THE SPECTRUM OF HEALTH

- #1 in blood screening
- #1 in immunoassay diagnostics
- Leading point-of-care platform
- #1 in drug-eluting and metallic stents
- #1 in laser vision technology
- Leading blood glucose monitoring platform
- #1 worldwide in adult nutrition
- #1 in U.S. pediatric nutrition
- Leading branded generics in key emerging markets

ADDRESSING HEALTH NEEDS AT EVERY STAGE, FROM NEWBORNS TO AGING ADULTS

- Nutrition
- Diagnostics
- Medical devices
- Branded generic pharmaceuticals

SCIENCE-BASED NUTRITION FOR ALL AGES

PEDIATRIC

- Infant formula
- Growing-up milk/toddler
- Supplemental mother

ADULT/MEDICAL

- Supplemental nutrition
- Healthy snacks
- Disease-specific (diabetes, cancer, kidney)

PERFORMANCE

- Elite athlete
- Sports and fitness enthusiast
- Active and healthy

Nutrition

AMONG THE MOST TRUSTED NAMES IN NUTRITION WORLDWIDE

PEDIATRIC
Infant Formula
Growing Up Milk/Toddler
Supplemental Nutrition

ADULT
Supplemental Nutrition &
Healthy Snacks
Disease-specific (Diabetes,
Cancer, Kidney)
Medical Foods

PERFORMANCE
Sports and Fitness Enthusiast

MAKING A NOTABLE DIFFERENCE

100 top Global Innovators, Thompson Reuters 2013

Fortune's Most Admired Companies since 1984; #1 in Medical Products in 2014

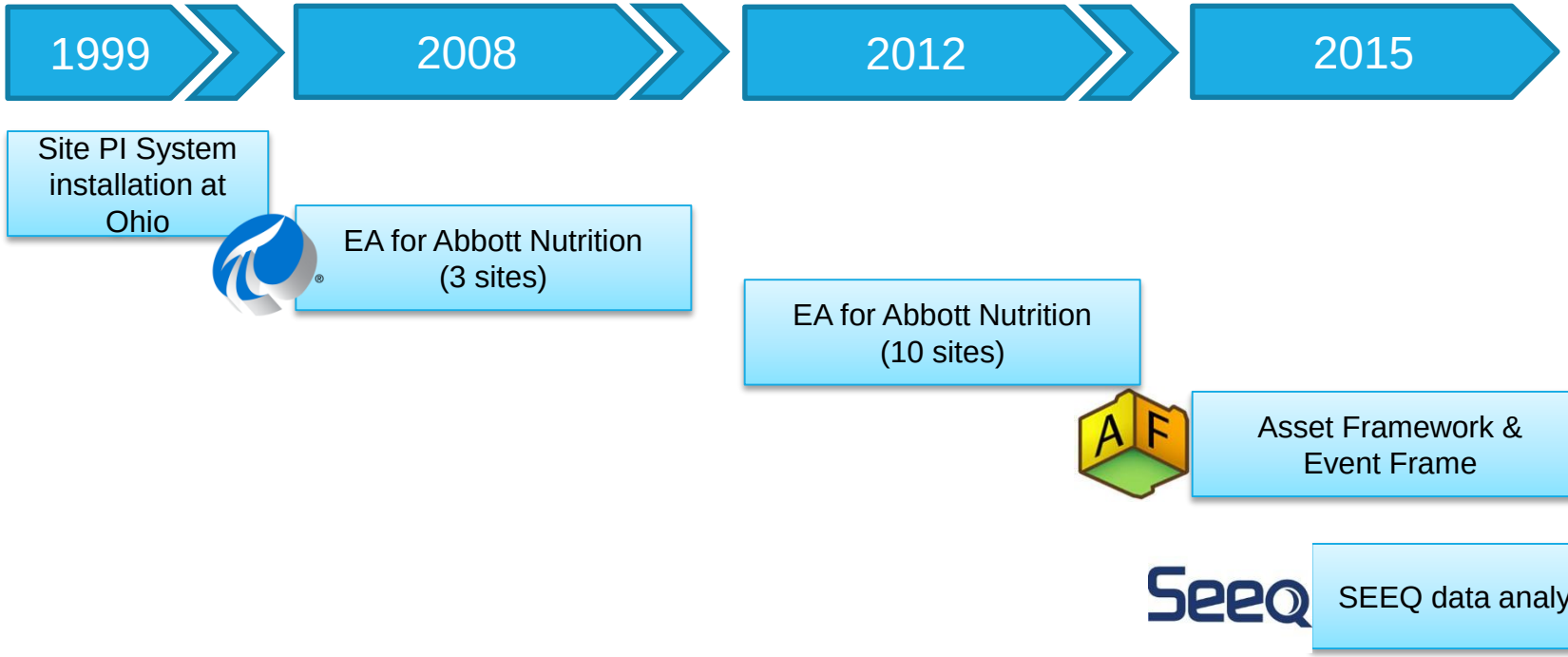
Top 20 BioPharma employer by *Science*, for 10 years

