OSIsoft®

USERS CONFERENCE 2016

April 4-8, 2016 | San Francisco

TRANSFORM YOUR WORLD

Manufacturing Intelligence at Tyson Foods

Presented by **Jon Riechert**

Sr Engineer - Innovation

About Tyson

SALES (FISCAL YEAR 2015)

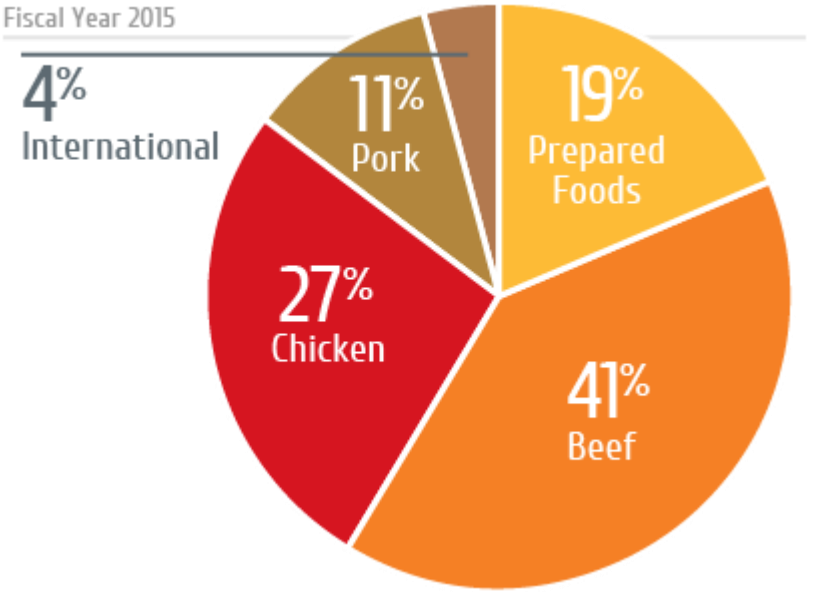
$40.6 Billion*

*Based on 52 weeks.

AVERAGE WEEKLY PRODUCTION (FISCAL YEAR 2015)

- **35,000,000** Head per Week
- **128,000** Head per Week
- **401,000** Head per Week
- **68,000,000** Pounds per Week

SALES BY SEGMENT
Fiscal Year 2015



About Jon Riechert

- Part of Corporate Engineering group – Prepared Foods
- Responsible for capital projects
- Innovation and new products
- Electrical Controls Standards
- Data Collection and Reporting

Applications

- 3 major applications
  - General plant reporting
  - Process monitoring and improvement
  - Food safety

Plant Reporting - Drivers

- Collect Process Data
- Distribute the data throughout the organization
- Enable continuous improvement
- See the status of the plant, in real time

Plant Reporting - Requirements

- Provide data collection and reporting capabilities
- Engage employees at all levels in optimizing operations
- Create useful KPIs to enable employees to make informed decisions
  - Plant Management
  - Zone Managers
  - Cell Operators

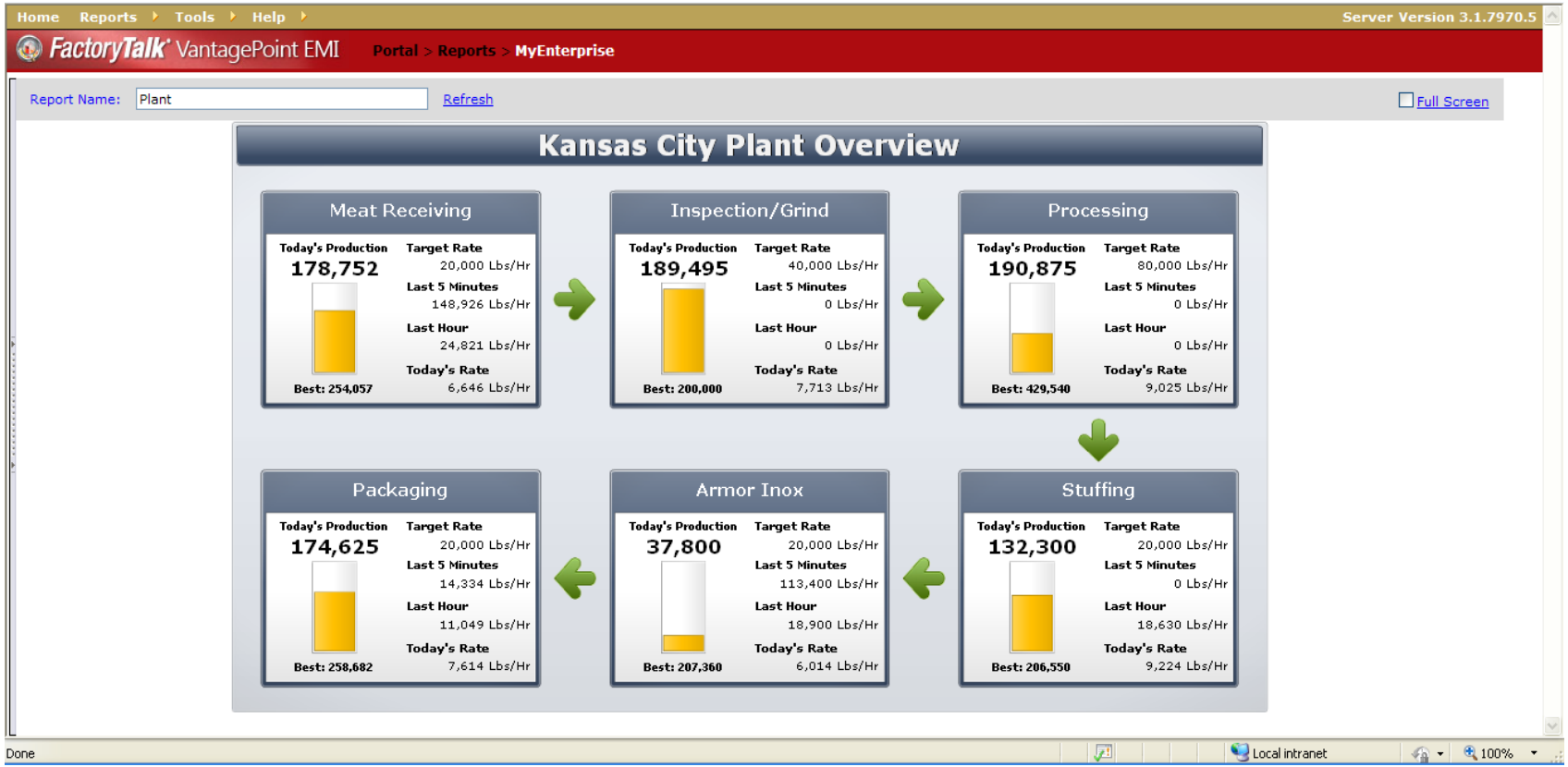
Solution Choice

- OSIsoft PI Server
- Rockwell FactoryTalk VantagePoint
- SQL
- Rockwell FactoryTalk Metrics

