

Incorporate Event Frames into your Operations

Zahab Nabeel – Systems Engineer

Agenda



Introduction



Event Frame Context



Best Practices



Summary



Introduction to Event Frames

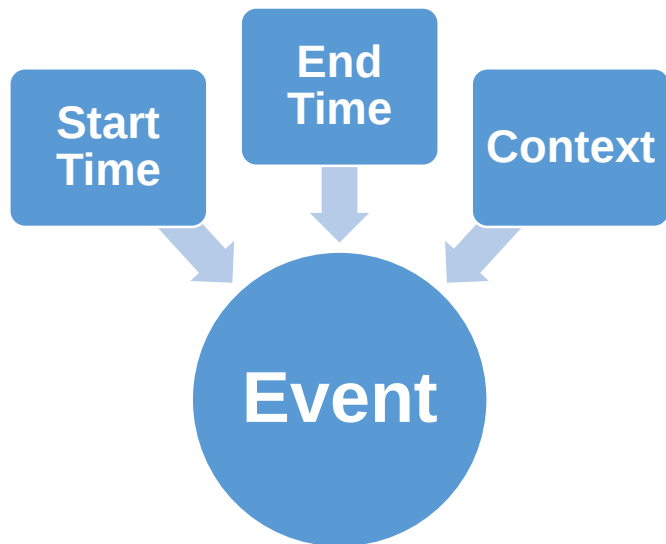


What are Event Frames?

- Bookmarks for time-series data
 - Capture critical event contexts
 - Provide meaning to users by making it easier to find, analyze, and report on an event



Event Frames



Referenced Elements	Name
	OW-206
	OW-207

Name	Value
Category: General Info	
Operator	Bobby Wolf
Operator Comment	
Phase	Dwell
Type	LOW TEMP
Category: Limits	
Temp.Limit.High1	88 °C
Temp.Limit.Low	70 °C
Category: Manual Logger	
Comment	0
Category: Process Parameters	
Level.Start	42.743 L
Temp.End	71.154 °C
Temp.Max	71.154 °C
Temp.Min	62.166 °C
Temp.Range	8.988 °C
Temp.Start	62.166 °C

Asset(s)
associated to the
event

Text entries useful
for filtering/group-
by analysis

Placeholders for
manual data entry

Calculated data
using event start &
end time context

Event Frame Introduction

	   	Name	§ [00:47:30]	Duration	Start Time	End Time	Template	
	 	 Pulp_BID-111605		0:47:30	9/13/2017 11:49:53 AM	9/13/2017 12:37:23 PM	Procedure	

Event Frame Introduction

		Name	§ [00:47:30]	Duration	Start Time	End Time	Template	
[-]	[+]	Pulp_BID-111605	[Timeline]	0:47:30	9/13/2017 11:49:53 AM	9/13/2017 12:37:23 PM	Procedure	
	[+]	Procedure 104	[Timeline]	0:14:00	9/13/2017 11:49:53 AM	9/13/2017 12:03:53 PM	UnitProcedure	
[+]	[+]	Procedure A204	[Timeline]	0:39:30	9/13/2017 11:57:53 AM	9/13/2017 12:37:23 PM	UnitProcedure	

Parent Event Frame

Children Event Frames

Event Frame Introduction

		Name	S [00:47:30]	Duration	Start Time	End Time	Template
[-]	[+]	Pulp_BID-111605	[Timeline]	0:47:30	9/13/2017 11:49:53 AM	9/13/2017 12:37:23 PM	Procedure
	[+]	Procedure 104	[Timeline]	0:14:00	9/13/2017 11:49:53 AM	9/13/2017 12:03:53 PM	UnitProcedure
	[+]	Procedure A204	[Timeline]	0:39:30	9/13/2017 11:57:53 AM	9/13/2017 12:37:23 PM	UnitProcedure
[+]	[+]	Idle	[Timeline]	0:03:00	9/13/2017 11:58:23 AM	9/13/2017 12:01:23 PM	Operation
[+]	[+]	Prehydrolysis	[Timeline]	0:22:00	9/13/2017 12:01:23 PM	9/13/2017 12:23:23 PM	Operation

Parent Event Frame

Children Event Frames

Grandchildren Event Frames

Event Frame Introduction

Name		Value
Category: General Info		
	Operator	Bobby Wolf
	Operator Comment	
	Phase	Dwell
	Type	LOW TEMP
Category: Limits		
	Temp.Limit.High1	88 °C
	Temp.Limit.Low	70 °C
Category: Manual Logger		
	Comment	0
Category: Process Parameters		
	Level.Start	42.743 L
	Temp.End	71.154 °C
	Temp.Max	71.154 °C
	Temp.Min	62.166 °C
	Temp.Range	8.988 °C
	Temp.Start	62.166 °C

Creating Event Frames

Batch
Framework
Interfaces

Asset
Analytics

AFSDK

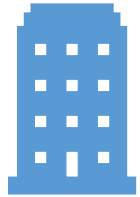
Asset Analytics

Perform calculations on a specified schedule

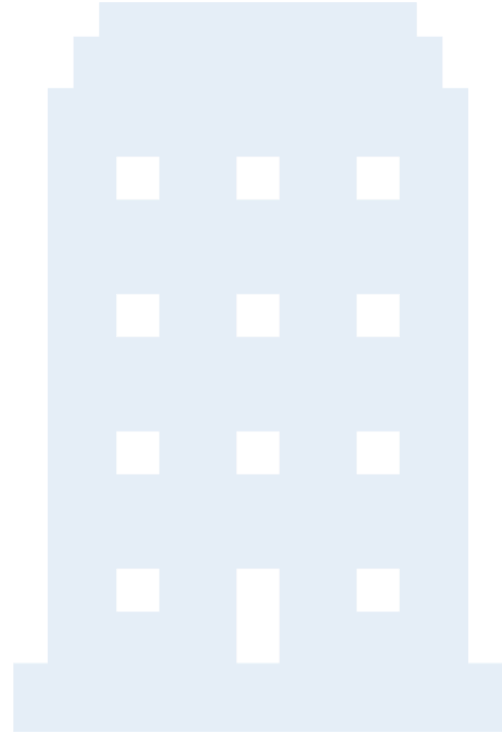
Use AF Attribute values as inputs

Outputs:

- Calculation Results
- Rollup
- Event Frames
- SQC



Building Event Frame Context



Event Frame Context – “Why?”

Why do critical events matter?

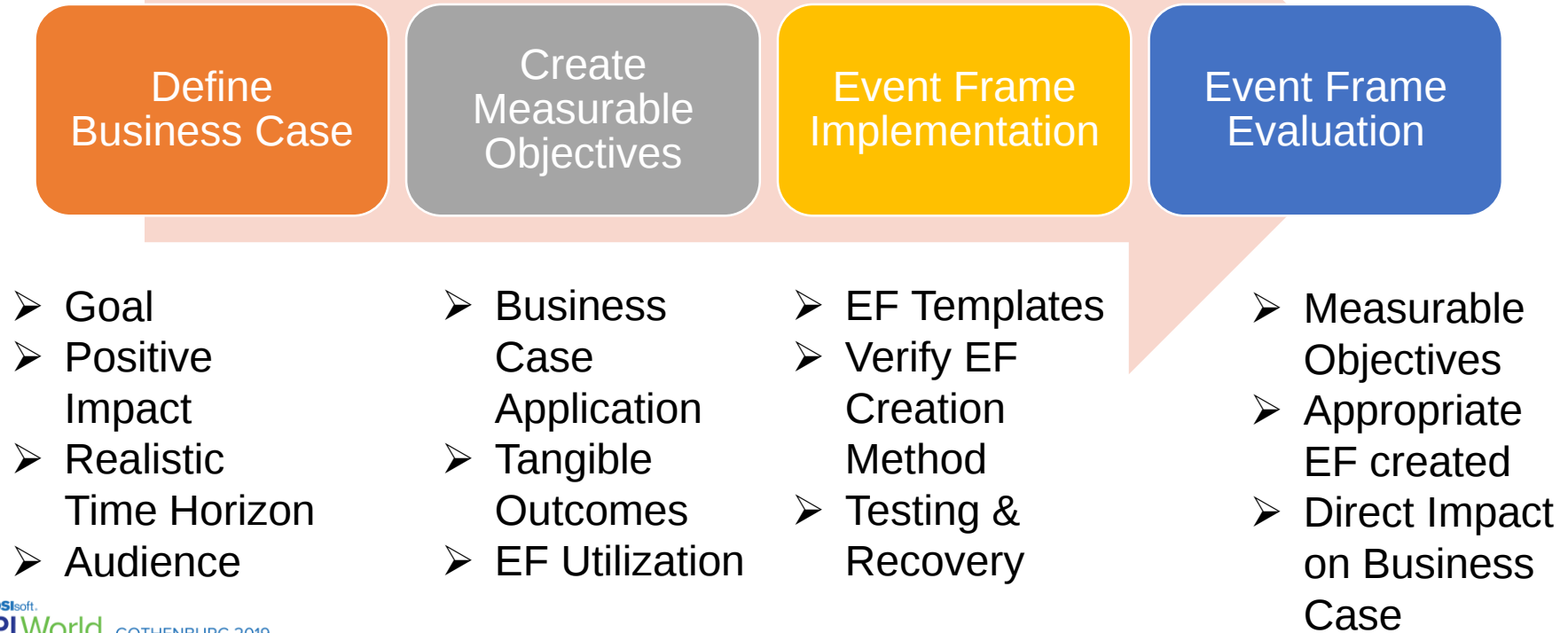
Why should users invest in Event Frames?

Event Frame Context – “Why?”

Critical events define success (or lack thereof)

Event Frames have a direct impact on solving a business problem

Building Event Frame Context



Building Event Frame Context Example

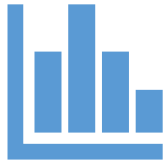


- Pump Downtime Alarms
- Internal & Customer
- Immediately
- Equipment Operators

- EF Spanning Downtime
- Reason Code
- Duration
- EF Utilization

- EF Templates
- Read Pump Status Code
- Map Attributes
- Recovery

- Business Case met?
- Measurable Objectives
- Appropriateness



Capturing Meaningful Data



Capture Meaningful Data

**What percentage of
your Event Frames
are utilized after
creation?**



Capture Meaningful Data

Capture *meaningful* data – not *all* data



PI Data
Archive

All Data



PI Asset
Framework

Context, Metadata

PI Event Frames



Data Bookmarks

Capture Meaningful Data

Ideal Scenario

- Capture critical event contexts

Observed Scenario

- Tendency to capture *anything and everything*

Problem Statement

- What counts as critical event contexts?
 - What events need to be captured?