Top 50 Companies for Diversity by *DiversityInc.*, for 11 consecutive years

100 Best Companies by *Working Mother* for 14 years in a row

Industry Group Leader, Dow Jones Sustainability Index, 2013 and 2014; 10th year on the Index

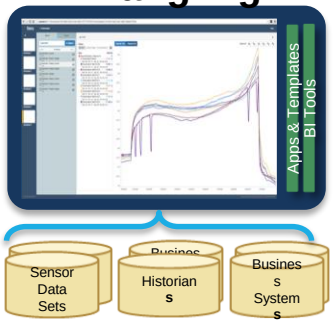
Timeline for OSIsoft PI System at Abbott Nutrition



Seeq

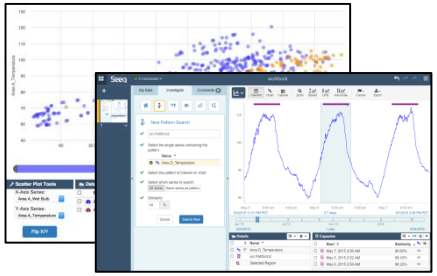
An Innovative Productivity Application for Engineers to Quickly Gain Even More Value from Their PI Systems.

Data Wrangling



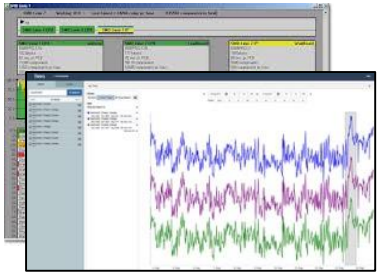
- Connect and Assemble Across Multiple Data Sets
- Interpolation and Normalization
- Data Quality and Cleansing
- Contextualization and Capsules

Engineering Investigation



- Search & Annotation
- Pattern Matching
- Modeling
- Calculations, Analytics, and Scripting
- Historical Benchmarking

Sharing Insights



- Performance Monitoring & Reporting
- TreeMap & Dashboards
- Real-Time Collaboration
- Journaling & Knowledge Capture
- Export to Excel & BI tools

Business Performance • Safety • Reliability • Golden Batch • Asset Health • Predictive Maintenance • Batch Quality Reporting • Real-Time Yield Analysis • Equipment Effectiveness • Downtime Monitoring ...

Improve Overall Plant Productivity

- Improve asset utilization
- Produce more saleable product
  - Without increasing variable costs

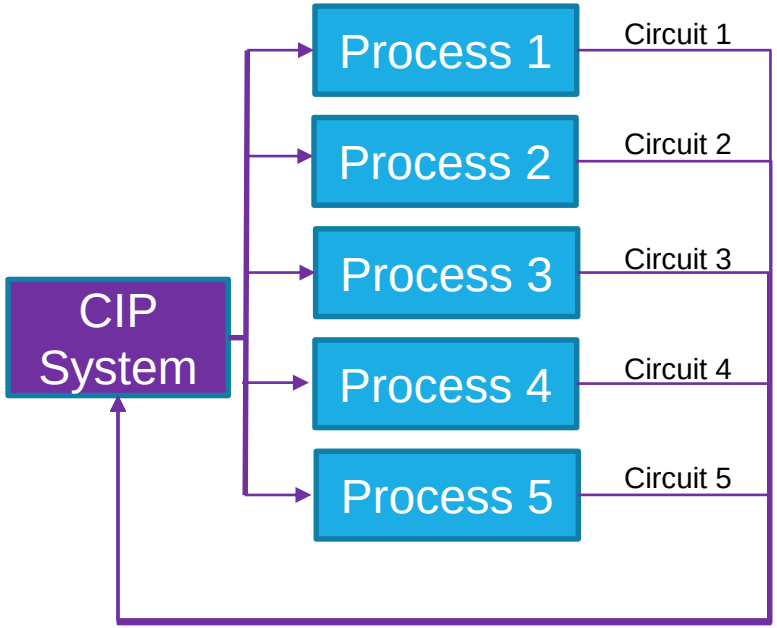
Use Case 1: Improve Asset Utilization

- Accurately identify asset and process states
  - "Context"
- Identify means to reduce time
  - With no impact quality
  - Or improve quality

