

# Batch and Event Frames

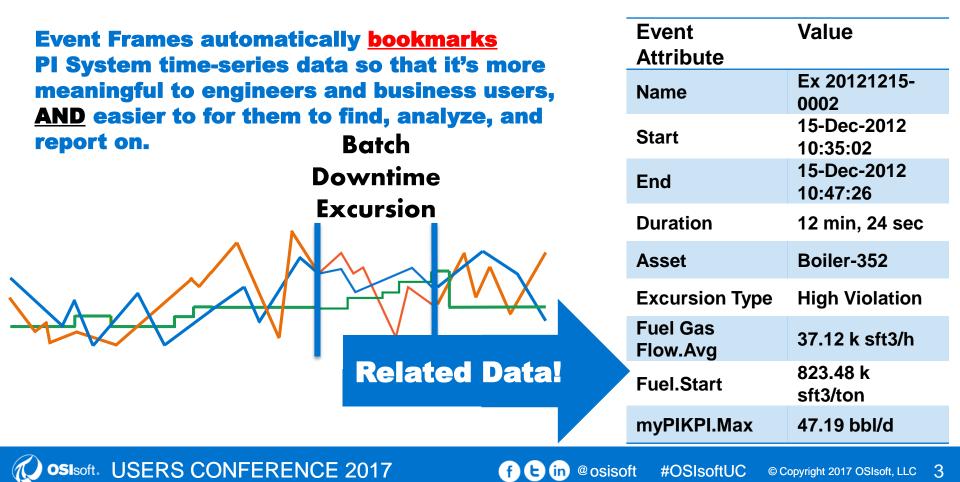
Presented by David Casazza, David Spiese and Bethanne Peters





#### 2017 – The Green Light year for Batch Customers 2011 Asset Framework & Event Frames Batch Interfaces 2012 to Event Frames **PI** Integrator for **PI** Datalink **Business Analytics** 2014PI Vision **PI Batch Migration to Event Frames Pinned Events PI System Connector PI** Coresight **RtReports 4.0 Overlay Trends USERS CONFERENCE 2017** @osisoft **#OSIsoftUC** © Copyright 2017 OSIsoft, LLC 2

#### **Event Frames**



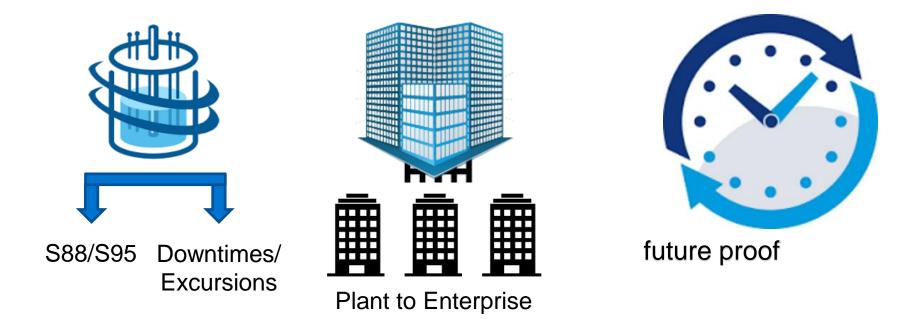
#### Why Event Frames for Batch Customers?