Solution



Create business cases!



Create evaluation process:

Templates

Asset Analytics

Result



Addition and deletion:

Templates
Analyses



Bulk Event Frame recovery/deletion



Refined business cases

Customer Hesitancy

“We may need these in the future”

“These Event Frames are essential to our operation”

“We don’t know who may be depending on these Event Frames”



Recommendations

- What business case is directly impacted?
- Repeat evaluation process and update accordingly

Capture Meaningful Takeaway



**Capture *meaningful*
data – not *all* data**



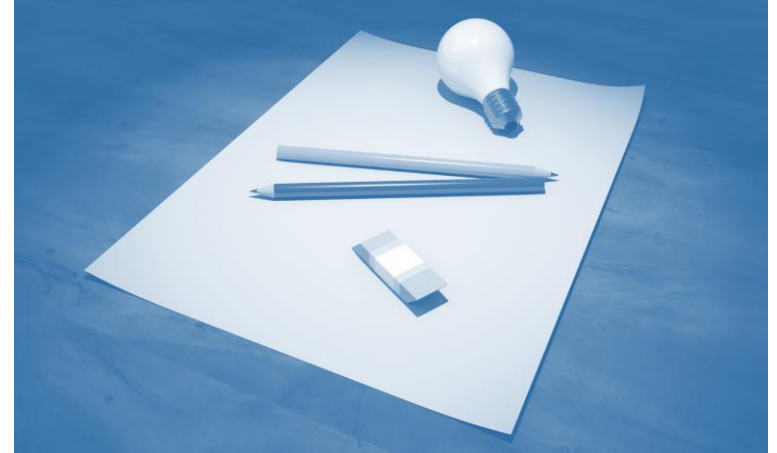
**Leverage business
case accordingly**



**Utilize the strengths
of the PI System**

**Event Frame
Recalculation/R
ecovery**

Best Practices: Creation



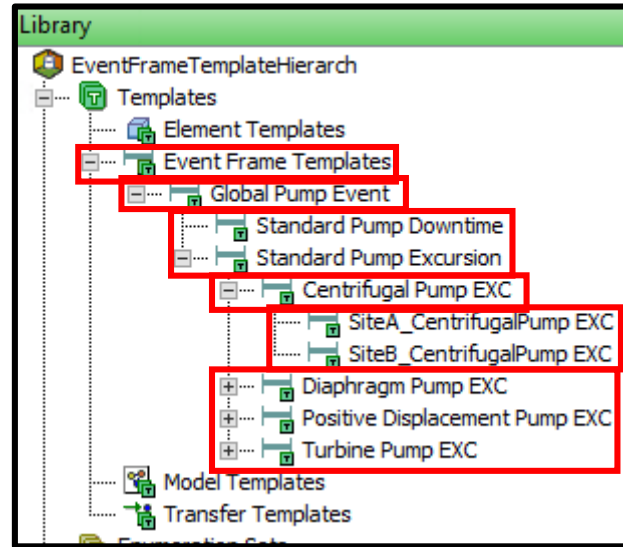
Best Practices: Creation

Derived Templates

Event Frames with Varying Severity

Event Frame Calculations

Derived Templates



Derived Templates



Create Event Frame Template Hierarchy



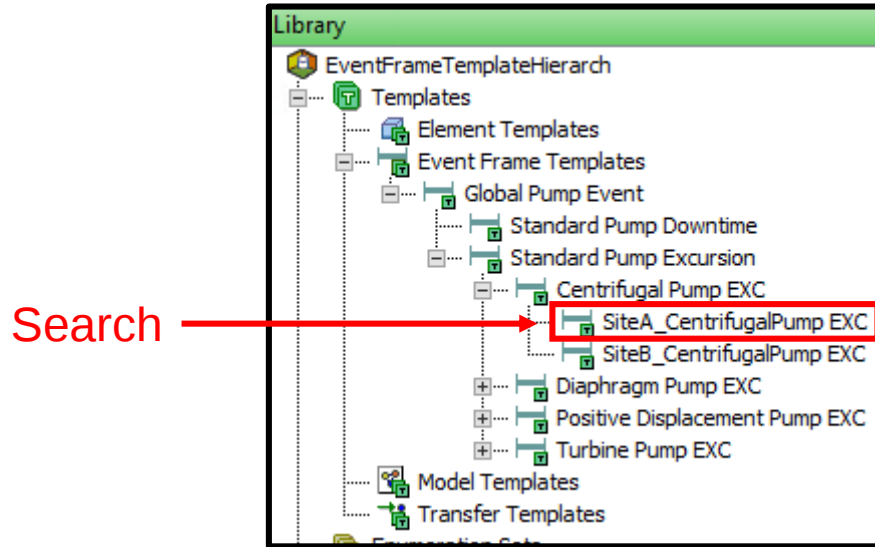
Enables:

Efficient searching

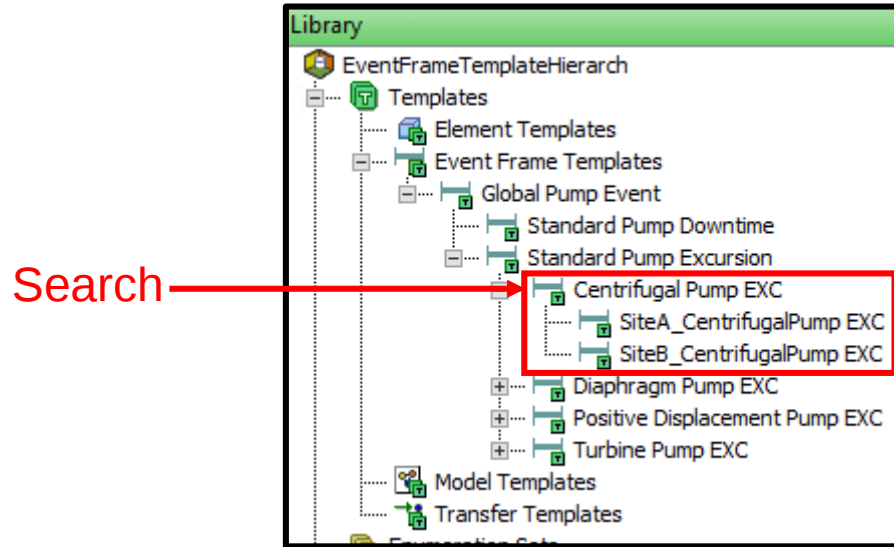
Comprehensive results

Standardized Event Frames and Attributes

Derived Templates

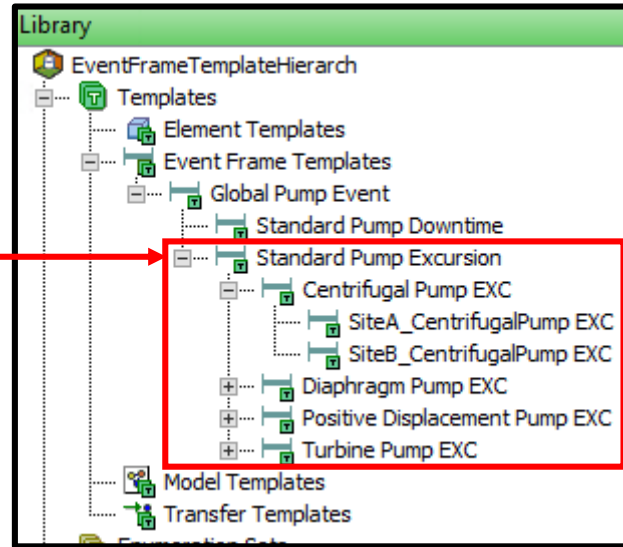


Derived Templates



Derived Templates

Search



Event Frames with Varying Severity

Event Frame Search 1						
Filter						
	Name	[00:02:47]	Duration	Start Time	End Time	Severity
	 SiteA - Centrifugal Pump Excursion_2019-04-01 13:49.15.000		0:02:47	4/1/2019 1:49:15 PM	4/1/2019 1:52:02 PM	Critical

Event Frames with Varying Severity

Event Frame Search 1							
Filter							
	Name	[00:02:47]	Duration	Start Time	End Time	Severity	
☒	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:02:47	4/1/2019 1:49:15 PM	4/1/2019 1:52:02 PM	Critical	
	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:00:54	4/1/2019 1:49:15 PM	4/1/2019 1:50:09 PM	Minor	
	SiteA - Centrifugal Pump Excursion_2019-04-01 13:50:09.000		0:00:50	4/1/2019 1:50:09 PM	4/1/2019 1:50:59 PM	Major	
	SiteA - Centrifugal Pump Excursion_2019-04-01 13:50:59.000		0:01:03	4/1/2019 1:50:59 PM	4/1/2019 1:52:02 PM	Critical	

Event Frames with Varying Severity



Create multiple child Event Frames

Single start trigger needs to be true
Only create direct children



Ideal use cases:

Increasing/decreasing severity
alarms
Simple process monitoring
“Grouped alarm” scenario

Event Frames with Varying Severity

Create multiple
start triggers

- Minor Severity – Pump Speed greater than HI limit
- Major Severity – Pump Speed greater than HHH limit
- Critical Severity – Pump Speed greater than maximum limit

Event Frames with Varying Severity

Event Frame Search 1					
Filter					
Name	[00:00:01]	Duration	Start Time	End Time	Severity
SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:00:07.278	4/1/2019 1:49:15 PM		Minor

Event Frames with Varying Severity

Event Frame Search 1						
Filter						
	Name	[00:00:54]	Duration	Start Time	End Time	Severity
	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:01:06.272	4/1/2019 1:49:15 PM		Major
	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:00:54	4/1/2019 1:49:15 PM	4/1/2019 1:50:09 PM	Minor
	SiteA - Centrifugal Pump Excursion_2019-04-01 13:50:09.000		0:00:12.274	4/1/2019 1:50:09 PM		Major

Event Frames with Varying Severity

Event Frame Search 1						
Filter						
	Name	[00:01:44]	Duration	Start Time	End Time	Severity
☒	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:01:53.157	4/1/2019 1:49:15 PM		Critical
☐	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:00:54	4/1/2019 1:49:15 PM	4/1/2019 1:50:09 PM	Minor
☐	SiteA - Centrifugal Pump Excursion_2019-04-01 13:50:09.000		0:00:50	4/1/2019 1:50:09 PM	4/1/2019 1:50:59 PM	Major
☐	SiteA - Centrifugal Pump Excursion_2019-04-01 13:50:59.000		0:00:09.165	4/1/2019 1:50:59 PM		Critical

Event Frames with Varying Severity

Event Frame Search 1						
Filter						
	Name	[00:02:47]	Duration	Start Time	End Time	Severity
☐	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:02:47	4/1/2019 1:49:15 PM	4/1/2019 1:52:02 PM	Critical
☐	SiteA - Centrifugal Pump Excursion_2019-04-01 13:49:15.000		0:00:54	4/1/2019 1:49:15 PM	4/1/2019 1:50:09 PM	Minor
☐	SiteA - Centrifugal Pump Excursion_2019-04-01 13:50:09.000		0:00:50	4/1/2019 1:50:09 PM	4/1/2019 1:50:59 PM	Major
☐	SiteA - Centrifugal Pump Excursion_2019-04-01 13:50:59.000		0:01:03	4/1/2019 1:50:59 PM	4/1/2019 1:52:02 PM	Critical

Event Frame Calculations

Asset Analytics

Variables and Output Expressions

Utilize Event Frame Context

- Start Time
- End Time
- Duration

Event Frame Calculations

Store calculation results

- Captured on EF close
- Event Frame attribute
- PI Tag

Outputs at close	
Output1	<code>TagAvg('Pump Speed',EventFrame("StartTime"), EventFrame("EndTime"))</code>

Event Frame Calculations

Ideal Use Cases:

- Calculations that require Event Frame context
- Capture information unique to particular events
- Conditional calculations
- Shift calculations

Best Practices: Visualization



Best Practices: Visualization



Reason Codes



Pinned Events



Event Frame Comparison



Event Frame Details

Reason Codes

How can we write back
to Event Frames?