- Clean-in-place (CIP) identified as candidate for improvement

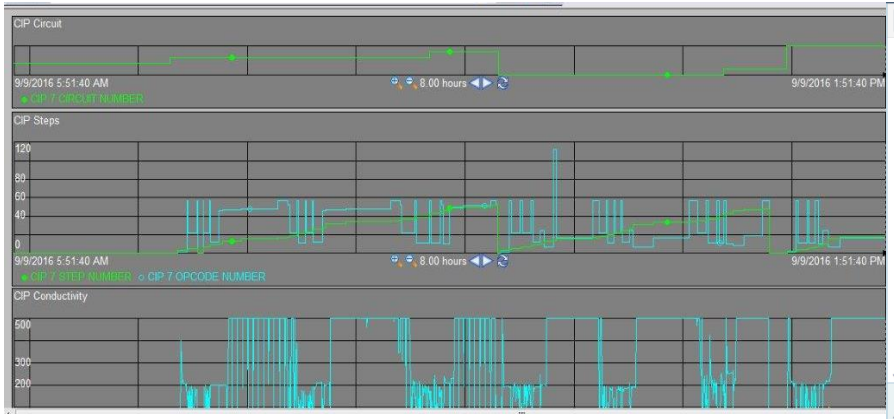
Characterize Clean-In-Place Process

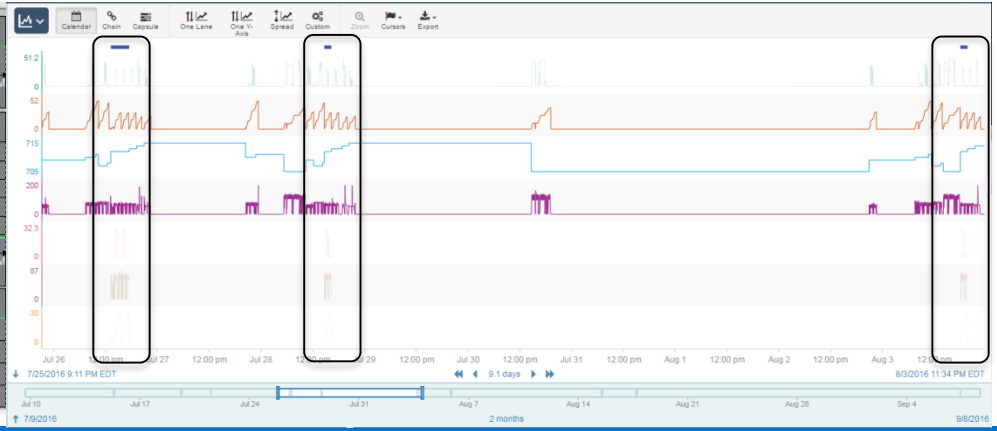
- Selected CIP system is comprised of multiple circuits
- Each circuit goes thru following phases
  - Caustic Circulation
  - Caustic Rinse
  - Acid Circulation
  - Acid Rinse
  - Final Rinse



Characterize CIP Process

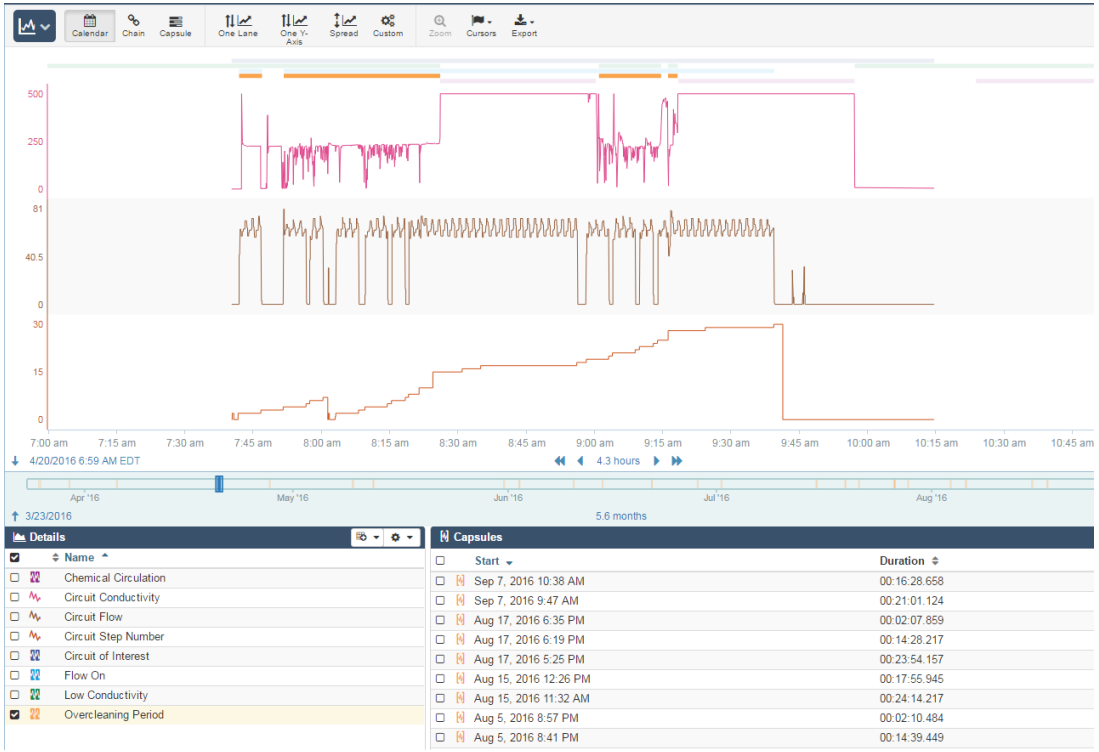
- Where are we spending time?
  - Create process model from the data
- Apply the model for different circuits
  - Use all available data to validate and improve the model