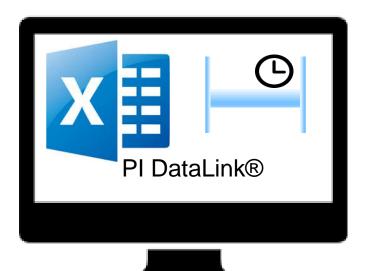


#### **Why Event Frames for Batch Customers?**

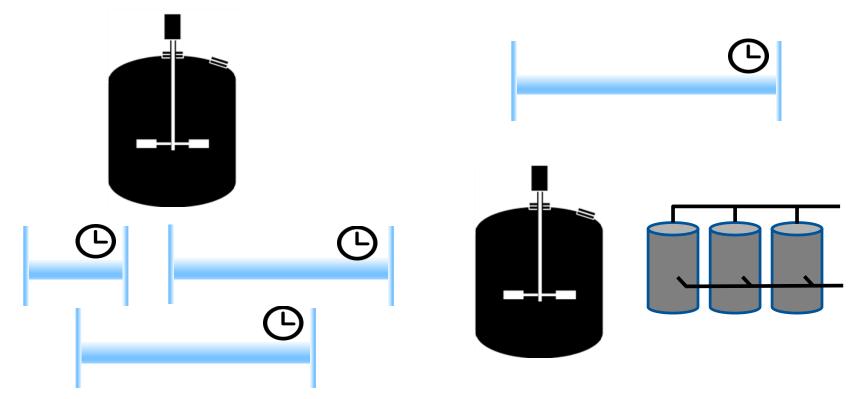














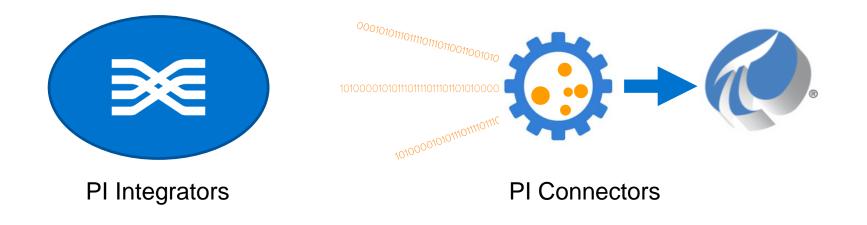
















#### **Advantages Summary**



## Modern web visualization

#### Move forward to better capabilities

## Scale to the Enterprise

(E)

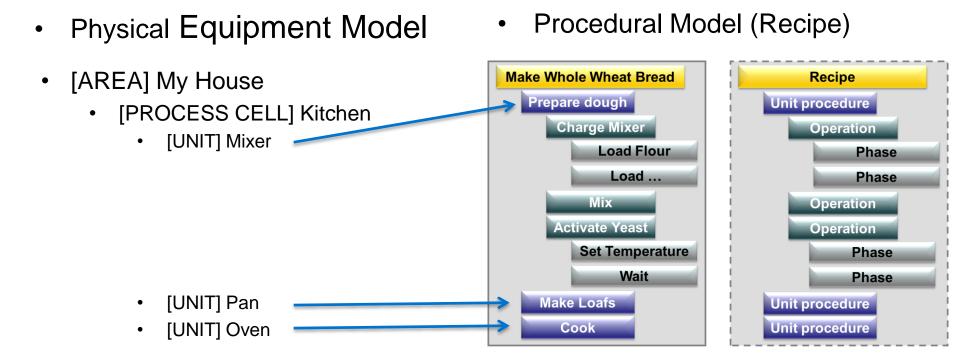
(in)

#### Focus across the Enterprise



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#### **Event Frames and Batch Interfaces Use S88 Model**





#### **PI Analytics vs. Batch Interfaces**

Display: Click Save Icon*	BatchDemo_HCL2_LCL2_wmurdock2
Gearbox Temperature (°C) ×	● CIP SUPPLY TEMPERATURE (°C) × 「 <sup>90</sup>
62	-80
	-70
-53	
-56	
-54	Batch Interfaces – Event Frame
PI Analytics – Simple Event Frames	Hierarchy Matching Batch Events
Vən i.un i.ən 2.un	
GE01 2017-02-22 09:02:16	+ UP_CIPSKID_CHEMCIP_LINE:1_HCL2
♦ GE012017-02-2121:51:01	+ ♦ UP_CIPSKID_CHEMCIP_LINE:1_LCL2
GE01 2017-02-21 17:23:15	UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_201591113913)
▲ GE01 2017-02-20 17:46:16	+ OP_CIPSKID_LINERINSE:1 + OP_CIPSKID_RINSE:1
▼ GE01 2017-02-20 06:08:16	+ OP_CIPSKID_WASH:1
O GE01 2017-02-17 16:16:16	+ OP_CIPSKID_WASH2 + OP_CIPSKID_RINSE2
♦ GE01 2017-02-17 09:11:16	+ OP_CIPSKID_FINALRINSE:1
GE01 2017-02-12 00:36:46	VP_CIPSKID_CHEMCIP_LINE:1 (OSIsof_201591111631)
△ GE012017-02-11 14:56:30	+ OP_CIPSKID_LINERINSE:1 + OP_CIPSKID_RINSE:1
▼ GE01 2017-02-11 02:01:01	+ OP_CIPSKID_WASH:1 + OP_CIPSKID_WASH:2
# GE012017-02-09 18:36:15	+ OP_CIPSKID_WASH2 + OP_CIPSKID_RINSE 2
	+ OP_CIPSKID_FINALRINSE:1
	+ VUP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_2015873586)



#### **Batch Visualization PI Vision features**

## **Overlay Trends**

- Compare parameters across batches
- Add/remove process parameters

- History review
- Evaluate process performance

<t



#### **Batch Visualization PI Vision features**

## **Pinned Events**

- Compare batches to reference
- · Save reference batches in displays

• View process data and "ideal" data on same trends

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- Investigate outliers
- Prepare for batch release