How can operators
update Event Frames
with pertinent
information after the
fact?

Reason Codes

Write back to Event Frames

Select options from multi-tiered enumeration set

ImportantEF_2018-09-05 13:10:56.000

General Child Event Frames Referenced Elements Attributes

Filter

Name	Value
Attribute 1	88.803
EF StartTime	0
NamingAttribute	EFName3
Reason	<None>

Deviation

Maintenance

Out Of Range

Sort By

High

Low

HighHigh

LowLow

Reason Codes

Event Name	▲ Start Time	End Time	Reason
ImportantEF_2018-09-05 13:10:56.000	9/5/2018 1:10:56 PM	9/5/2018 1:11:12 PM	

Reason Codes

Reason Code Editor

ImportantEF_2018-09-05 13:10:56.000

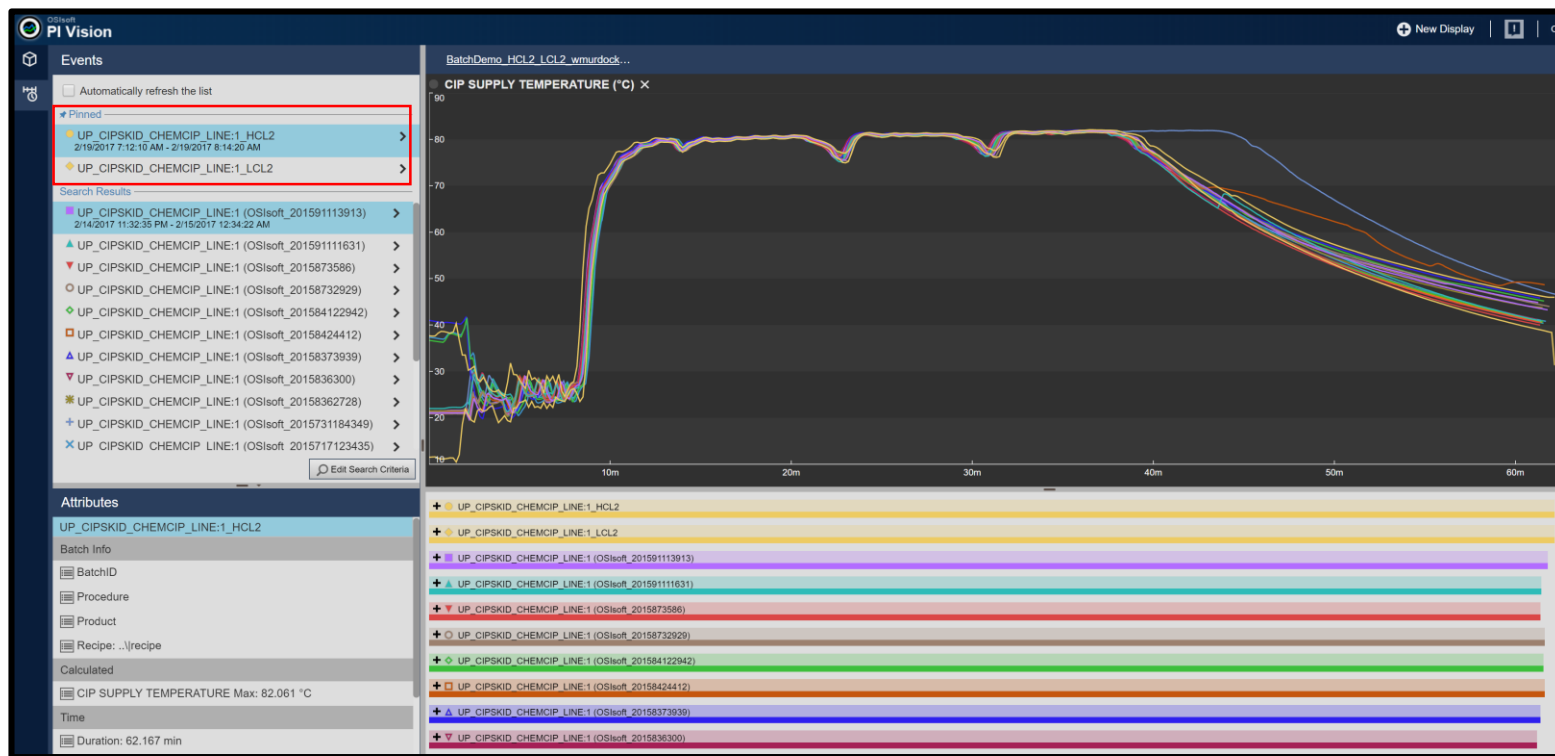
- Reason
 - Deviation
 - High
 - HighHigh
 - Low
 - LowLow
 - Maintenance
 - Planned
 - Unplanned
 - Out Of Range

Clear Apply Cancel

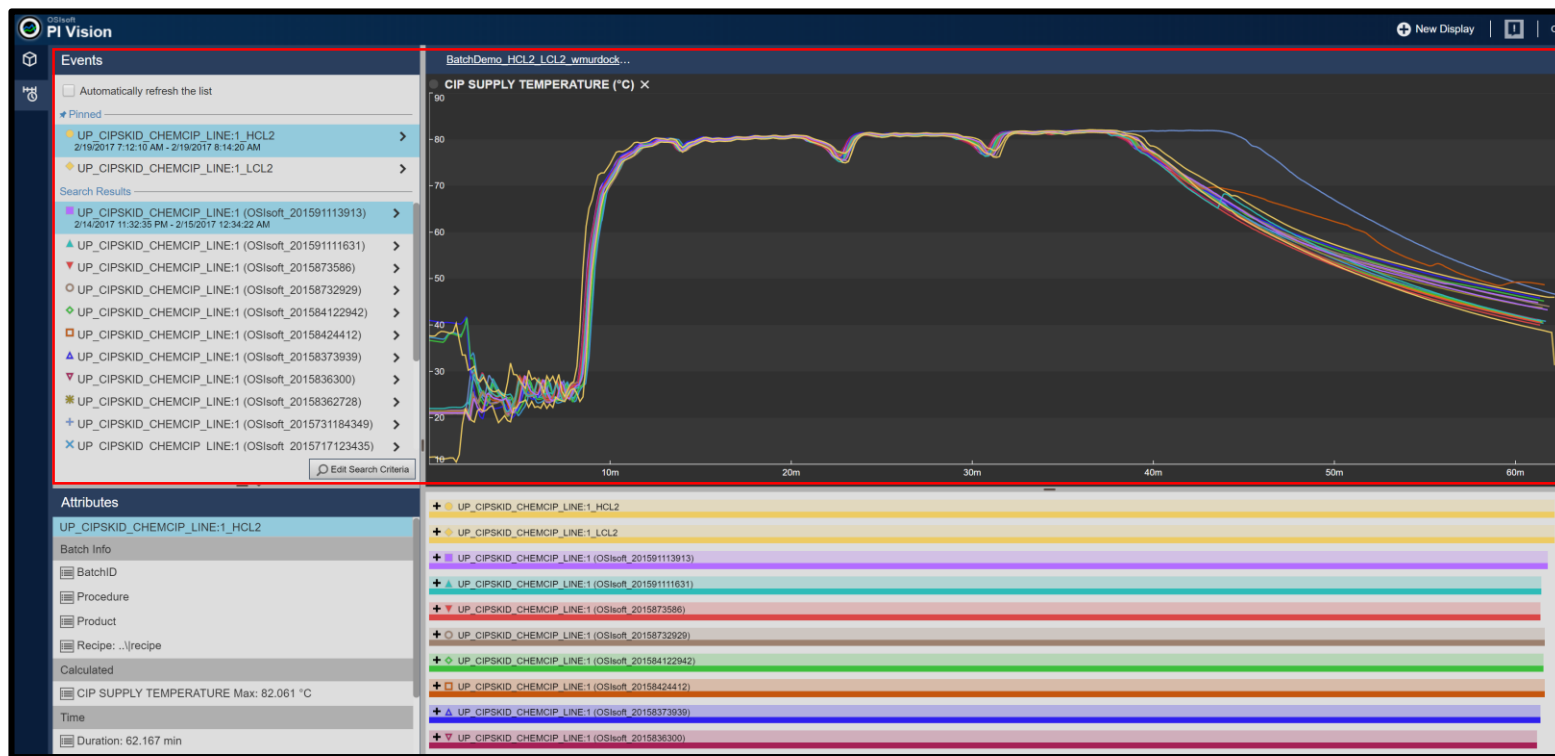
Reason Codes

Event Name	Start Time	End Time	Reason
ImportantEF_2018-09-05 13:10:56.000	9/5/2018 1:10:56 PM	9/5/2018 1:11:12 PM	Deviation HighHigh