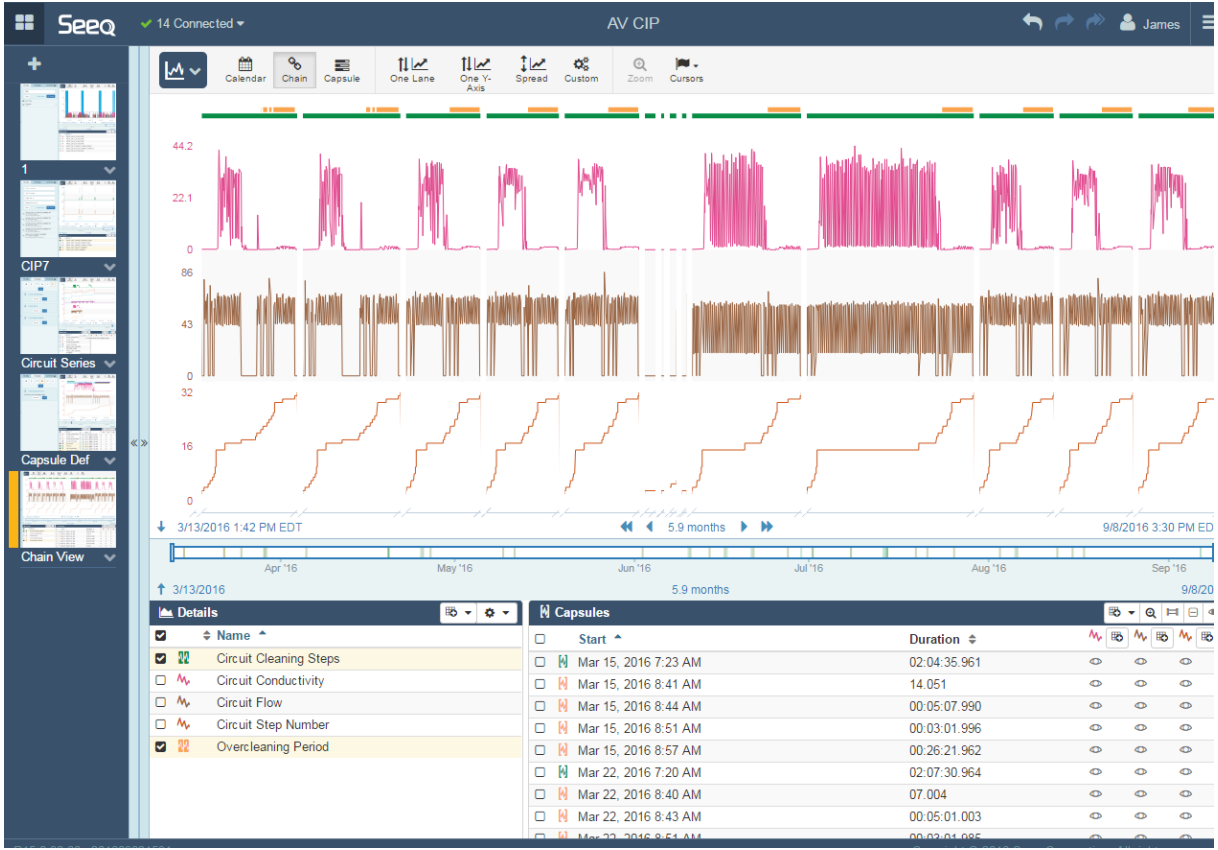


Identifying Excessively Long Procedures

- Determined we were over-cleaning
  - Circuit capsule
  - Phase capsule
- Rinse phase went past Critical Process Parameter Spec
  - Time saving duration



Identifying Excessively Long Procedures



Improve Asset Utilization

COMPANY and GOAL

Abbott Nutrition supports healthy lives from infancy to adult. Improving asset utilization is a key step in improving plant productivity.