Reasons for Solution

- Liked the flexibility and scalability
  - Differing tag counts based on plant
  - Deployment options
- Ease of design
- Easy to use interface
- Most devices are Rockwell

Dashboard – Plant Overview



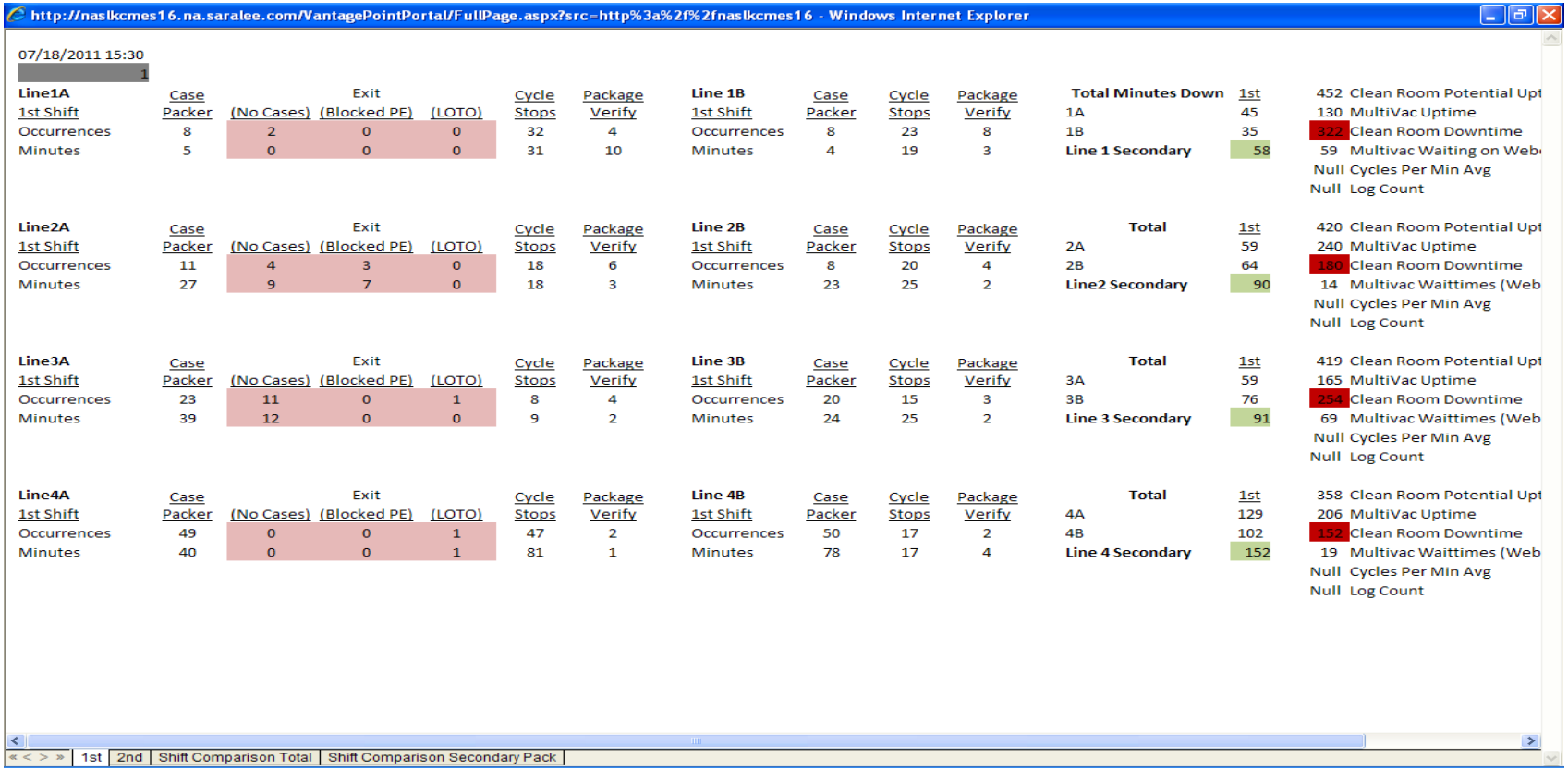
Dashboard – Department

Dashboard - Department

Benefit – Downtime Example

- Excessive downtime in packaging
- Added report to track line stoppages
  - Occurrences
  - Total time
- Identified which equipment was problem

Downtime Reporting



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1

Line1A	Case	Exit			Cycle	Package
1st Shift	Packer	(No Cases)	(Blocked PE)	(LOTO)	Stops	Verify
Occurrences	8	2	0	0	32	4
Minutes	5	0	0	0	31	10

Line 1B	Case	Cycle	Package
1st Shift	Packer	Stops	Verify
Occurrences	8	23	8
Minutes	4	19	3

Total Minutes Down	1st	
1A	45	130 MultiVac Uptime
1B	35	322 Clean Room Downtime
Line 1 Secondary	58	59 Multivac Waiting on Web
		Null Cycles Per Min Avg
		Null Log Count

Line2A	Case	Exit			Cycle	Package
1st Shift	Packer	(No Cases)	(Blocked PE)	(LOTO)	Stops	Verify
Occurrences	11	4	3	0	18	6
Minutes	27	9	7	0	18	3

Line 2B	Case	Cycle	Package
1st Shift	Packer	Stops	Verify
Occurrences	8	20	4
Minutes	23	25	2

Total	1st	
2A	59	240 MultiVac Uptime
2B	64	180 Clean Room Downtime
Line2 Secondary	90	14 Multivac Waittimes (Web
		Null Cycles Per Min Avg
		Null Log Count

Line3A	Case	Exit			Cycle	Package
1st Shift	Packer	(No Cases)	(Blocked PE)	(LOTO)	Stops	Verify
Occurrences	23	11	0	1	8	4
Minutes	39	12	0	0	9	2