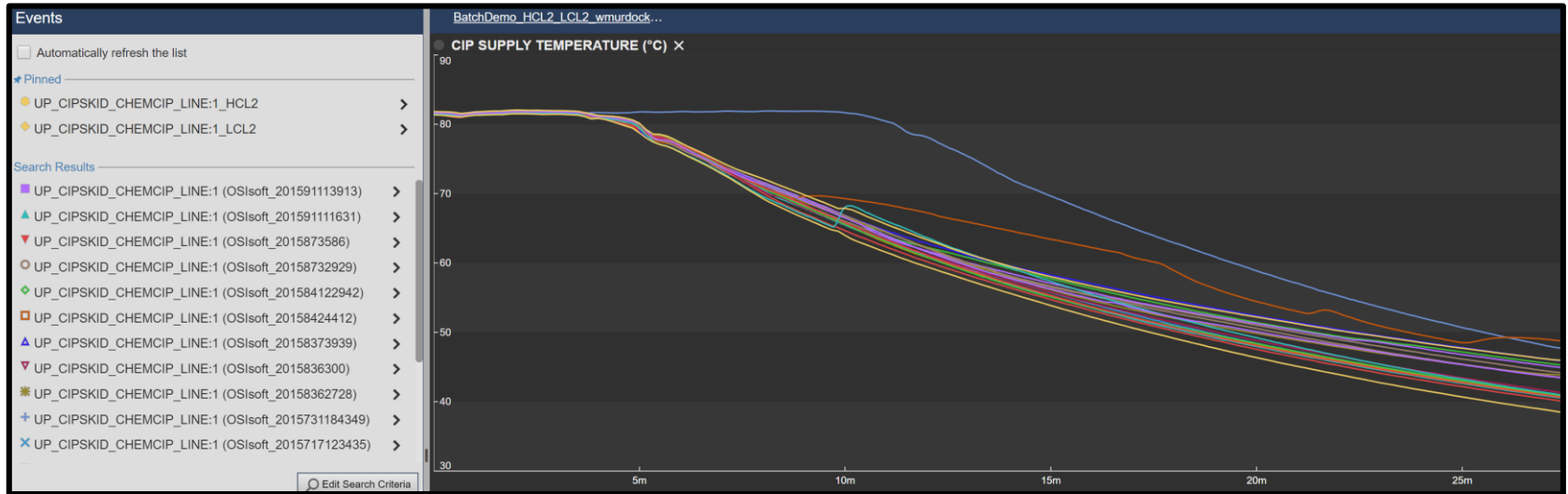
Pinned Events



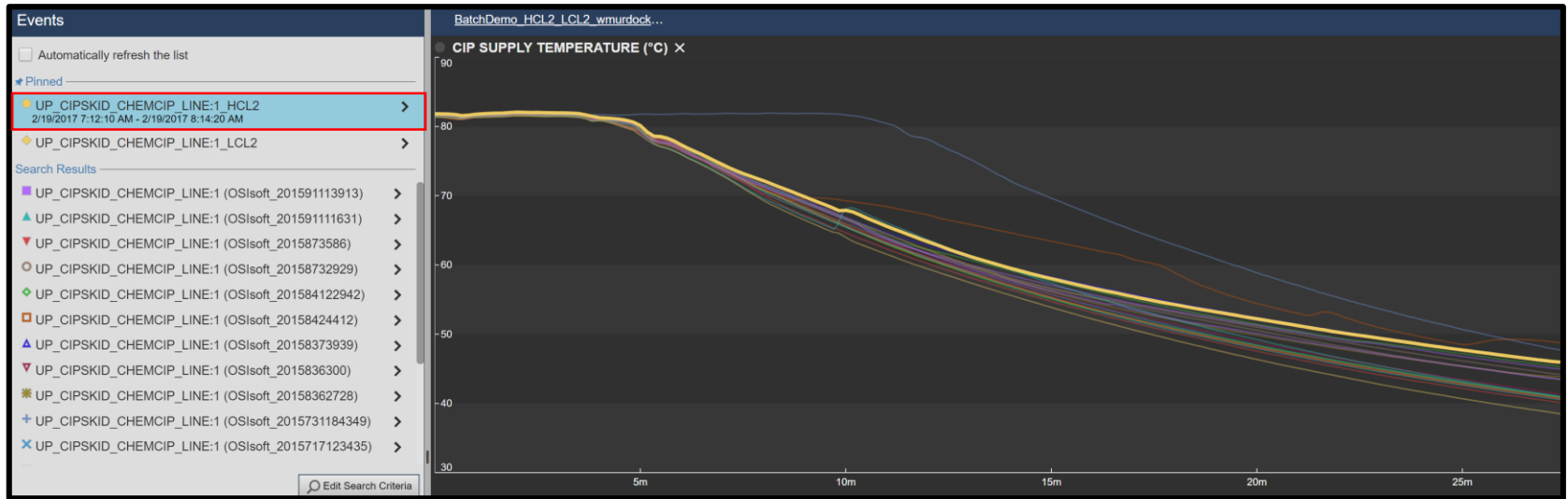
Pinned Events



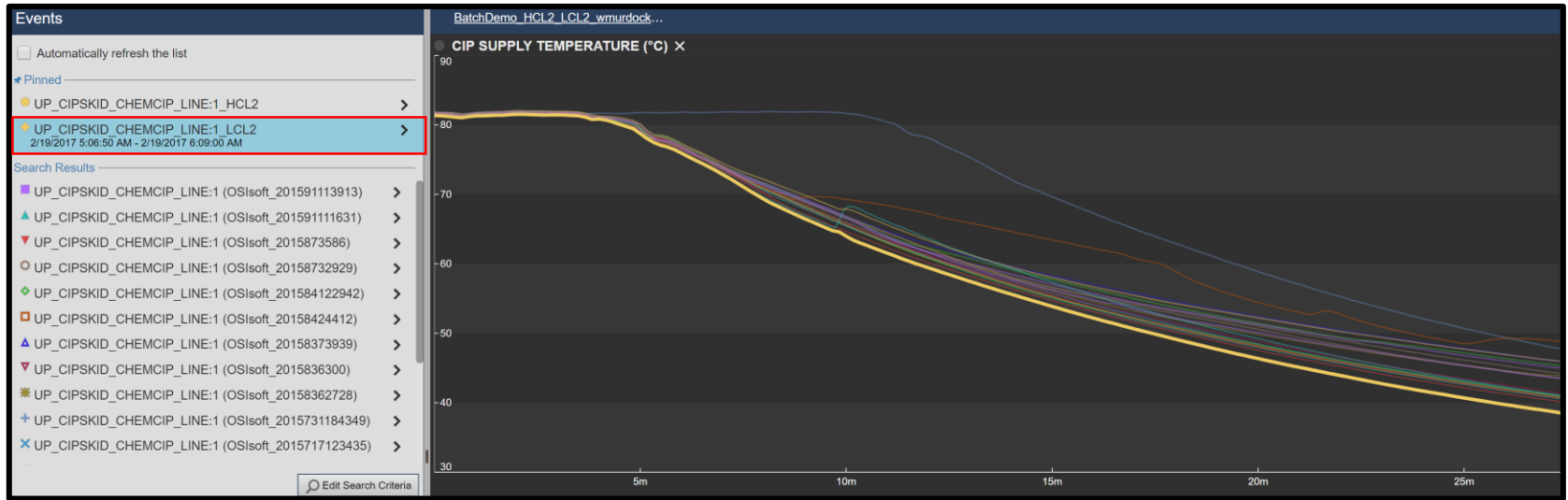
Pinned Events



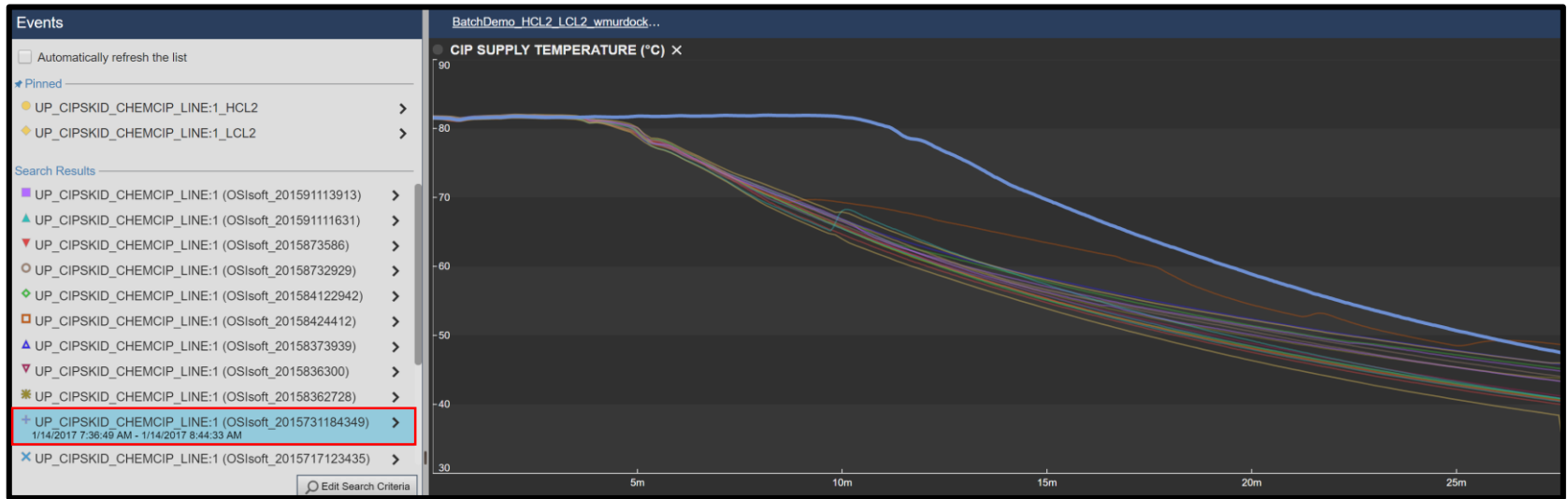
Pinned Events



Pinned Events



Pinned Events



Event Frame Comparison

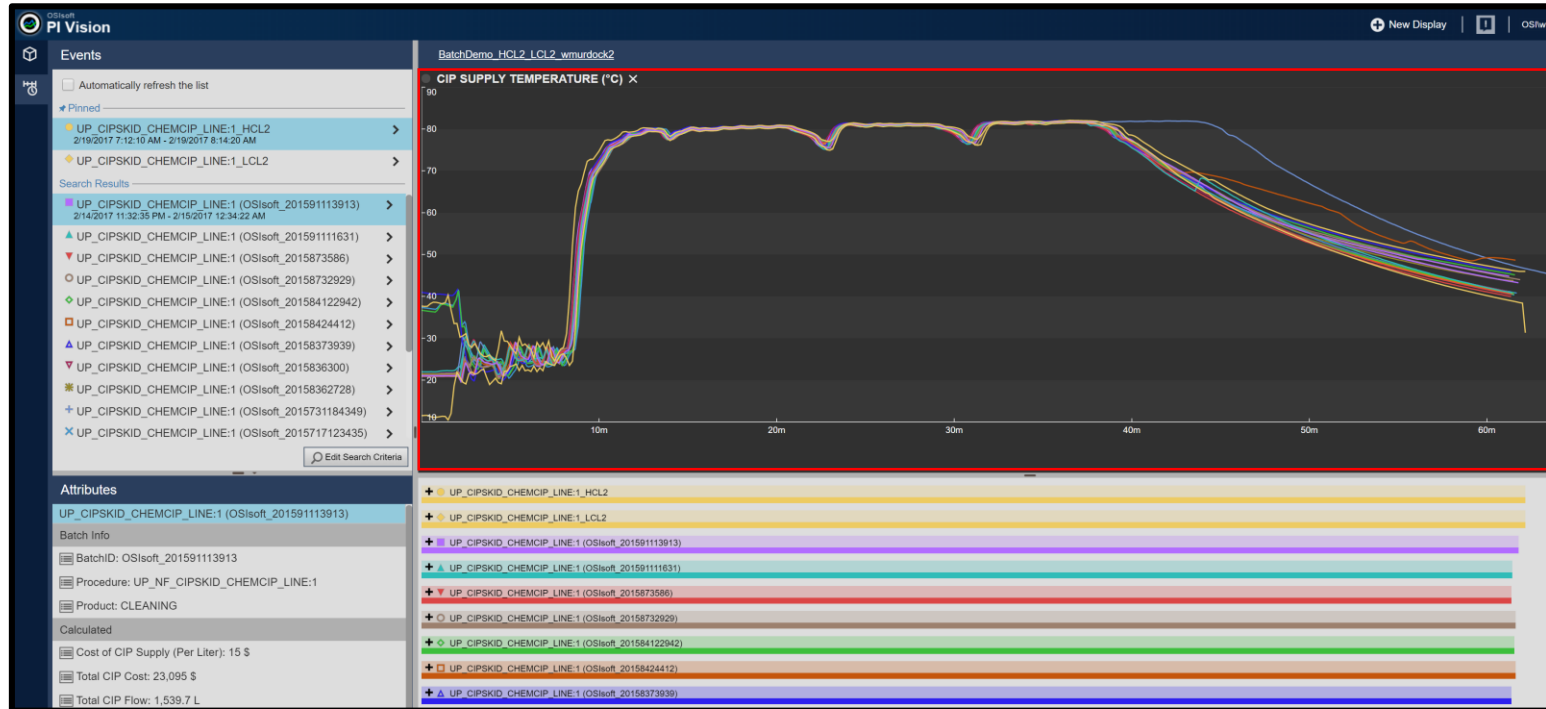
View and analyze data within Event time range