#### **Batch Visualization PI Vision features**



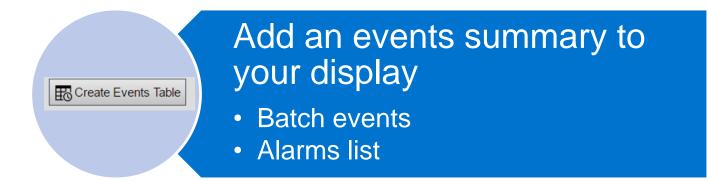
- Compare batches across units
- Different batch templates
- Custom time scales
- Facilitate tech transfer
- View batches across life cycle
   Development → scale-up → commercialization

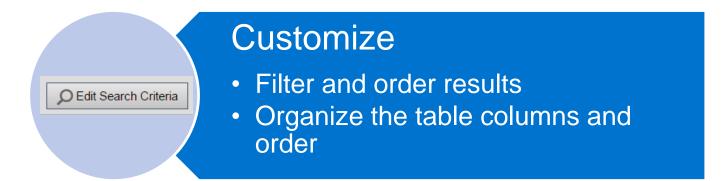
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#### **Events Table**





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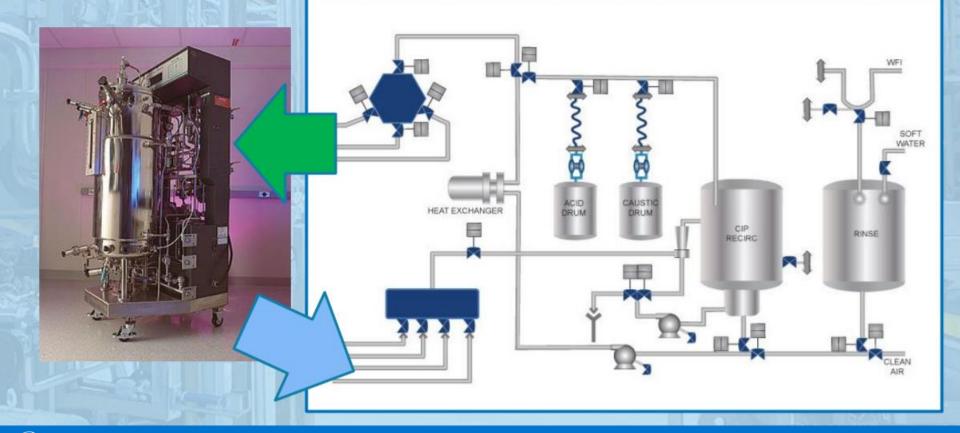








## **Clean in Place - CIP**

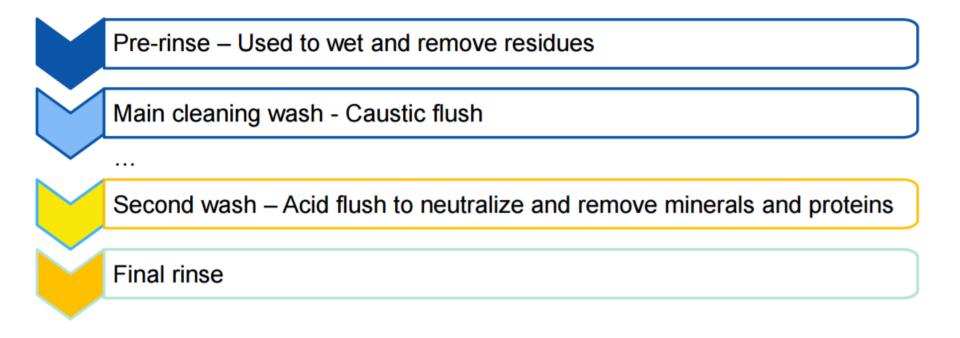


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#### **CIP – Clean In Place Process**



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#### **Improve Process Intelligence**

• CIP takes a large amount of chemical supply and energy

- Operators want to ensure protocols are followed with real time displays
- Process Engineers want to improve performance by comparing KPIs to ideal
- Executives want performance summary reports to monitor time and cost