Line 3B	Case	Cycle	Package
1st Shift	Packer	Stops	Verify
Occurrences	20	15	3
Minutes	24	25	2

Total	1st	
3A	59	165 MultiVac Uptime
3B	76	254 Clean Room Downtime
Line 3 Secondary	91	69 Multivac Waittimes (Web
		Null Cycles Per Min Avg
		Null Log Count

Line4A	Case	Exit			Cycle	Package
1st Shift	Packer	(No Cases)	(Blocked PE)	(LOTO)	Stops	Verify
Occurrences	49	0	0	1	47	2
Minutes	40	0	0	1	81	1

Line 4B	Case	Cycle	Package
1st Shift	Packer	Stops	Verify
Occurrences	50	17	2
Minutes	78	17	4

Total	1st	
4A	129	206 MultiVac Uptime
4B	102	152 Clean Room Downtime
Line 4 Secondary	152	19 Multivac Waittimes (Web
		Null Cycles Per Min Avg
		Null Log Count

Process Improvements

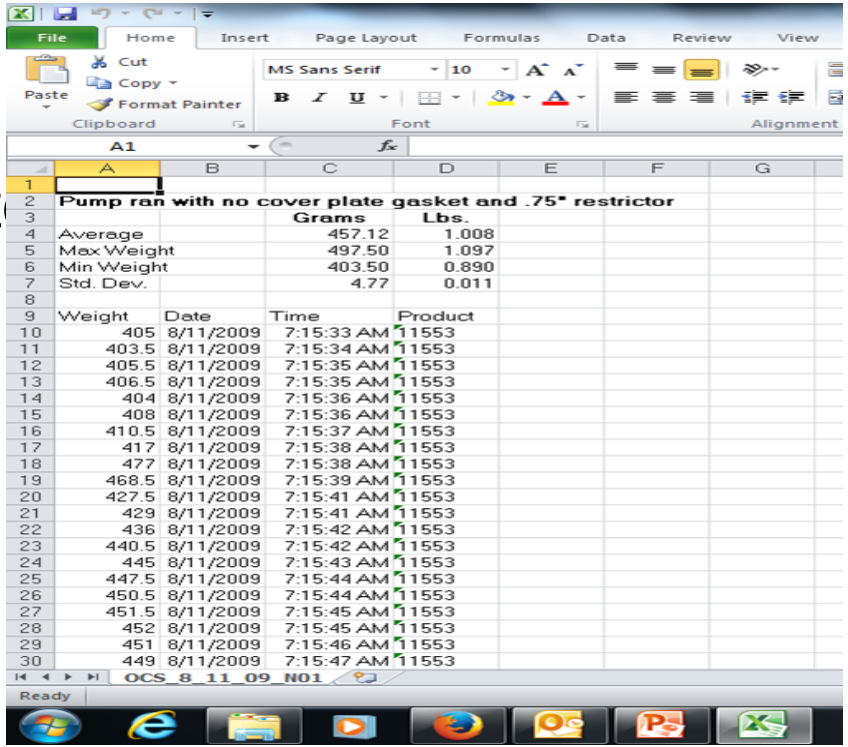
- Facility in Newbern, Tennessee
- Facility Information
  - Produces Jimmy Dean breakfast sausage
    - Rolls, links, and patties
- Project covered the 11 lines making roll sausage
- Impacted 105MM pounds of production
  - 150MM pounds for plant total

Process Improvements

- Improve control limits on package filling
- Reduce giveaway
- Automate quality recordkeeping

Previous Quality Reporting

- Run a batch file to pull data
- Receive list of all weights
- Manual intervention to calculat
- Each line done separately