Context visualization

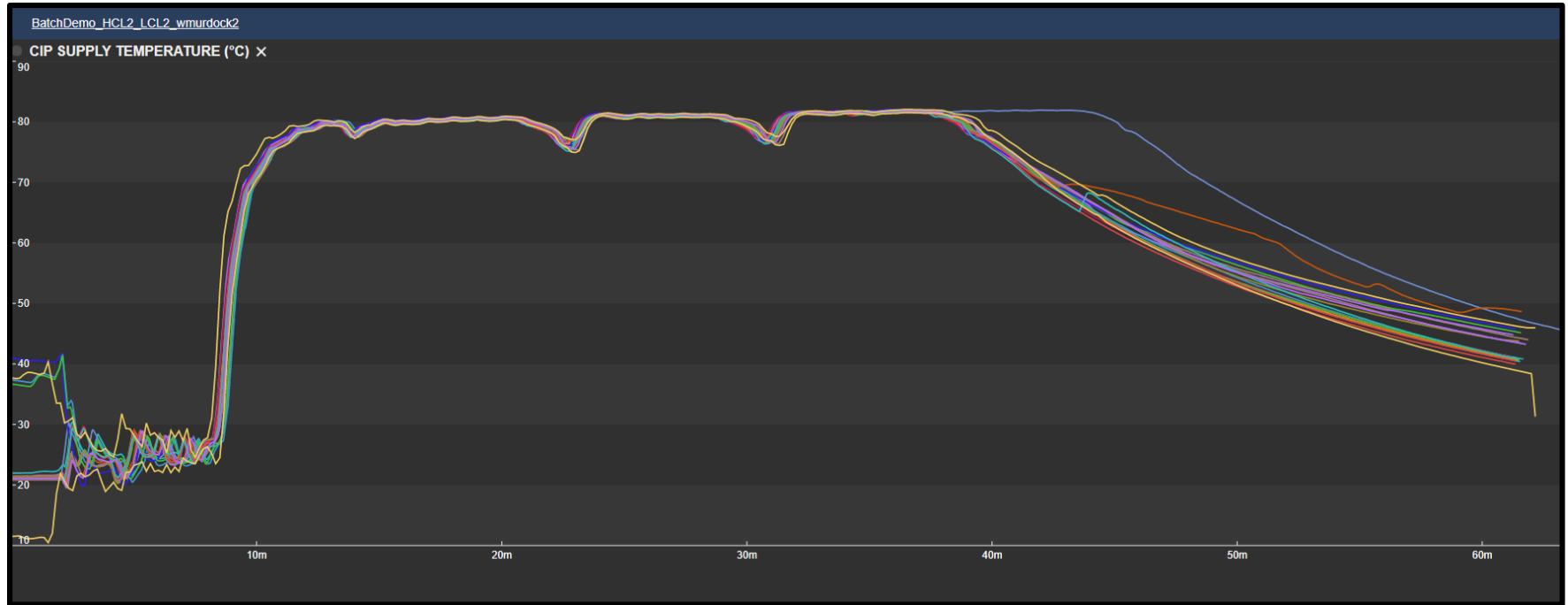
Utilizes the power of templates

- Compare like events
- Analyze root cause

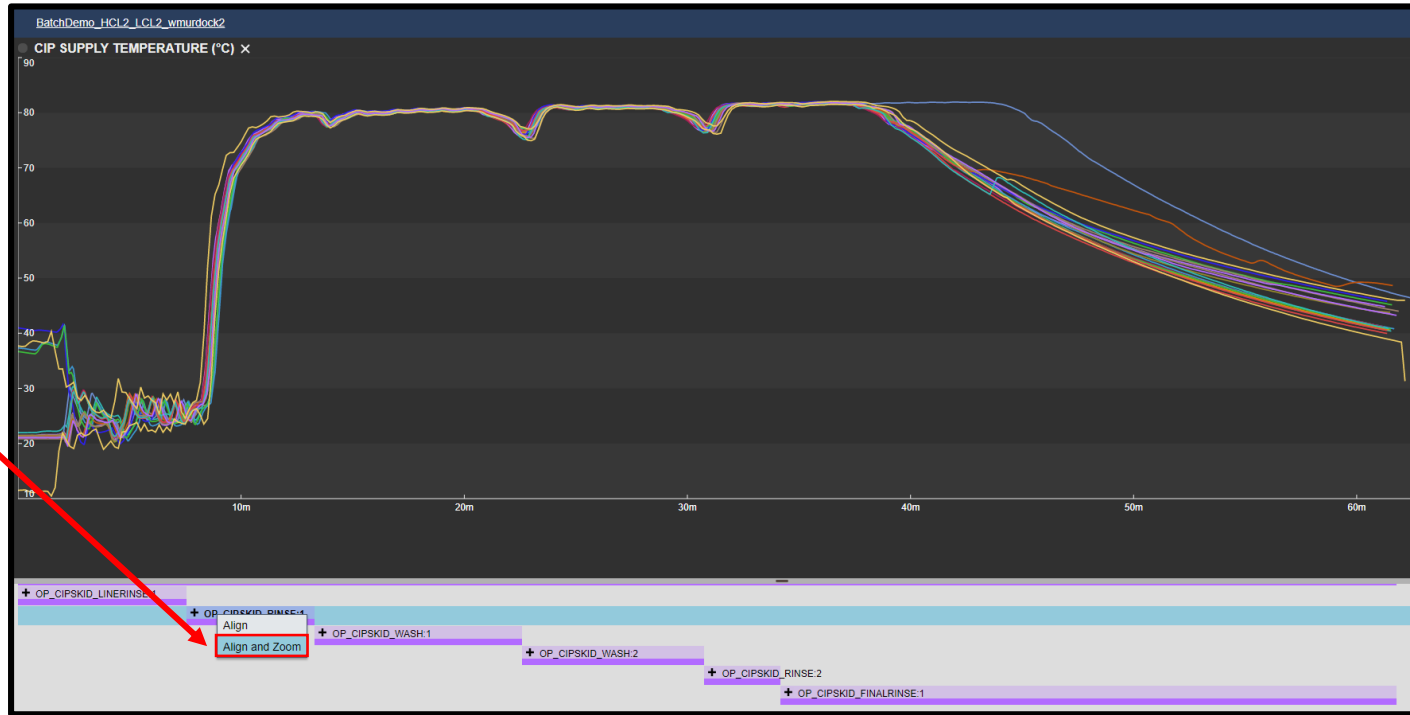
Event Frame Comparison



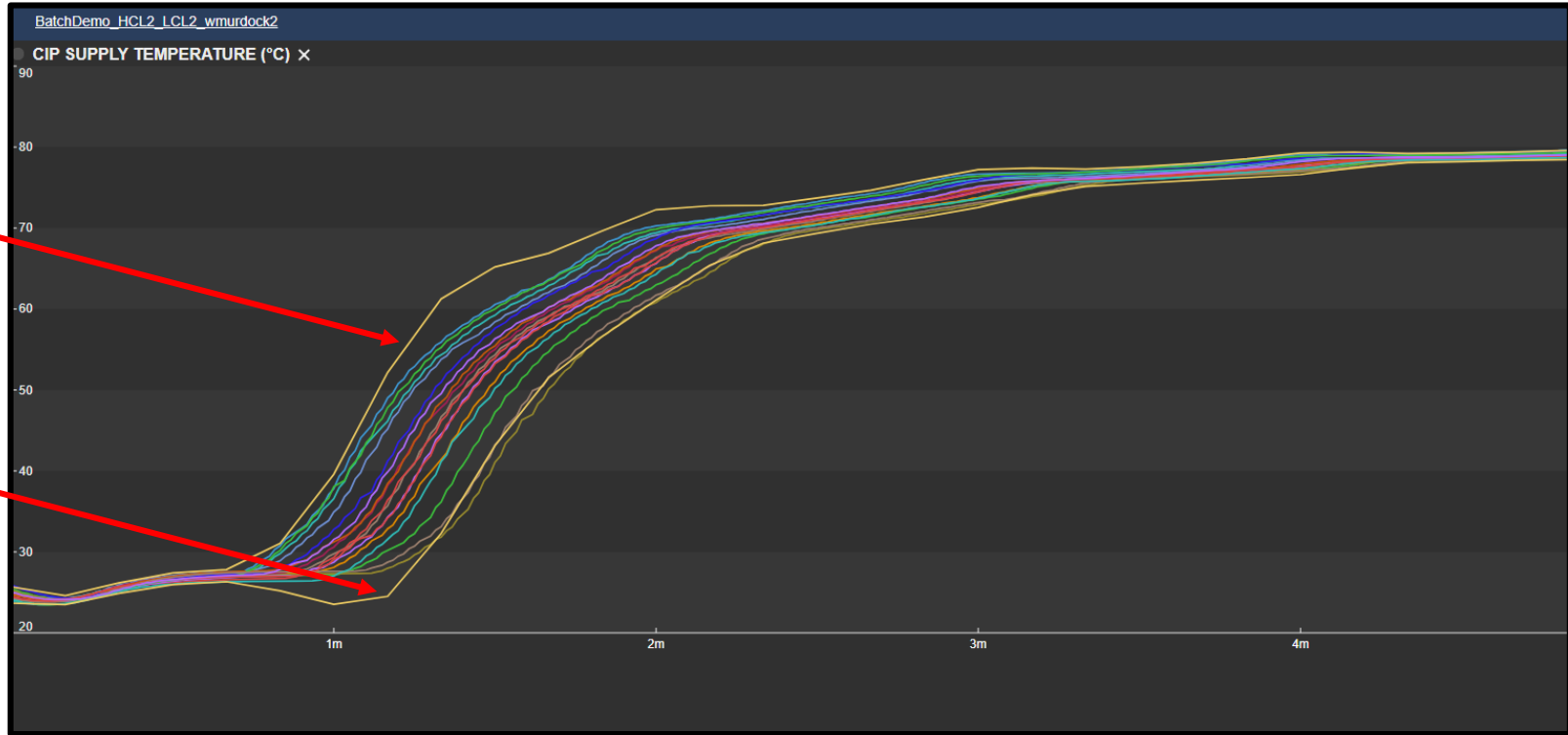
Event Frame Comparison



Event Frame Comparison



Event Frame Comparison

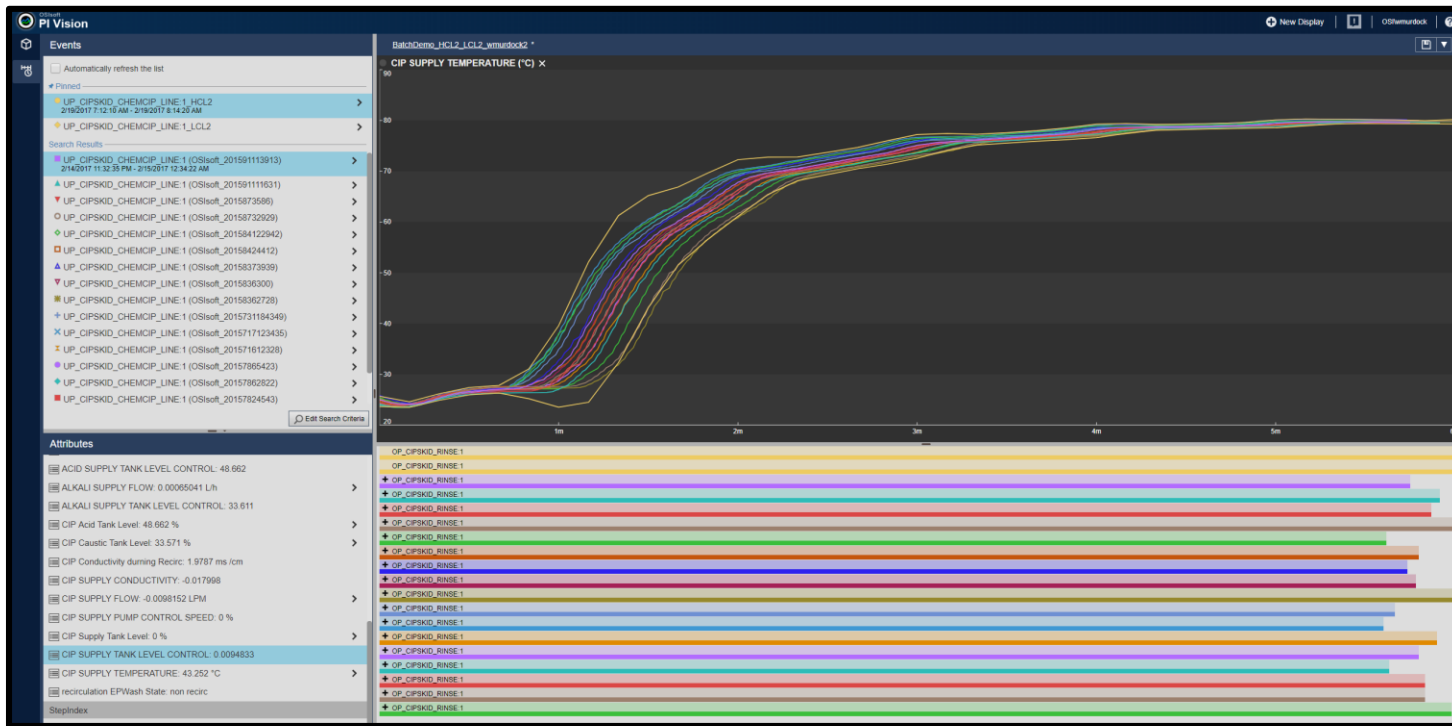


Event Comparison

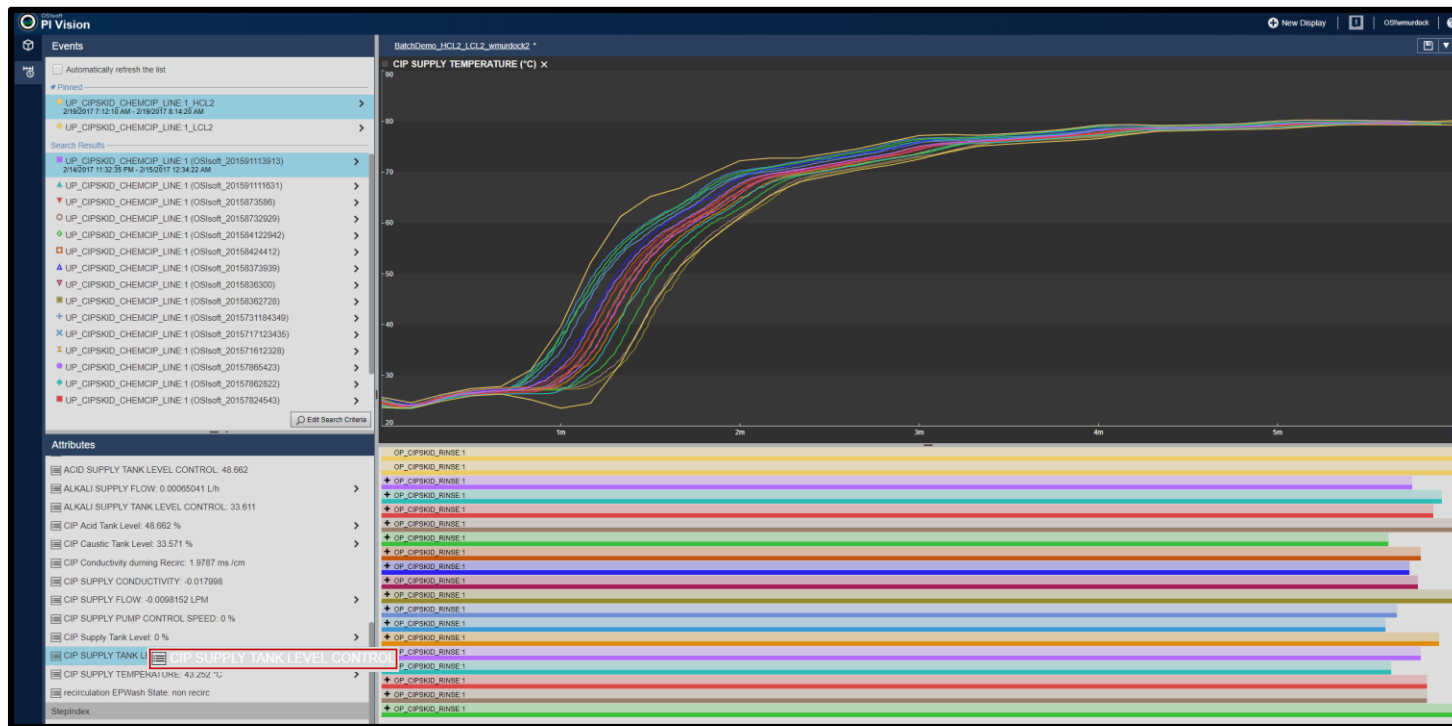
Events	
☐ Automatically refresh the list	
★ Pinned	
● UP_CIPSKID_CHEMCIP_LINE:1_HCL2 2/19/2017 7:12:10 AM - 2/19/2017 8:14:20 AM	>
◆ UP_CIPSKID_CHEMCIP_LINE:1_LCL2	>
Search Results	
■ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_201591113913) 2/14/2017 11:32:35 PM - 2/15/2017 12:34:22 AM	>
▲ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_201591111631)	>
▼ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_2015873586)	>
○ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_20158732929)	>
◆ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_201584122942)	>
■ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_20158424412)	>
▲ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_20158373939)	>