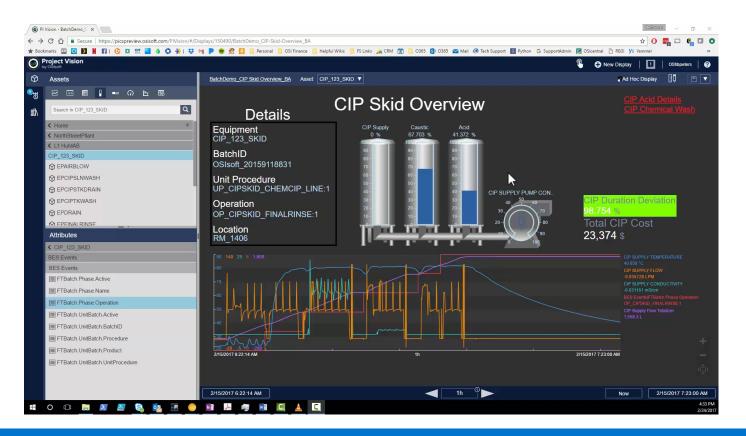
#### **Build a Display with Live Data**

"I need to be able to see that the operation is following protocol."





#### **Demo: Building Display with Live Data**



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#### What did we demonstrate?

- Easy creation of real time display
- Monitor key parameters
- Show results for analytics for economic indicators (cost)

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• Show results for analytics for deviations in duration



### **Applying Event Frame Context**



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#### "I need to see data from recent CIP events."

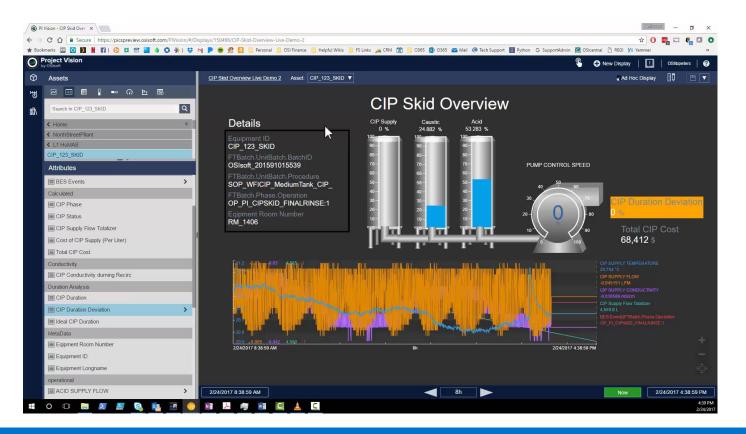
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### **Demo: Applying Event Frame Context**



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#### What did we demonstrate?

- See related events (batches) for an asset
- Create Events Table (Community Technology Preview)

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- Batch Events
- Non-Batch Events (Alarms, Downtime, etc.)



#### **Pinned Events for Quality Control**

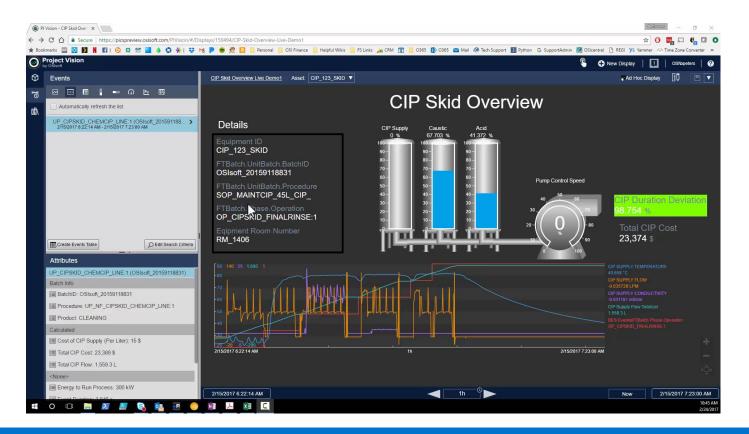
"I need to compare events to the ideal curve to report on quality control."







#### **Demo: Pinned Events for Quality Control**





### What did we demonstrate?

- Launch into event overlay comparison with easy parameter cleanup
- Pinned Events
  - View process data and ideal data on same trends
- Find and compare events
- Find extra long durations that show:
  - excess energy and materials costs
  - reduced OEE and turnaround

#### **Statistical Process Control Curves**

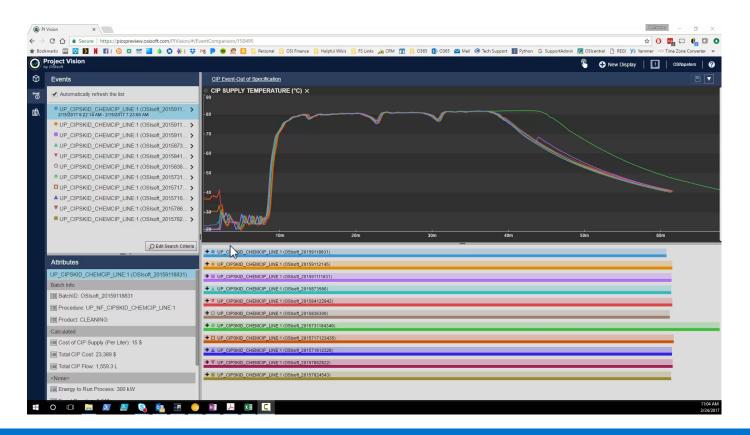
# "I want to find opportunities to improve performance."