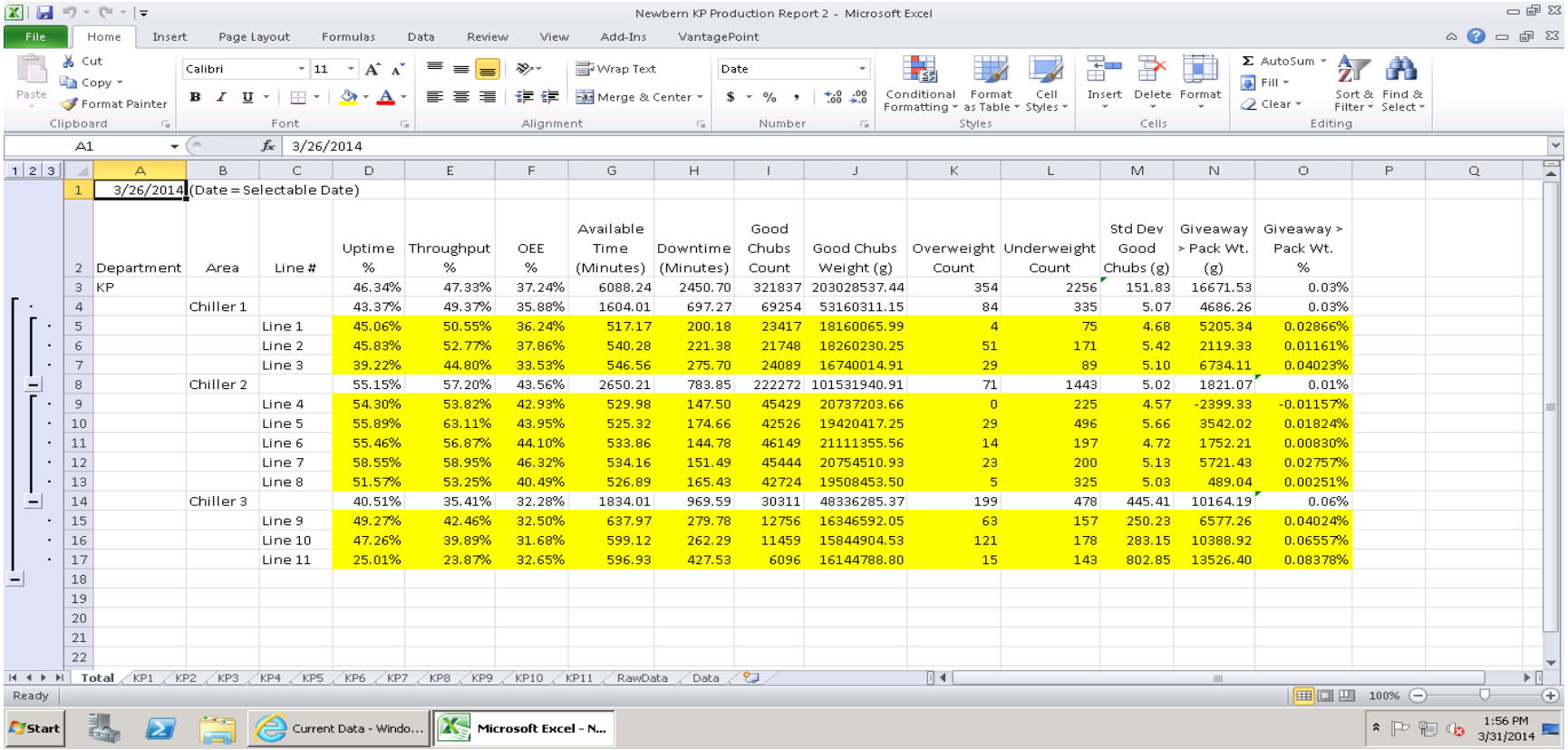


Pump ran with no cover plate gasket and .75" restrictor

	Grams	Lbs.
Average	457.12	1.008
Max Weight	497.50	1.097
Min Weight	403.50	0.890
Std. Dev.	4.77	0.011

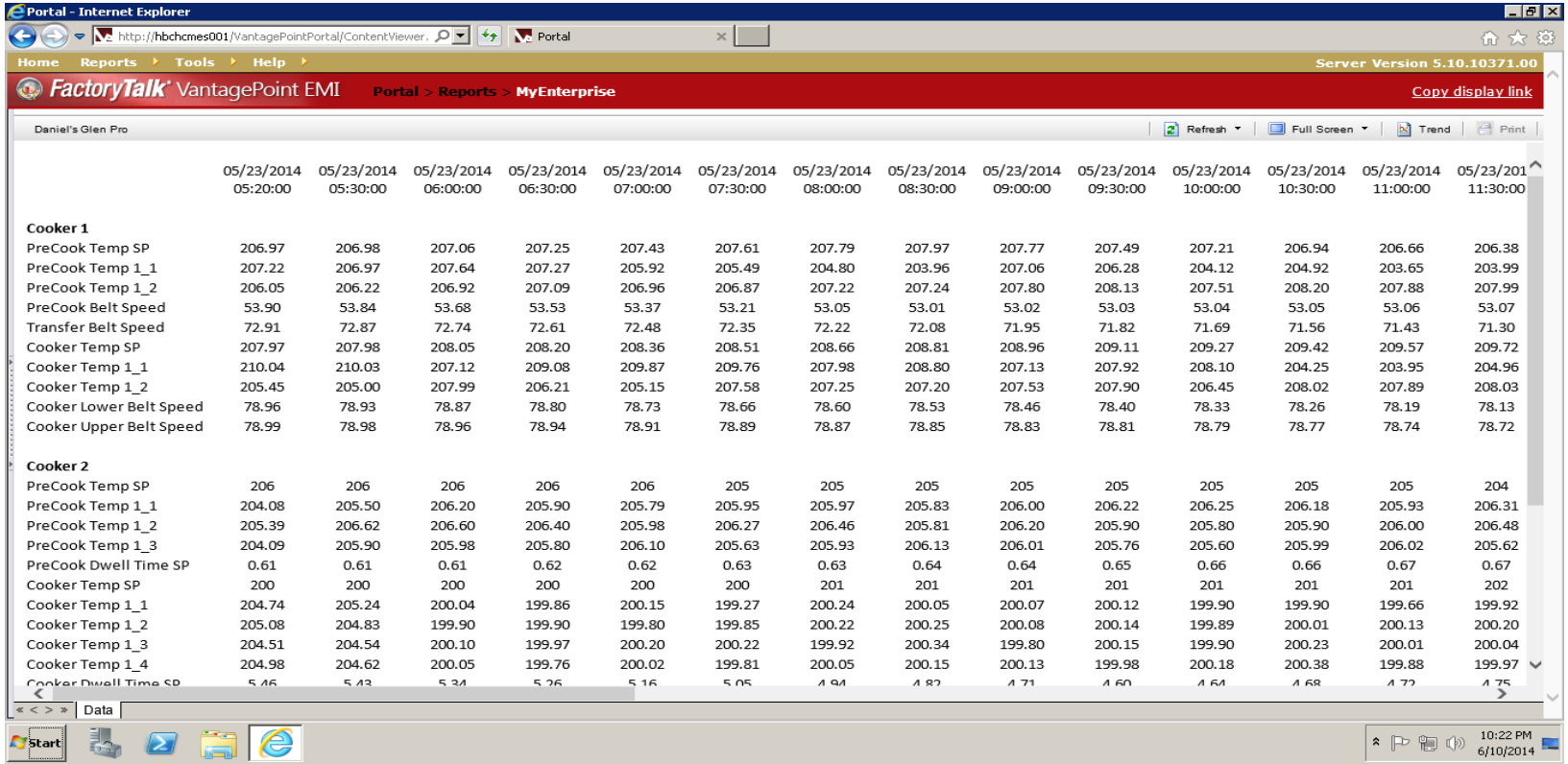
Weight	Date	Time	Product
405	8/11/2009	7:15:33 AM	11553
403.5	8/11/2009	7:15:34 AM	11553
405.5	8/11/2009	7:15:35 AM	11553
406.5	8/11/2009	7:15:35 AM	11553
404	8/11/2009	7:15:36 AM	11553
408	8/11/2009	7:15:36 AM	11553
410.5	8/11/2009	7:15:37 AM	11553
417	8/11/2009	7:15:38 AM	11553
477	8/11/2009	7:15:38 AM	11553
468.5	8/11/2009	7:15:39 AM	11553
427.5	8/11/2009	7:15:41 AM	11553
429	8/11/2009	7:15:41 AM	11553
436	8/11/2009	7:15:42 AM	11553
440.5	8/11/2009	7:15:42 AM	11553
445	8/11/2009	7:15:43 AM	11553
447.5	8/11/2009	7:15:44 AM	11553
450.5	8/11/2009	7:15:44 AM	11553
451.5	8/11/2009	7:15:45 AM	11553
452	8/11/2009	7:15:45 AM	11553
451	8/11/2009	7:15:46 AM	11553
449	8/11/2009	7:15:47 AM	11553