▼ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_2015836300)	>
✱ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_20158362728)	>
✚ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_2015731184349)	>
✕ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_2015717123435)	>
✱ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_201571612328)	>
● UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_20157865423)	>
◆ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_20157862822)	>
■ UP_CIPSKID_CHEMCIP_LINE:1 (OSIsoft_20157824543)	>
Edit Search Criteria	

Attributes	
■ ACID SUPPLY TANK LEVEL CONTROL: 48.662	
■ ALKALI SUPPLY FLOW: 0.00065041 L/h	>
■ ALKALI SUPPLY TANK LEVEL CONTROL: 33.611	
■ CIP Acid Tank Level: 48.662 %	>
■ CIP Caustic Tank Level: 33.571 %	>
■ CIP Conductivity during Recirc: 1.9787 ms /cm	
■ CIP SUPPLY CONDUCTIVITY: -0.017998	
■ CIP SUPPLY FLOW: -0.0098152 LPM	>
■ CIP SUPPLY PUMP CONTROL SPEED: 0 %	
■ CIP Supply Tank Level: 0 %	>
■ CIP SUPPLY TANK LEVEL CONTROL: 0.0094833	
■ CIP SUPPLY TEMPERATURE: 43.252 °C	>
■ recirculation EPWash State: non recirc	
StepIndex	
■ Step Indexes: 0	>