#### **Demo: Statistical Process Control Curves**

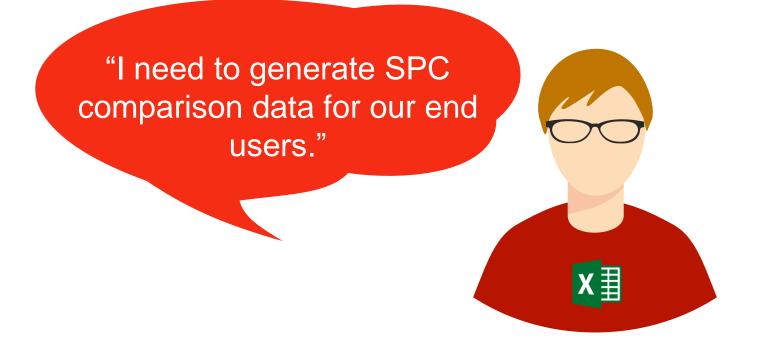




### What did we demonstrate?

- Greater Searchabilitity
  - View batches across life cycle
  - Find events related to multiple assets
- Pinned statistical data
- Compare events to statistical data
- Find KPIs that are deviating

#### **Building Statistical Data**







#### **Building Statistical Data**

Gather Reference Event Data (PI DataLink)

#### Calculate Statistics

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Publish Virtual Data and Events (piconfig and PI Builder)

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### **Use PI DataLink to Query Events**

A2 • : $f_x$ {=PIEFDat("\\dfpiaf\osipharmacip","12/21/2016","2/16/2017",0,"*chemcip						
- 2	Α	В	C	Events		
1						
2	Event name	Child 1	Start time	End time		
3	UP_CIPSKID_CHEMCIP_LINE:1		21-Dec-16 13:20:39	21-Dec-16 14:22:32		
4	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_LINERINSE:1	21-Dec-16 13:20:39	21-Dec-16 13:28:19		
5	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_RINSE:1	21-Dec-16 13:28:19	21-Dec-16 13:34:09		
6	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_WASH:1	21-Dec-16 13:34:09	21-Dec-16 13:43:23		
7	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_WASH:2	21-Dec-16 13:43:23	21-Dec-16 13:51:33		
8	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_RINSE:2	21-Dec-16 13:51:33	21-Dec-16 13:54:56		
9	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_FINALRINSE:1	21-Dec-16 13:54:56	21-Dec-16 14:22:32		
10	UP_CIPSKID_CHEMCIP_LINE:1		21-Dec-16 13:28:32	21-Dec-16 14:29:54		
11	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_LINERINSE:1	21-Dec	49		
12	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_RINSE:1	21-Dec Refere	nce Events 39		
13	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_WASH:1	21-Dec	.52		
14	UP_CIPSKID_CHEMCIP_LINE:1	OP_CIPSKID_WASH:2	21-Dec-16 13:50:52	21-Dec-16 13:58:57		

\_\_\_\_

Use PI DataLink to Query PI Point Data					
	_124_SKID_TI031.pv 21-Dec-2016 13:20:39 21-Dec-2016 14:22:32		CIP_123_SKID_TI031.pv 21-Dec-2016 13:28:32 21-Dec-2016 14:29:54		Compressed Sampled Timed Data ▼ Data ▼ Data Multiple Value
CIP_124_SKID 10s		CIP_123_SKII 10s	D	CIP 10s	_123_SKID
	20.83270073		21.29899406		21.97
	20.83155823		21.29720879	1	21.97
	20.83041382 20.82927132		21.29542542 21.29364014		21.98
	20.82812691		21.29185486		21.99
	20.8269825		21.29319382		22.01
	20.82584		21.32263947		22.13
	20.82798386 20.83779716		21.32263756		22.21
	20.84118271		21.3261 R	efe	rence Event Data
	20.83813667		21.33736038		22.22