Process Improvement – Quality Reports



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	3/26/2014 (Date = Selectable Date)														
2	Department	Area	Line #	Uptime %	Throughput %	OEE %	Available Time (Minutes)	Downtime (Minutes)	Good Chubs Count	Good Chubs Weight (g)	Overweight Count	Underweight Count	Std Dev Good Chubs (g)	Giveaway > Pack Wt. (g)	Giveaway > Pack Wt. %
3	KP			46.34%	47.33%	37.24%	6088.24	2450.70	321837	203028537.44	354	2256	151.83	16671.53	0.03%
4		Chiller 1		43.37%	49.37%	35.88%	1604.01	697.27	69254	53160311.15	84	335	5.07	4686.26	0.03%
5			Line 1	45.06%	50.55%	36.24%	517.17	200.18	23417	18160065.99	4	75	4.68	5205.34	0.02866%
6			Line 2	45.83%	52.77%	37.86%	540.28	221.38	21748	18260230.25	51	171	5.42	2119.33	0.01161%
7			Line 3	39.22%	44.80%	33.53%	546.56	275.70	24089	16740014.91	29	89	5.10	6734.11	0.04023%
8		Chiller 2		55.15%	57.20%	43.56%	2650.21	783.85	222272	101531940.91	71	1443	5.02	1821.07	0.01%
9			Line 4	54.30%	53.82%	42.93%	529.98	147.50	45429	20737203.66	0	225	4.57	-2399.33	-0.01157%
10			Line 5	55.89%	63.11%	43.95%	525.32	174.66	42526	19420417.25	29	496	5.66	3542.02	0.01824%
11			Line 6	55.46%	56.87%	44.10%	533.86	144.78	46149	21111355.56	14	197	4.72	1752.21	0.00830%
12			Line 7	58.55%	58.95%	46.32%	534.16	151.49	45444	20754510.93	23	200	5.13	5721.43	0.02757%
13			Line 8	51.57%	53.25%	40.49%	526.89	165.43	42724	19508453.50	5	325	5.03	489.04	0.00251%
14		Chiller 3		40.51%	35.41%	32.28%	1834.01	969.59	30311	48336285.37	199	478	445.41	10164.19	0.06%
15			Line 9	49.27%	42.46%	32.50%	637.97	279.78	12756	16346592.05	63	157	250.23	6577.26	0.04024%
16			Line 10	47.26%	39.89%	31.68%	599.12	262.29	11459	15844904.53	121	178	283.15	10388.92	0.06557%
17			Line 11	25.01%	23.87%	32.65%	596.93	427.53	6096	16144788.80	15	143	802.85	13526.40	0.08378%
18															
19															
20															
21															
22															

Process Improvement – Quality Reports



Portal - Internet Explorer

http://hbchcmes001/VantagePointPortal/ContentViewer.