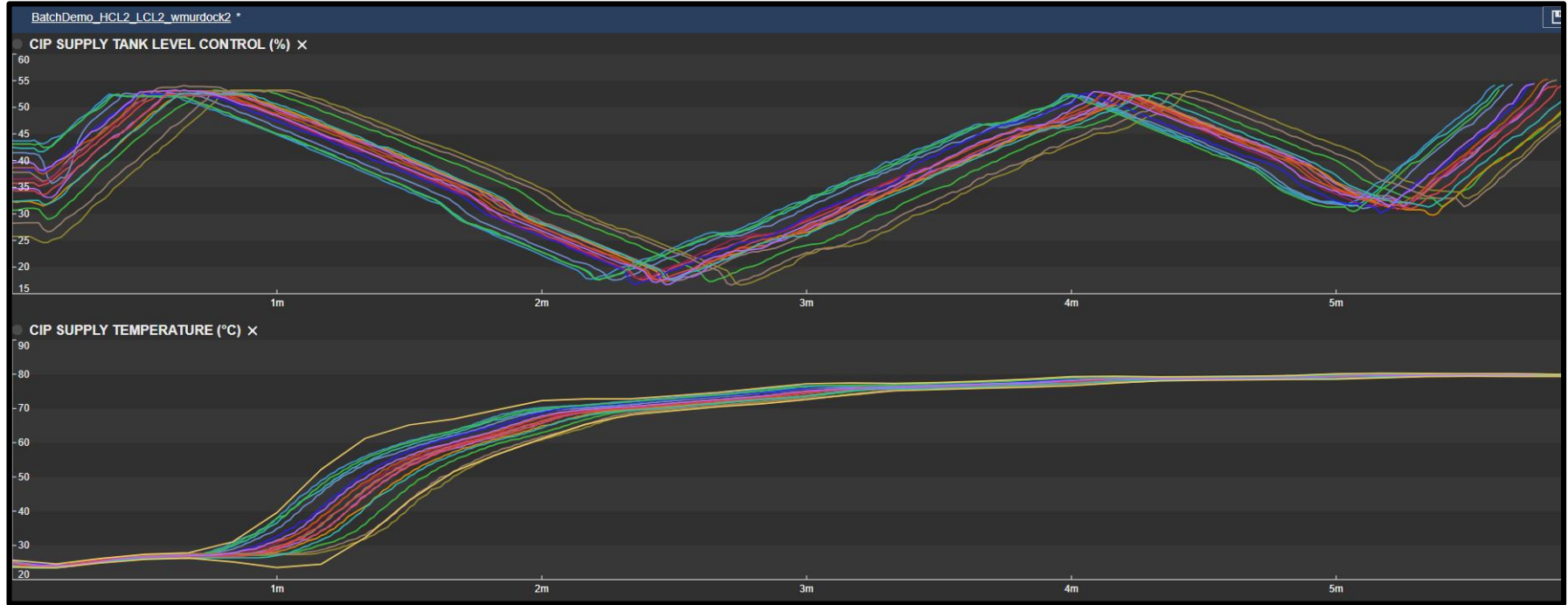
Event Frame Comparison



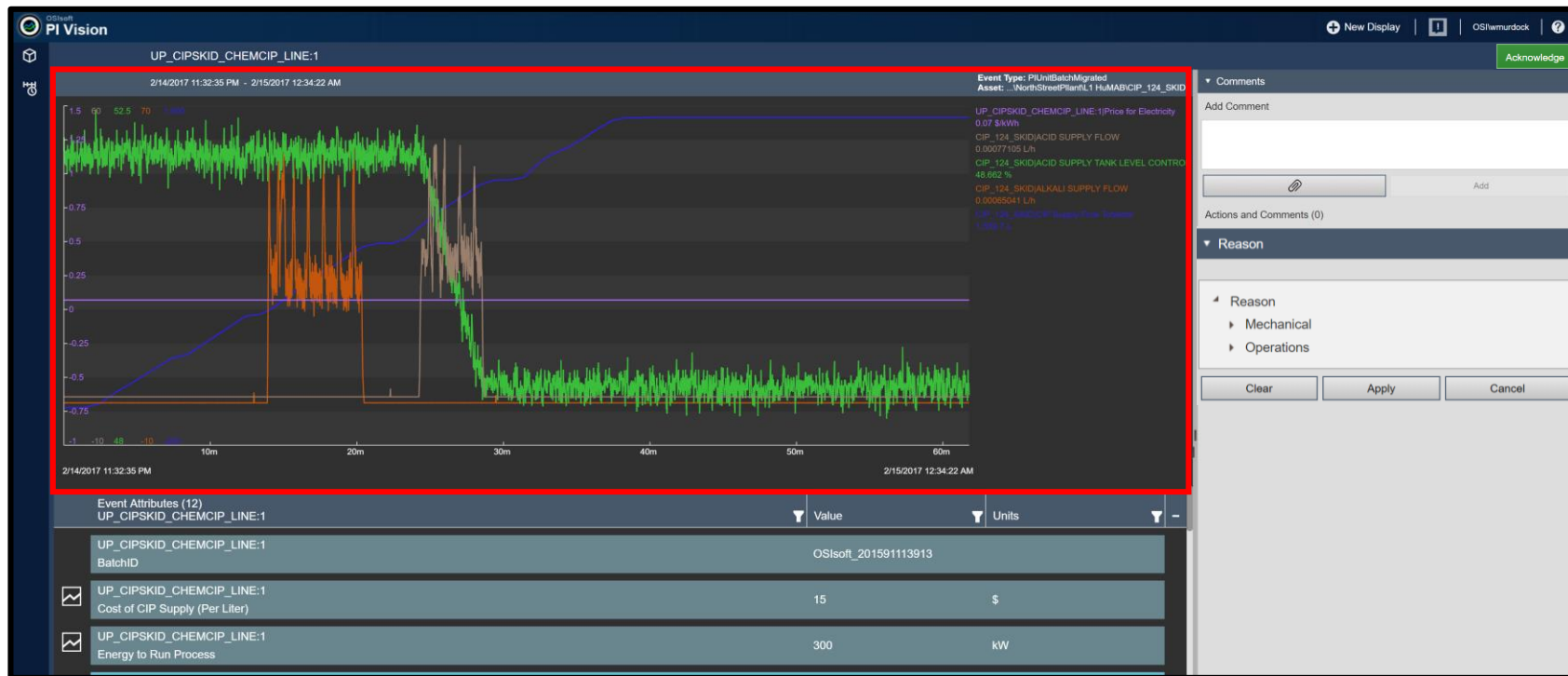
Event Frame Comparison



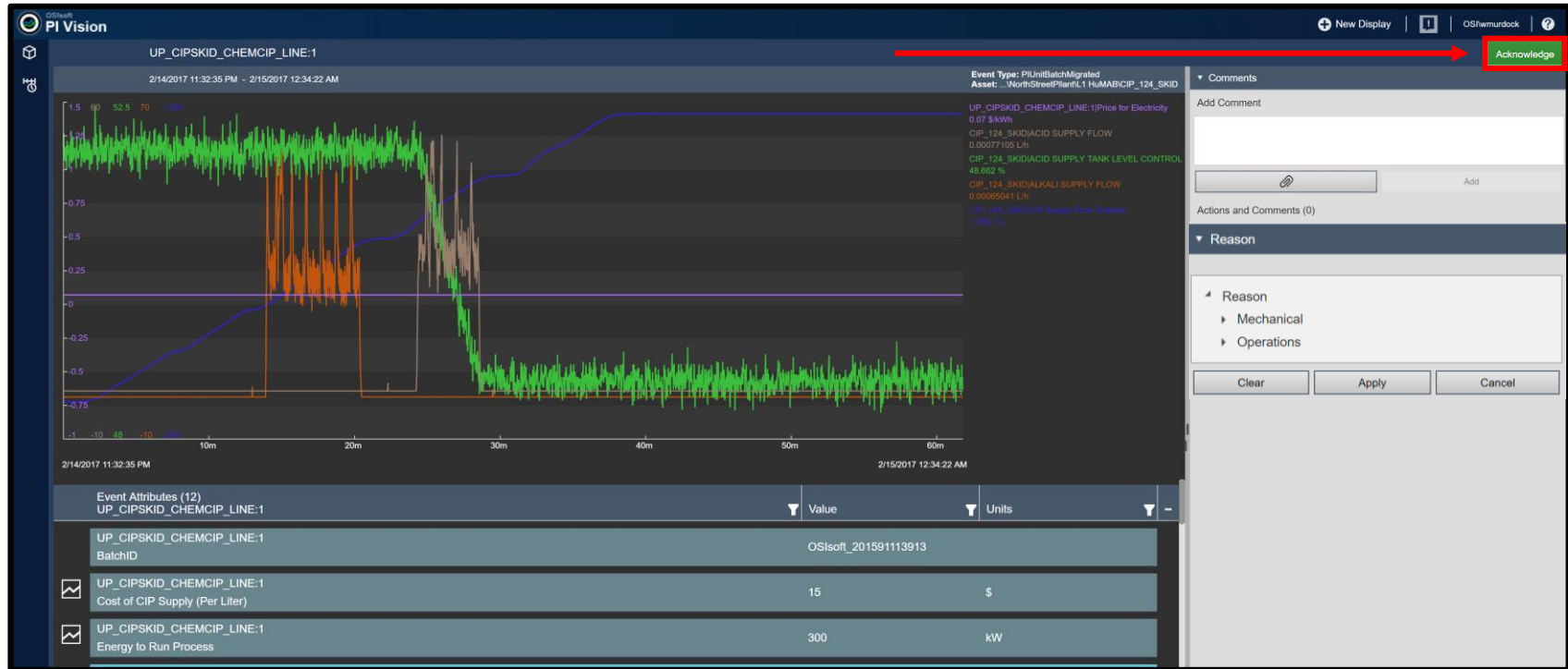
Event Frame Comparison



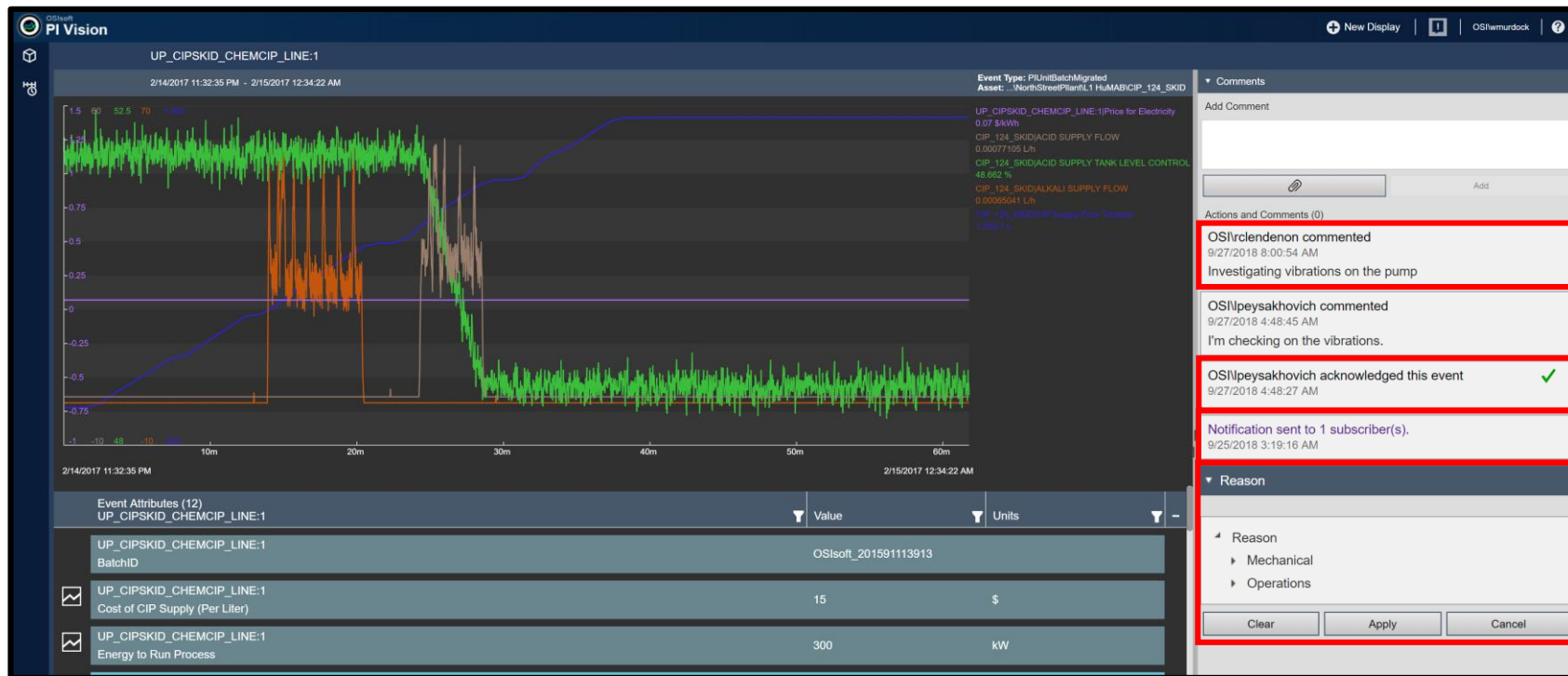
Event Details Page



Event Details Page



Event Details Page





Best Practices: Utilization



Best Practices: Utilization



INDEX IMPORTANT
ATTRIBUTES



BULK EVENT
FRAME DELETION



EVENT FRAME
SEARCHES

Index Important Attributes

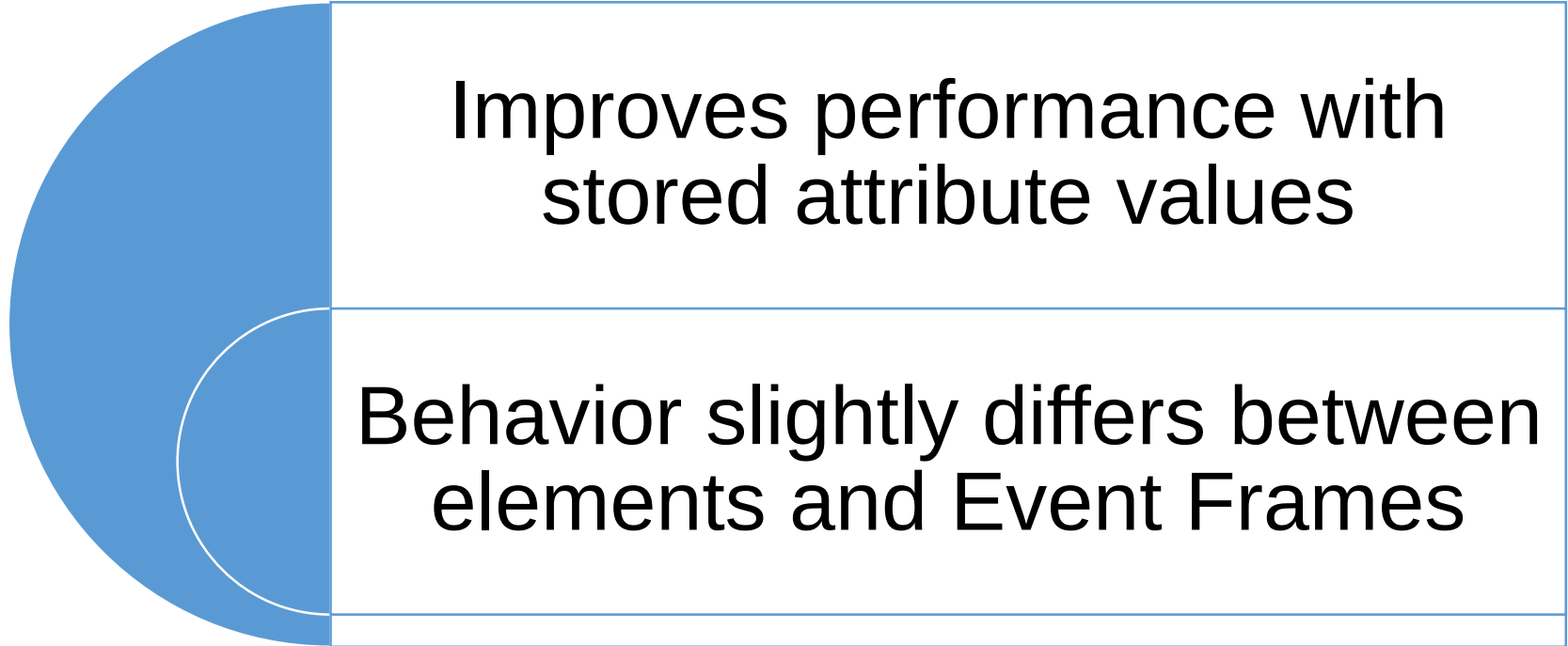
Allows for:

- Quick search results
- Fast value retrieval

The screenshot shows a configuration window for an attribute named 'Important Event Frame Attribute'. The 'Properties' dropdown menu is open, showing a list of options: Configuration Item, Excluded, Hidden, Indexed (selected with a blue checkmark), Manual Data Entry, Location, and Reason. The 'Group by' section at the top has checkboxes for 'Category' and 'Template', both of which are unchecked. The 'Name' field contains 'Important Event Frame Attribute' and the 'Description' field is empty. Other fields like 'Categories', 'Default UOM', 'Value Type', 'Default Value', 'Data Reference', and 'Display Digits' are visible but not filled out.

Field	Value
Group by:	☐ Category ☐ Template
Name:	Important Event Frame Attribute
Description:	
Properties:	Indexed
Categories:	
Default UOM:	
Value Type:	
Default Value:	
Data Reference:	
Display Digits:	

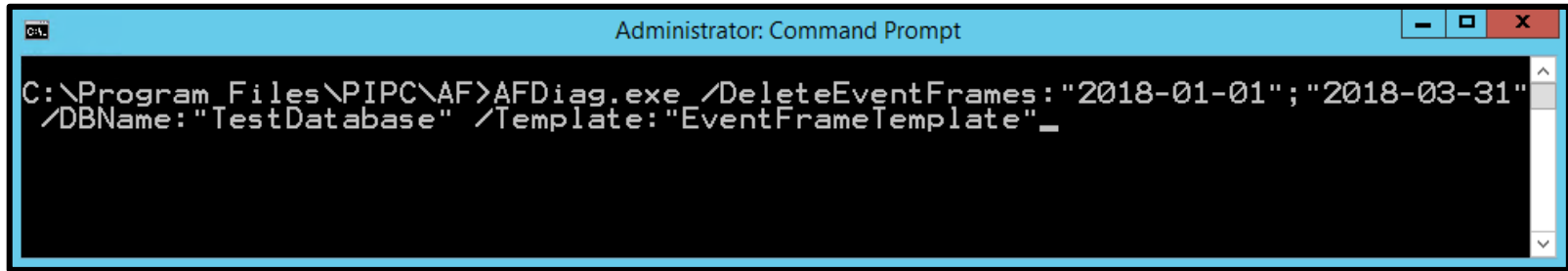
Index Important Attributes



Bulk Event Frame Deletion