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## Calculate Average, Standard Deviation and Control Limits`

Average 1	StDev 1	LCL1 1	LCL2 1	HCL1 1	HCL2 1
24.65470	6.66893	17.98577	11.31684	31.32363	37.99257
24.63519	6.62944	18.00576	11.37632	31.26463	37.89407
24 61578	6 59298	18 02280	11.42982	31.20875	37.80173
24.59559	6.55146	18.04413	11.49267	31.14705	37.69851
24.57758	6.51208	18.06550	11.55342	31.08966	37.60174
24.60024	6.51406	18.08618	11.57211	31.11430	37.62837
24.76740	6.74148	18.02592	11.28444	31.50887	38.25035
24.85739	6.87830	17.97909	11.10080	31.73568	38.61398
24.85345	6.85885	17.99460	11.13575	31.71230	38.57115
24.81738	6.79393	18.02345	11.22952	31.61131	38.40525
24.78818	6.71369	18.07449	11.36080		
04.00267	6 70740	40.44605	44,00000	Calculat	ed Statistics

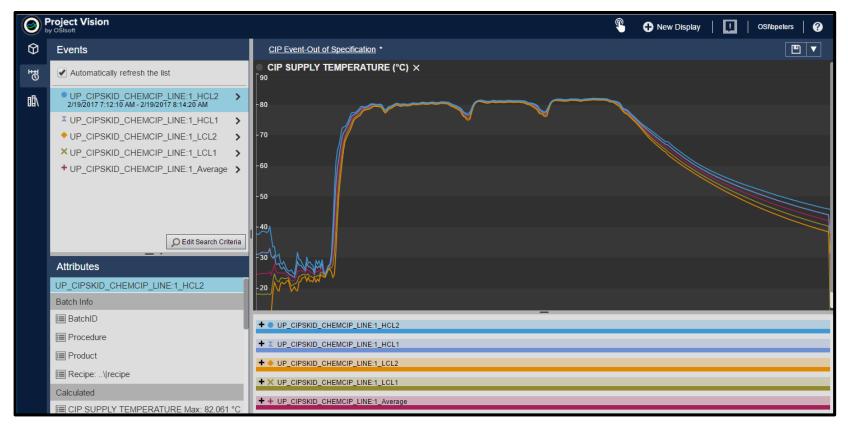


#### **Data Required to Build Virtual Events**

	CIP_ControlLimitsData.txt - Notepad			
File Edit Format View Help				
Tag,Time,Value				
CIP_000_SKID_TI031.	<u> V,19-Feb-2017 00</u>	:01:00,24.654702292	5483	
CIP_000_SKID_TI031.	🚺 🖯 🏷 🖓 🖬 🖬			Copy of EFSToCreate.xlsx - Excel
CIP_000_SKID_TI031.F	FILE HOME INSERT	PAGE LAYOUT FORMULAS DATA	REVIEW VIEW DEVELOPER PI DATAL	INK PI BUILDER POWERPIVOT
CIP 000 SKID TI031.	Data Server: 🖀 DFPIServer1 -	(x) Select All	🎽 👫 💻 🖳 Show	v Values in Rows 🔛 Headers 🚯 About
CIP_000_SKID_TI031.F		Deselect All	inter Liberry Flammater Frank Defrack	v Values in Columns 📰 Settings 🕜 Help
CIP 000 SKID TI031.F	Database: 🔕 OSIPharmaCIP 🔻	Reset to Template	oints Library Elements Event Refresh	✓ Errors
CIP 000 SKID TI031.	Connections	Build 🕞	Retrieve 🕞 Attribu	te Data References Resources
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	2 X		UP_CIPSKID_CHEMCIP_LINE:1_/	0
CIP_000_SKID_TI031.		[UP_CIPSKID_CHEMCIP_LINE:1_Av	· · · ·	EventFrame PISubBatchMigrated_L1 Phan
CIP 000 SKID TI031.		[UP_CIPSKID_CHEMCIP_LINE:1_Av		EventFrame Rinse Phan
CIP_000_SKID_TI031.F		[UP_CIPSKID_CHEMCIP_LINE:1_Av [UP_CIPSKID_CHEMCIP_LINE:1_Av	• • •	EventFrame Wash Operation Phan EventFrame Wash Operation Phan
		UP CIPSKID CHEMCIP LINE:1 AV	• •	EventFrame Rinse Phan
CIP_000_SKID_TI031.F	- v EventEremee	UP CIPSKID CHEMCIP LINE:1 AV	• • •	EventFrame Final Rinse Phan
CIP_000_SKID_TI031.	9 X	[	UP CIPSKID CHEMCIP LINE:1	
	10 x EventFrames	UP CIPSKID CHEMCIP LINE:1 LC		EventFrame PISubBatchMigrated L1 Phan
	11 x EventFrames	UP_CIPSKID_CHEMCIP_LINE:1_LC	L1] OP_CIPSKID_RINSE:1	EventFrame Rinse Phan
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		[UP_CIPSKID_CHEMCIP_LINE:1_LC		Virtual Events
		[UP_CIPSKID_CHEMCIP_LINE:1_LC		
		[UP_CIPSKID_CHEMCIP_LINE:1_LC		Phan
	16 X			LCL2 EventFrame Unit Procedure CIP Phan