Portal

Home | Reports | Tools | Help

Server Version 5.10.10371.00

FactoryTalk VantagePoint EMI

Portal > Reports > MyEnterprise

Copy display link

Daniel's Glen Pro

Refresh | Full Screen | Trend | Print

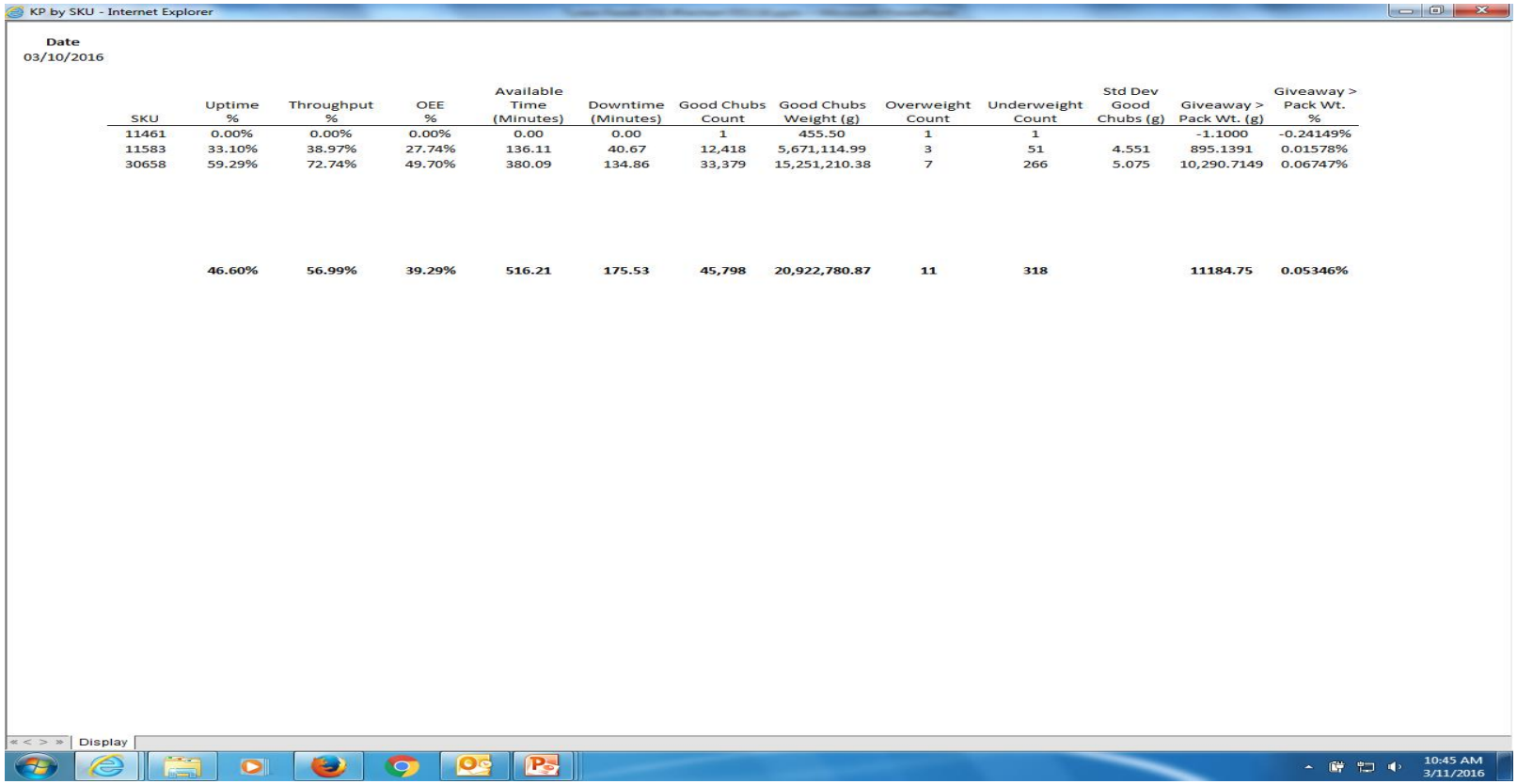
	05/23/2014 05:20:00	05/23/2014 05:30:00	05/23/2014 06:00:00	05/23/2014 06:30:00	05/23/2014 07:00:00	05/23/2014 07:30:00	05/23/2014 08:00:00	05/23/2014 08:30:00	05/23/2014 09:00:00	05/23/2014 09:30:00	05/23/2014 10:00:00	05/23/2014 10:30:00	05/23/2014 11:00:00	05/23/201 11:30:00
Cooker 1														
PreCook Temp SP	206.97	206.98	207.06	207.25	207.43	207.61	207.79	207.97	207.77	207.49	207.21	206.94	206.66	206.38
PreCook Temp 1_1	207.22	206.97	207.64	207.27	205.92	205.49	204.80	203.96	207.06	206.28	204.12	204.92	203.65	203.99
PreCook Temp 1_2	206.05	206.22	206.92	207.09	206.96	206.87	207.22	207.24	207.80	208.13	207.51	208.20	207.88	207.99
PreCook Belt Speed	53.90	53.84	53.68	53.53	53.37	53.21	53.05	53.01	53.02	53.03	53.04	53.05	53.06	53.07
Transfer Belt Speed	72.91	72.87	72.74	72.61	72.48	72.35	72.22	72.08	71.95	71.82	71.69	71.56	71.43	71.30
Cooker Temp SP	207.97	207.98	208.05	208.20	208.36	208.51	208.66	208.81	208.96	209.11	209.27	209.42	209.57	209.72
Cooker Temp 1_1	210.04	210.03	207.12	209.08	209.87	209.76	207.98	208.80	207.13	207.92	208.10	204.25	203.95	204.96
Cooker Temp 1_2	205.45	205.00	207.99	206.21	205.15	207.58	207.25	207.20	207.53	207.90	206.45	208.02	207.89	208.03
Cooker Lower Belt Speed	78.96	78.93	78.87	78.80	78.73	78.66	78.60	78.53	78.46	78.40	78.33	78.26	78.19	78.13
Cooker Upper Belt Speed	78.99	78.98	78.96	78.94	78.91	78.89	78.87	78.85	78.83	78.81	78.79	78.77	78.74	78.72
Cooker 2														
PreCook Temp SP	206	206	206	206	206	205	205	205	205	205	205	205	205	204
PreCook Temp 1_1	204.08	205.50	206.20	205.90	205.79	205.95	205.97	205.83	206.00	206.22	206.25	206.18	205.93	206.31
PreCook Temp 1_2	205.39	206.62	206.60	206.40	205.98	206.27	206.46	205.81	206.20	205.90	205.80	205.90	206.00	206.48
PreCook Temp 1_3	204.09	205.90	205.98	205.80	206.10	205.63	205.93	206.13	206.01	205.76	205.60	205.99	206.02	205.62
PreCook Dwell Time SP	0.61	0.61	0.61	0.62	0.62	0.63	0.63	0.64	0.64	0.65	0.66	0.66	0.67	0.67
Cooker Temp SP	200	200	200	200	200	200	201	201	201	201	201	201	201	202
Cooker Temp 1_1	204.74	205.24	200.04	199.86	200.15	199.27	200.24	200.05	200.07	200.12	199.90	199.90	199.66	199.92
Cooker Temp 1_2	205.08	204.83	199.90	199.90	199.80	199.85	200.22	200.25	200.08	200.14	199.89	200.01	200.13	200.20
Cooker Temp 1_3	204.51	204.54	200.10	199.97	200.20	200.22	199.92	200.34	199.80	200.15	199.90	200.23	200.01	200.04
Cooker Temp 1_4	204.98	204.62	200.05	199.76	200.02	199.81	200.05	200.15	200.13	199.98	200.18	200.38	199.88	199.97
Cooker Dwell Time SP	5.46	5.43	5.34	5.26	5.16	5.05	4.94	4.82	4.71	4.60	4.64	4.68	4.72	4.75

Data

Start

10:22 PM 6/10/2014

Process Improvement – Quality Reports



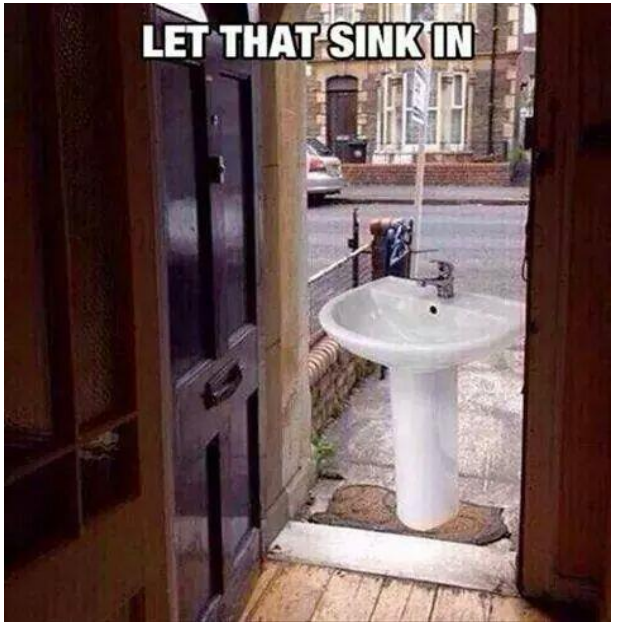
SKU	Uptime %	Throughput %	OEE %	Available Time (Minutes)	Downtime (Minutes)	Good Chubs Count	Good Chubs Weight (g)	Overweight Count	Underweight Count	Std Dev Good Chubs (g)	Giveaway > Pack Wt. (g)	Giveaway > Pack Wt. %
11461	0.00%	0.00%	0.00%	0.00	0.00	1	455.50	1	1		-1.1000	-0.24149%
11583	33.10%	38.97%	27.74%	136.11	40.67	12,418	5,671,114.99	3	51	4.551	895.1391	0.01578%
30658	59.29%	72.74%	49.70%	380.09	134.86	33,379	15,251,210.38	7	266	5.075	10,290.7149	0.06747%
	46.60%	**56.99%**	**39.29%**	**516.21**	**175.53**	**45,798**	**20,922,780.87**	**11**	**318**		**11184.75**	**0.05346%**