- AFDiag command line utility
- Example:

*AFDiag.exe /DeleteEventFrames:"2018-01-01";"2018-03-31"
/DBName:"TestDatabase" /Template:"EventFrameTemplate"*



The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The command entered is: `C:\Program Files\PIPC\AF>AFDiag.exe /DeleteEventFrames:"2018-01-01";"2018-03-31" /DBName:"TestDatabase" /Template:"EventFrameTemplate"`. The command is followed by a cursor. The window has a blue title bar and standard Windows window controls (minimize, maximize, close) in the top right corner.

Event Frame Searches



Utilize Indexed Attributes



Latest release improved simple queries (time range + 1 attribute)



Event Frame Template Hierarchies



Summary



Building Event Frame Context



Define business
case



Create
measurable
objectives



Event Frame
implementation



Event Frame
Evaluation

Key Takeaways



START WITH THE
'WHY'



BUSINESS CASE IS
KEY!



EACH EVENT FRAME
SHOULD
CONTRIBUTE TO
OVERALL GOAL



CAPTURE
MEANINGFUL DATA –
NOT ALL DATA

Key Takeaways



CONTEXT CAN
CHANGE OVER TIME



CRITICAL EVENTS
CAN CHANGE OVER
TIME



EVALUATION
PROCESS IS
NECESSARY!

Contact Information

Zahab Nabeel

znabeel@osisoft.com

Systems Engineer

OSIssoft



Communicate with OSIsoft Product Managers



<https://feedback.osisoft.com>

If it is not shared on the feedback portal, it didn't happen!



Questions?

Please wait for
the **microphone**

State your
name & company



Please remember to...

Complete Survey!

Navigate to this session in
mobile agenda for survey