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Difficult to accurately identify slower process states that are adversely affecting production.
Validate over all lines and plants

CHALLENGE

Identify asset and process states that can be improved to increase production.

SOLUTION

Leverage PI System data and unique Seeq analytics to pull process states from the data

- Rapid access to all data
- Quick model development and validation
- Implement improved control approaches
- Continuously validate effectiveness

RESULTS

Identified CIP rinse time reduction could be accomplished while maintaining high product quality.

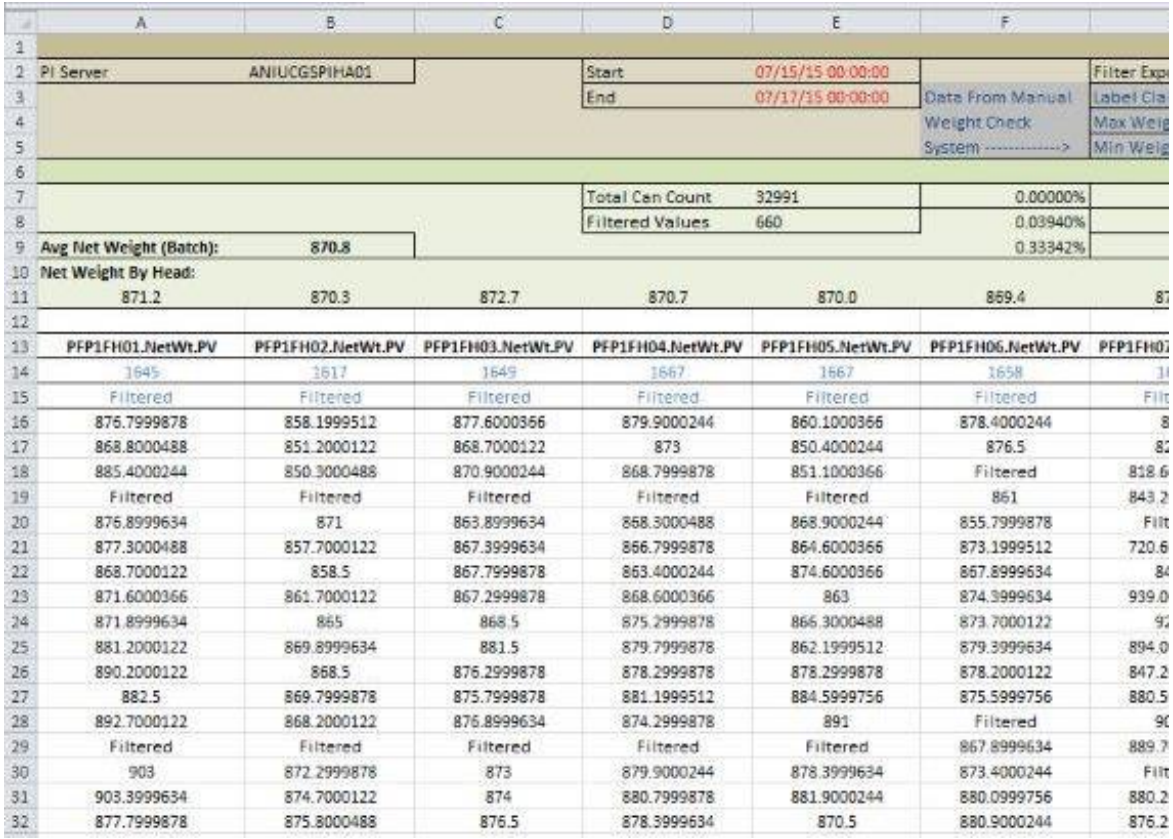
- Final rinse controlled to Critical Process Parameter rather than time
- Reduced cycle by an average of 20 minutes
- Aggregate impact of 3 hours increased production per line per month