Food Safety Example

- Issue with cooking sausage to proper temperature
- Able to use FactoryTalk® Historian and FactoryTalk VantagePoint to identify issue

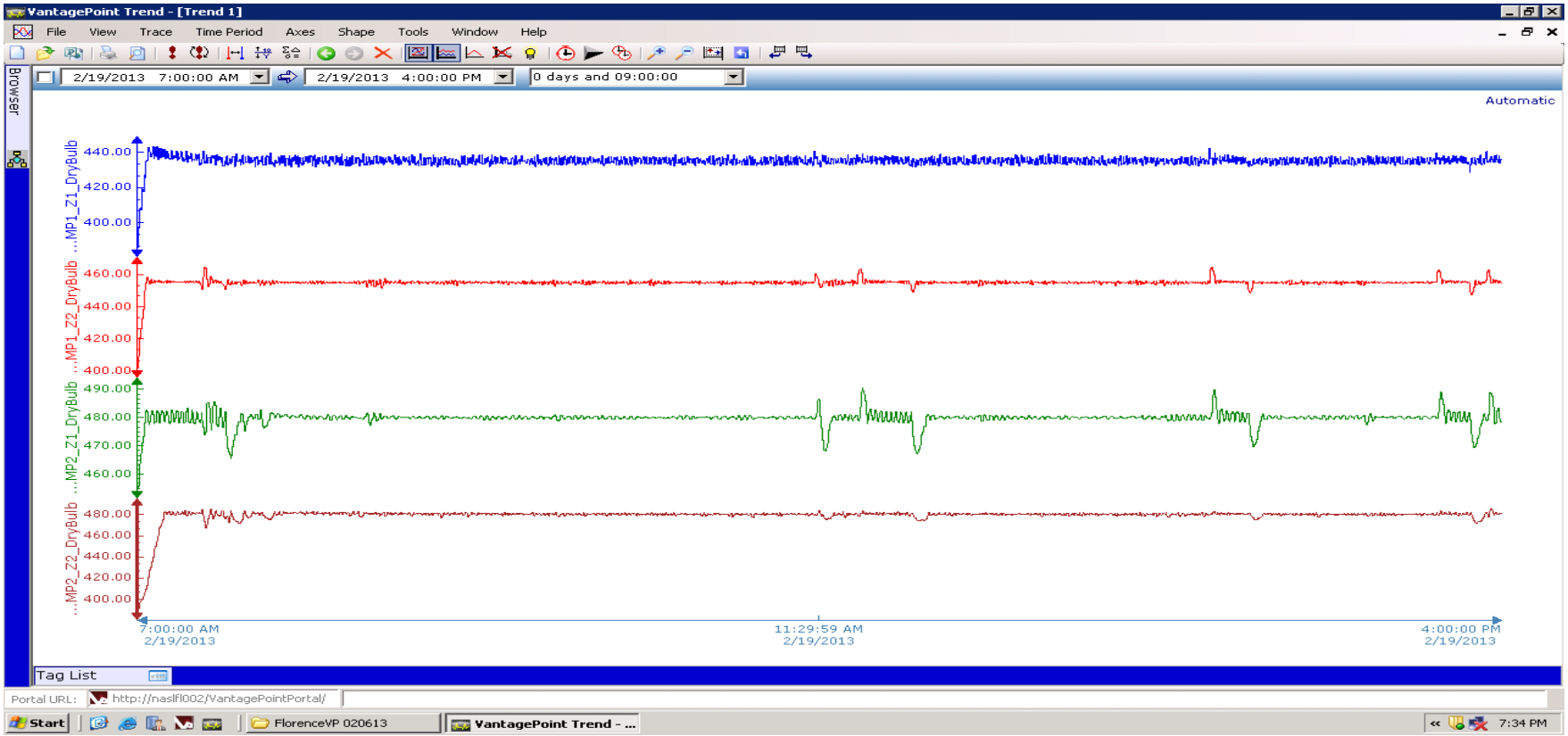
How Bad Can It Be?

- Average Cost of a Recall is > $30 Million[1]
- Egg Recall in 2010
  - 500 million eggs
  - $100 Million lost to drop in egg prices
- Peanut Butter and Salmonella
  - 2007 - $78 Million
  - 2009 - $1 Billion