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#### **SPC Curves in PI Vision**



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#### What did we demonstrate?

- Gathered reference event data using PI DataLink
- Use Excel to calculate statistics
- Write statistical data to PI Points and associate data with virtual units and Event Frames

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#### **Gain Management Insights using a Dashboard**







#### Use PI Datalink, Excel and PowerPivot to Create Dashboard

В	C D	E		F			_	G	Н	1	J
Operational Analysis							OPERATIO	ON DURATIO	ON		
operational Analysis			OP CIPSKID WASH:2 OP CIPSKID WASH:1 OP CIPSKID RINSE:2								
OPERATION	DURATION	Operation	*		CIPSKID_RI		and a second sec		1 OP_CIPSKID_FI		
13%	OP CIPSKID WASH:2	OP_CIPSKID_F	NALRINSE:1	2/14/2017 21:32	08:05	09:09	03:20 05:36	07:49	27:31		
13%		OP_CIPSKID_L	NERINSE:1	2/14/2017 20:32	08:11	09:17	03:24 05:45	07:33	27:37		
	OP_CIPSKID_WASH:1	OP_CIPSKID_R	INSE:1	2/14/2017 20:09	08:04	09:11	03:22 05:55	07:19	27:35		
45%	■ OP_CIPSKID_RINSE:2	OP_CIPSKID_R		1/20/2017 13:51	08:03	09:11	03:21 05:52	07:21	27:34		
	OP CIPSKID RINSE:1	OP_CIPSKID_W		1/20/2017 13:22	08:09	09:11	03:23 06:02	07:17	27:35		
0%	OP_CIPSKID_LINERINSE:1	OP_CIPSKID_V	ASH:2	1/18/2017 0:03	07:59	09:11	03:21 05:37	07:50	27:32		
9%		Start of Parent E	vent 🔣	1/17/2017 13:19	08:11	09:11	03:23 05:48	07:30	27:34		
12%	OP_CIPSKID_FINALRINSE:1	12/21/2016 16:4	17	1/16/2017 17:33	08:07	09:08	03:21 05:44	07:29	27:32		
		12/29/2016 22:2		1/16/2017 16:48	08:04	09:07	03:20 05:47	07:20	27:34		
		12/30/2016 23:2	.7	1/16/2017 16:27	08:07	09:09	03:22 06:02	07:15	27:34		
		1/14/2017 4:36 1/16/2017 16:27	=	1/14/2017 4:36	08:03	09:09	03:20 05:40	07:39	33:53		
		1/16/2017 16:48		12/30/2016 23:27	08:05	09:08	03:21 05:36	07:56	27:35		
low Labels	Average of Duration	1/16/2017 17:33		12/29/2016 22:27	08:09	09:12	03:22 05:54	07:18	27:34		
P_CIPSKID_WASH:2	00:08:06	1/17/2017 13:19	· · ·	12/21/2016 16:47	08:06	09:12	03:22 05:48	07:15	27:33		
P_CIPSKID_WASH:1	00:09:10			12/21/2016 16:20	08:04	09:07	03:20 05:38	and the second second	27:34		
P_CIPSKID_RINSE:2	00:03:22			12/21/2016 13:28	08:05	09:13	03:22 05:50	and the second se	27:35		
P_CIPSKID_RINSE:1	00:05:48			12/21/2016 13:20	08:10	09:14	03:23 05:50		27:36		
P_CIPSKID_FINALRINSE:		-		12/20/2016 21:49	08:10	09:12	03:23 05:59		27:34		
irand Total	00:10:18	C)		12/19/2016 20:37	08:04	09:07	03:20 05:50	And the second second	27:34		
						00:10	00:20	00:30	00:40 00:50	01:00	0.
				00	.00	0.10	00.20	00.30	00:50	01:00	0
		D	ow Labels				J Start ti	me	End time	Duration	

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#### What did we demonstrate?