Use Case 2: Improve Net-weight Control

- More precise packaging
  - Less give-away
- Also, reduce scrap

Integrate Fill System Data into the PI System

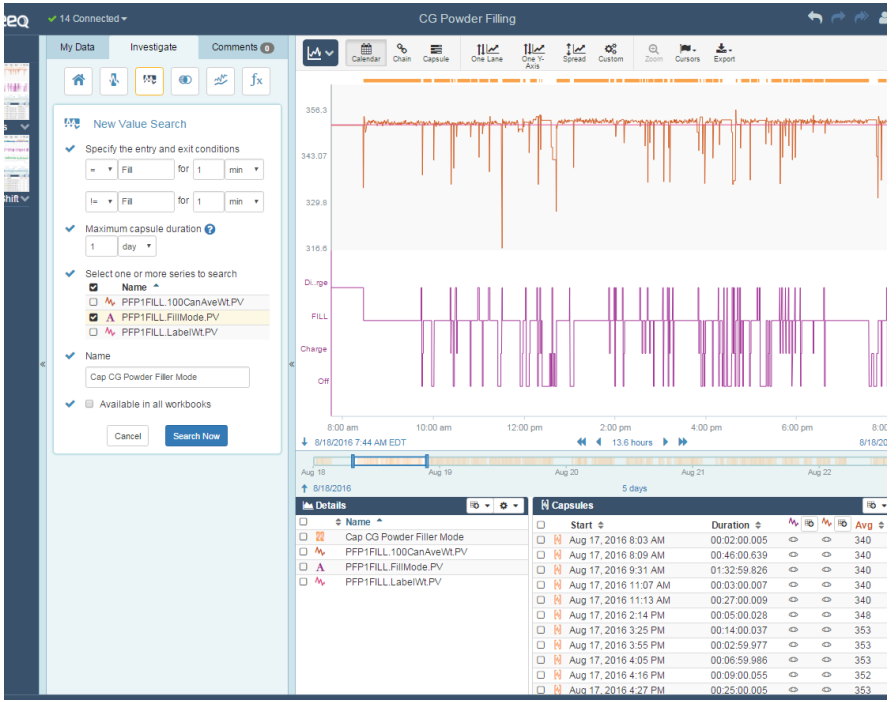
- Measure!
- Tighter set point control
- Validate weight minimum requirements are met



	A	B	C	D	E	F
1						
2	PI Server	ANIUCGSPIHA01		Start	07/15/15 00:00:00	
3				End	07/17/15 00:00:00	Date From Manual
4						Weight Check
5						System ---------->
6						
7				Total Can Count	32991	0.00000%
8				Filtered Values	660	0.03940%
9	Avg Net Weight (Batch):	870.8				0.33342%
10	Net Weight By Head:					
11	871.2	870.3	872.7	870.7	870.0	869.4
12						
13	PFP1FH01.NetWt.PV	PFP1FH02.NetWt.PV	PFP1FH03.NetWt.PV	PFP1FH04.NetWt.PV	PFP1FH05.NetWt.PV	PFP1FH06.NetWt.PV
14	1645	1617	1649	1667	1667	1658
15	Filtered	Filtered	Filtered	Filtered	Filtered	Filtered
16	876.7999878	858.1999512	877.6000366	879.9000244	860.1000366	878.4000244
17	868.8000488	851.2000122	868.7000122	873	850.4000244	876.5
18	885.4000244	850.3000488	870.9000244	868.7999878	851.1000366	Filtered
19	Filtered	Filtered	Filtered	Filtered	Filtered	861
20	876.8999634	871	863.8999634	868.3000488	868.9000244	855.7999878
21	877.3000488	857.7000122	867.3999634	866.7999878	864.6000366	873.1999512
22	868.7000122	858.5	867.7999878	863.4000244	874.6000366	867.8999634
23	871.6000366	861.7000122	867.2999878	868.6000366	863	874.3999634
24	871.8999634	865	868.5	875.2999878	866.3000488	873.7000122
25	881.2000122	869.8999634	881.5	879.7999878	862.1999512	879.3999634
26	890.2000122	868.5	876.2999878	878.2999878	878.2999878	878.2000122
27	882.5	869.7999878	875.7999878	881.1999512	884.5999756	875.5999756
28	892.7000122	868.2000122	876.8999634	874.2999878	891	Filtered
29	Filtered	Filtered	Filtered	Filtered	Filtered	867.8999634
30	903	872.2999878	873	879.9000244	878.3999634	873.4000244
31	903.3999634	874.7000122	874	880.7999878	881.9000244	880.0999756
32	877.7999878	875.8000488	876.5	878.3999634	870.5	880.9000244