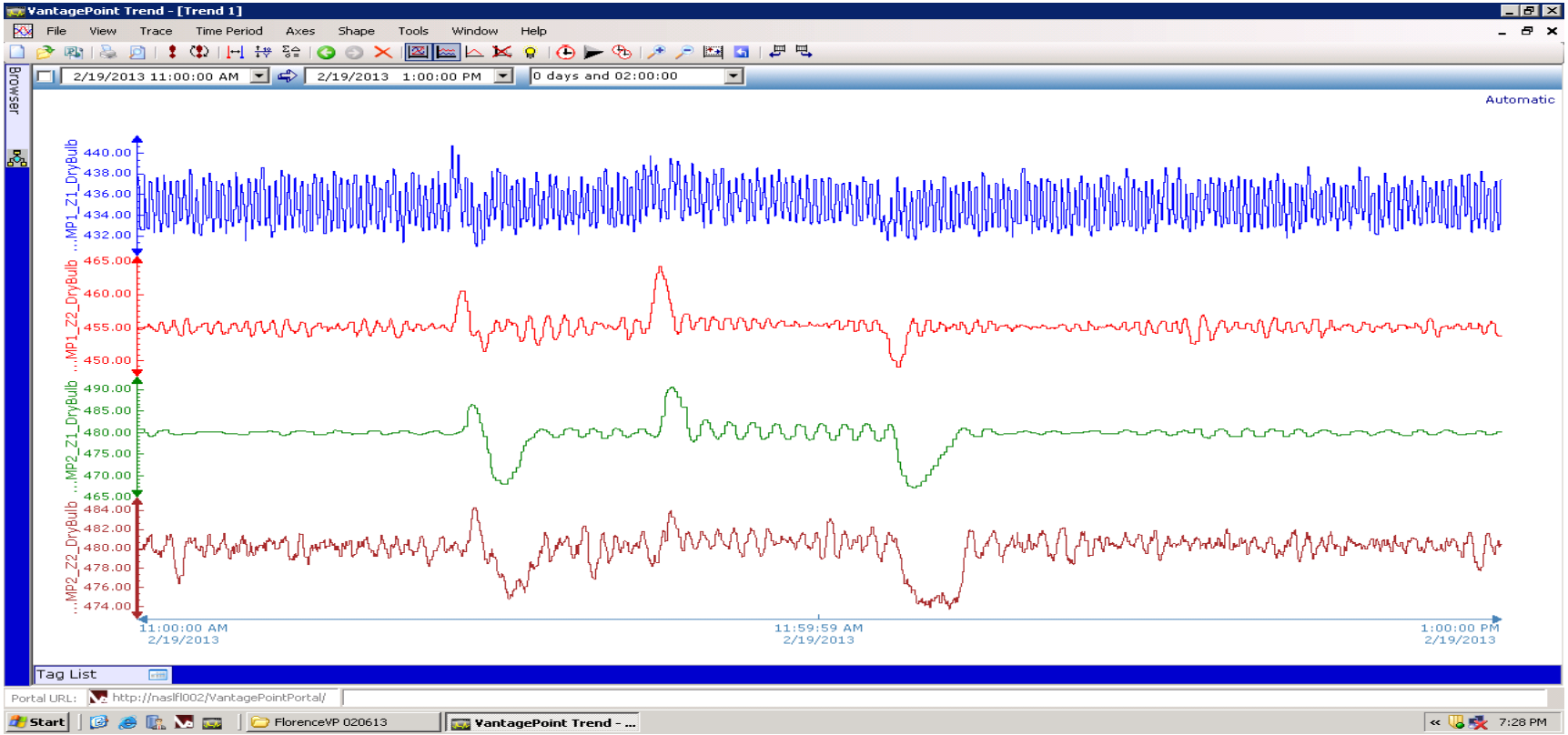


1. Ernst & Young, Capturing Recall Costs, Measuring and Recovering the Losses, 2010

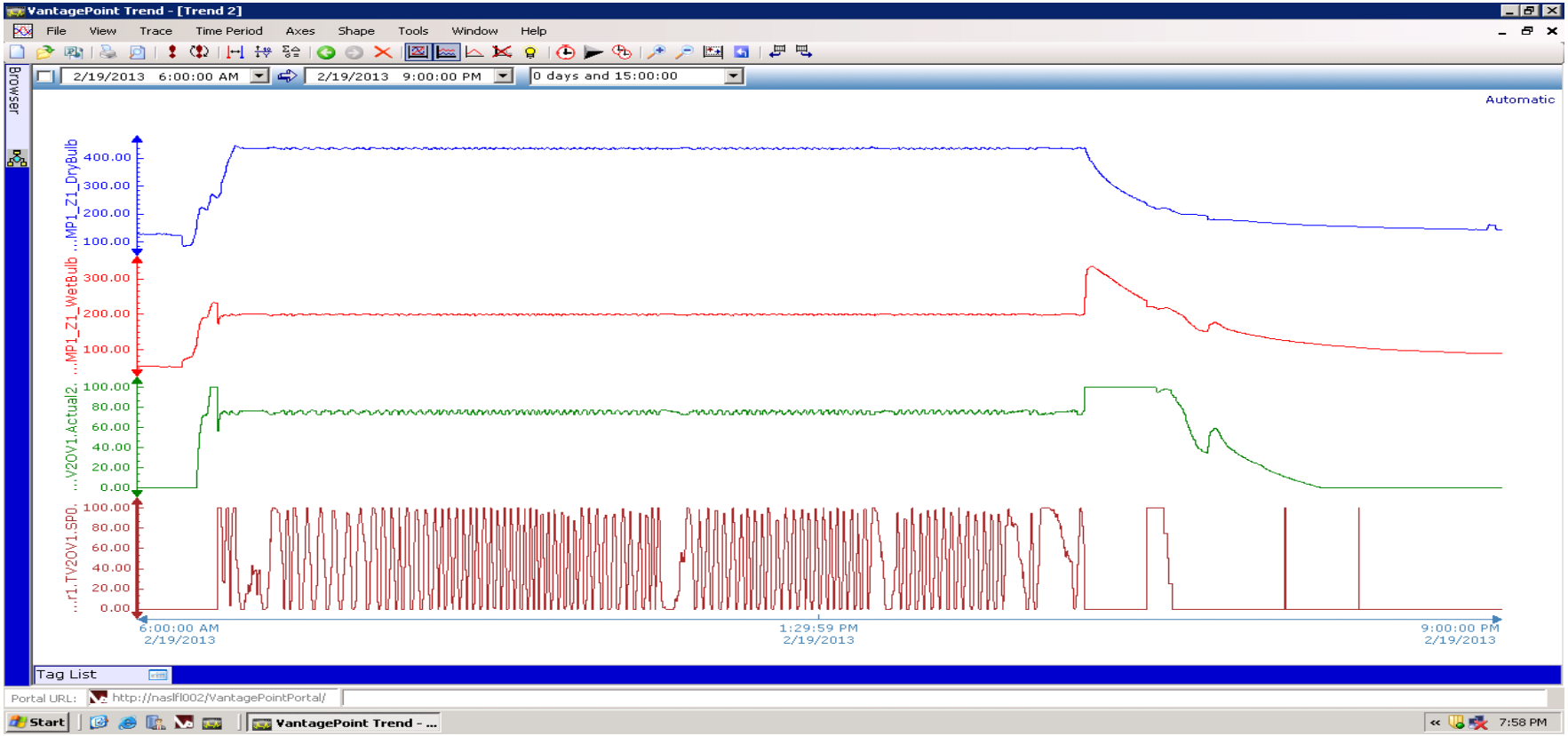
Food Safety Example



Food Safety Example



Food Safety Example



Benefits - Production

- 0.1% Overall yield improvement
- Waste reduction:
  - Tightened control limits
  - Increased giveaway to reduce waste
  - Waste more expensive
  - Was counterintuitive
- Saved 8 man hours daily in QA reporting
- Corn dog facility cut waste in half saving 1MM pounds of production

0.1% overall yield improvement on 105MM pounds of production

Benefits – Food Safety

- See the interaction of process variables live and over time
- Can be alerted to processes that are out of control
- Recipe and settings verification
- Brand protection
  - Cost avoidance of QA hold or recall
  - Acts like an insurance policy

Food Safety impacts your brand equity

Contact Information

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Tyson Foods

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

감사합니다

谢谢

Danke

Gracias

Merci

Thank You

ありがとう

Спасибо

Obrigado


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USERS CONFERENCE 2016
April 4-8, 2016 | San Francisco
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YOUR WORLD