- Use PI Analytics for management insights
- Create management dashboard using Excel

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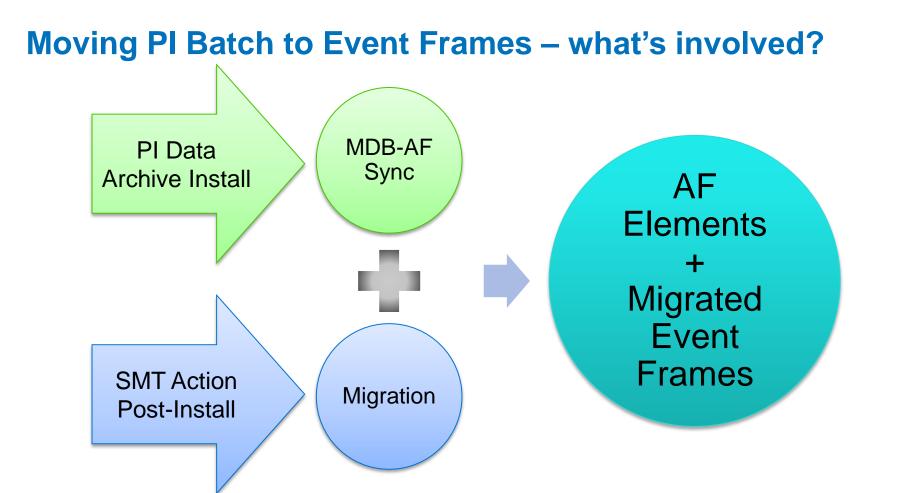
- material consumption
- economic costs
- Use PowerPivot Slicers to focus



## Batch to Event Frames Migration









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#### **Moving PI Batch to Event Frames – what's involved?**



<u>http://bit.ly/2moqsni</u>

#### Batch to Event Frames Migration Presentation

<u>http://bit.ly/2mw3k5N</u>













#### **RtReports and Event Frames**

#### When?

- Beta: May-June 2017
- Release: Target Q3 2017

#### What's Included?

- Printing No more Word!
- Regional PI Server Time Zones

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- Event Frames PI Batch sites
- Event Frames New sites

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#### **RtReports and Event Frames**

#### When?

- Beta: Q4 2017
- Release: Target Q1 2018

#### What's Included?

Direct AF Access via Journal Action

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Multiple AF Database Support



#### Should I wait for 4.1?

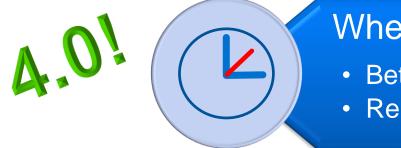
- 3.x and 4.0 reports will be forward-compatible!
- Reasons to move forward with 4.0:
  - Early EF adoption
  - Business Drivers requiring PI Integrator for Business Analytics

### In Summary - No reason to wait!





#### **RtReports and Event Frames**



#### When?

- Beta: May-June 2017
- Release: Target Q3 2017

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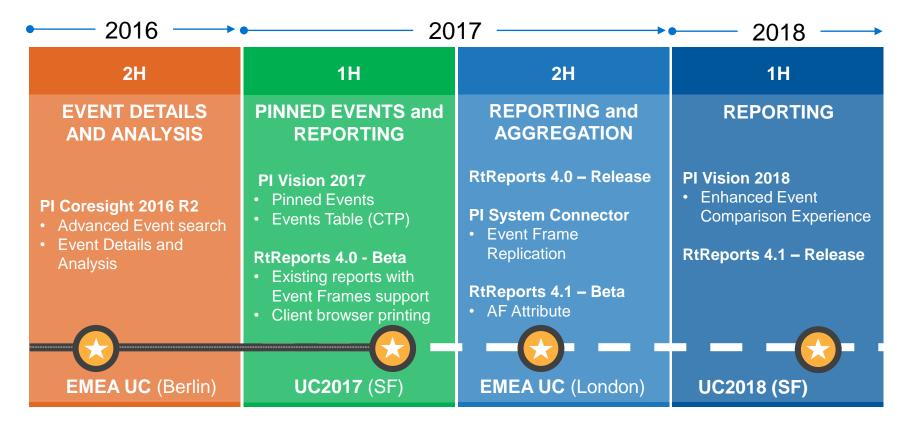
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#### Looking for Beta Testers! Please help us test this important release Confirm it works for your implementation We fix your bugs first!



#### **Event Frames Roadmap – moving forward to 2017-2018**



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