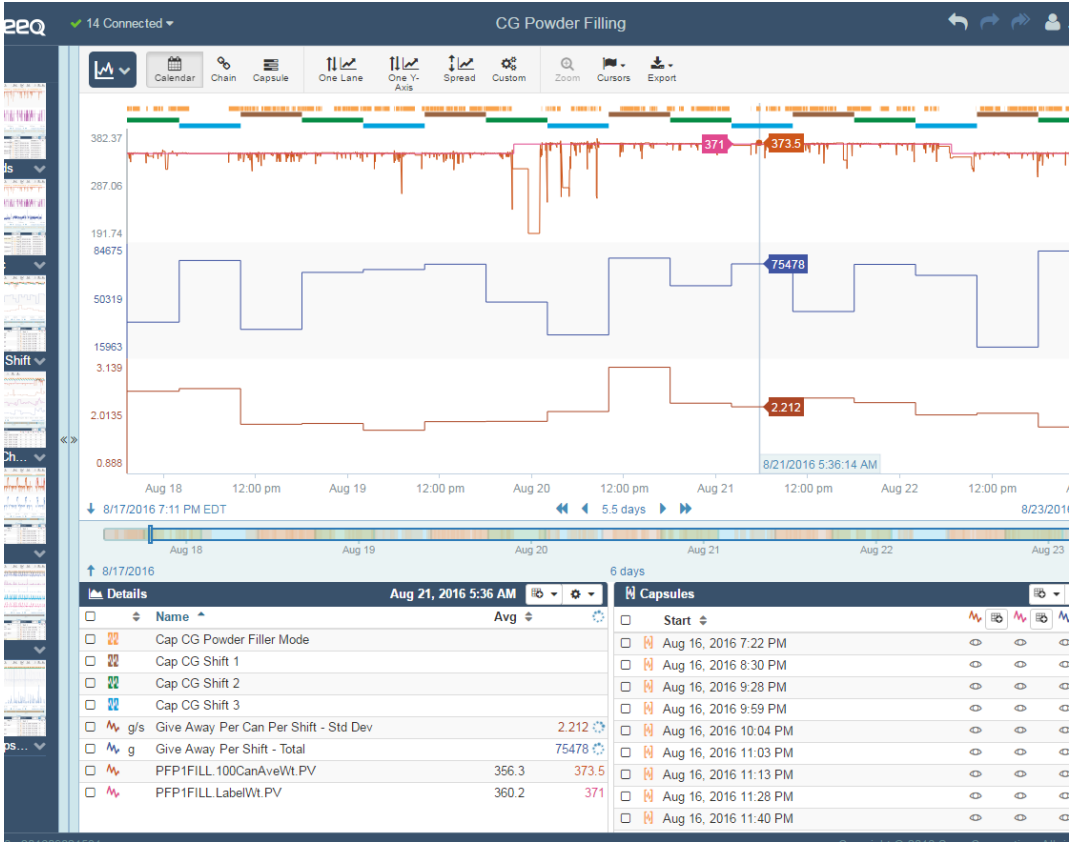
Accurately Identify Filling Periods

- Periods pulled from process data
- Performance analyses
  - Give-away
  - Variability analyses



Analytics

- Context created for
  - Products
  - Filler Mode
  - Shift
- Analyses
  - Loss per fill
  - Variability
  - Aggregate by
    - Product
    - Shift



Improve Net-weight Control and Reduce scrap

COMPANY and GOAL

Abbott Nutrition positively impacts the lives of ~19 Million people daily. Improved net-weight control and reduced scrap helps improve supply chain and controls costs.

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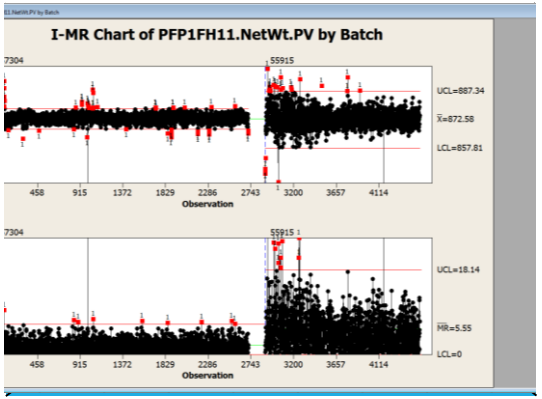


CHALLENGE

Measure accurately the fill variability. Validate that tighter control can be done while meeting minimum net-weight requirements

Many discrete measurements-–statistical approach is required

Analysis requires knowledge of target as a function of product

SOLUTION

Leverage PI System to acquire high speed packaging data, analyses, and reporting.

- Rapid access to all data
- Net-weight error calculations that vary by product; statistically analyzed
- Implement improved control approaches
- Continuously validate weight requirements are met

RESULTS

Identified and control variability of the filler equipment

- Set filling weight set point closer to the target
- Totalize give away amount across shifts to bring awareness.
- Continuous monitoring of filler head actual weight distribution for potential conditional based maintenance

Key OSIsoft Products and Services

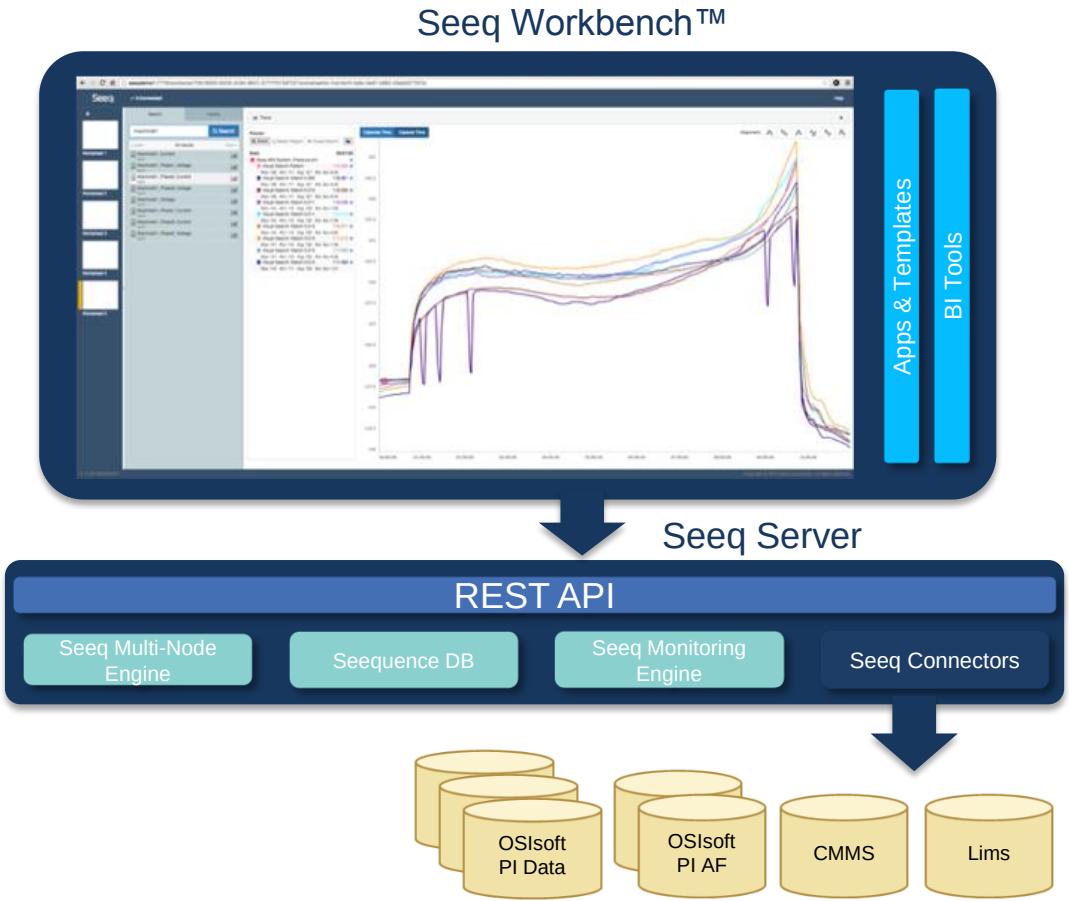
- Enterprise Agreement
  - Get *ALL* the data
  - Everyone has access including partners
  - Fast and broad deployment
- PI DataLink
  - Key for cycle and shift analyses
- PI Coresight
  - Seeq supports publish to PI Coresight
- PI Integrator for BA: BI Edition
  - Currently Evaluating

Seeq Products

- Innovative analytics
- Highly tuned to OSIsoft PI System
- Process engineer productivity app

Seeq Architecture

- Innovative analytics
- Highly tuned to PI System
- Engineer productivity app



Productivity Improvement Through Continuous Contextualization of PI System Data

COMPANY and GOAL

Abbott Nutrition is the #1 Nutrition Company Worldwide.

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Difficult to accurately identify slower process states that are adversely affecting production.
Validate over all lines and plants

CHALLENGE

Improve plant overall productivity through higher asset availability and less material waste.

SOLUTION

Leverage PI System data and unique Seeq analytics to pull process states from the data

- Rapid access to all data
- Quick model development and validation
- Implement improved control approaches
- Continuously validate effectiveness

RESULTS

Reduced process times while maintaining quality..

- Reduce non-value added time for data aggregation and analysis
- Improve asset utilization (CIP, Filler)
- Better visibility of equipment control and operation

Contact Information

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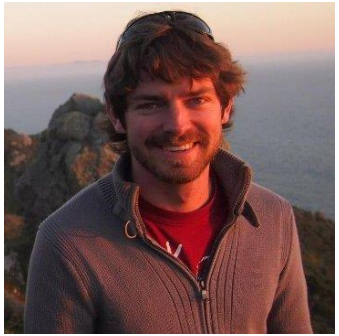

Questions

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

State your **name & company**

Please remember to…

Complete the Online Survey for this session

http://ddut.ch/osisoft

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谢谢

Danke

Gracias

Merci

Thank You

ありがとう

Спасибо

Obrigado