Incorporate Event Frames into your Operations

Ellery Murdock

Introduction

Ellery Murdock
wmurdock@osisoft.com
Technical Product Manager
OSIsoft

Agenda

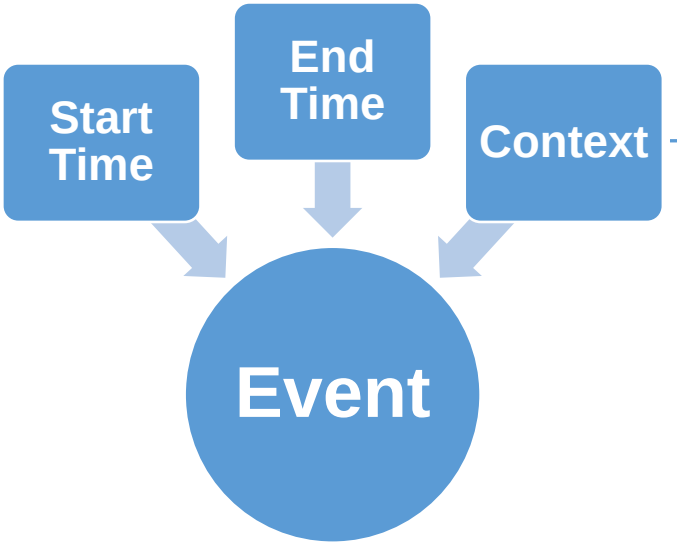
- Introduction
- Event Frame Context
- Best Practices
- Summary

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

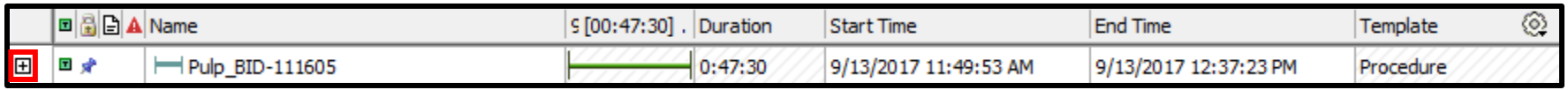
Asset(s) associated to the event

Text entries useful for filtering/group-by analysis

Placeholders for **manual data entry**

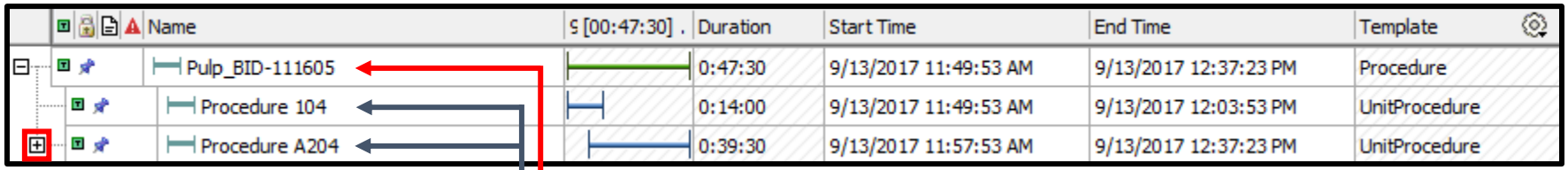
Calculated data using event start & end time context

Event Frame Introduction



	Name	9 [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

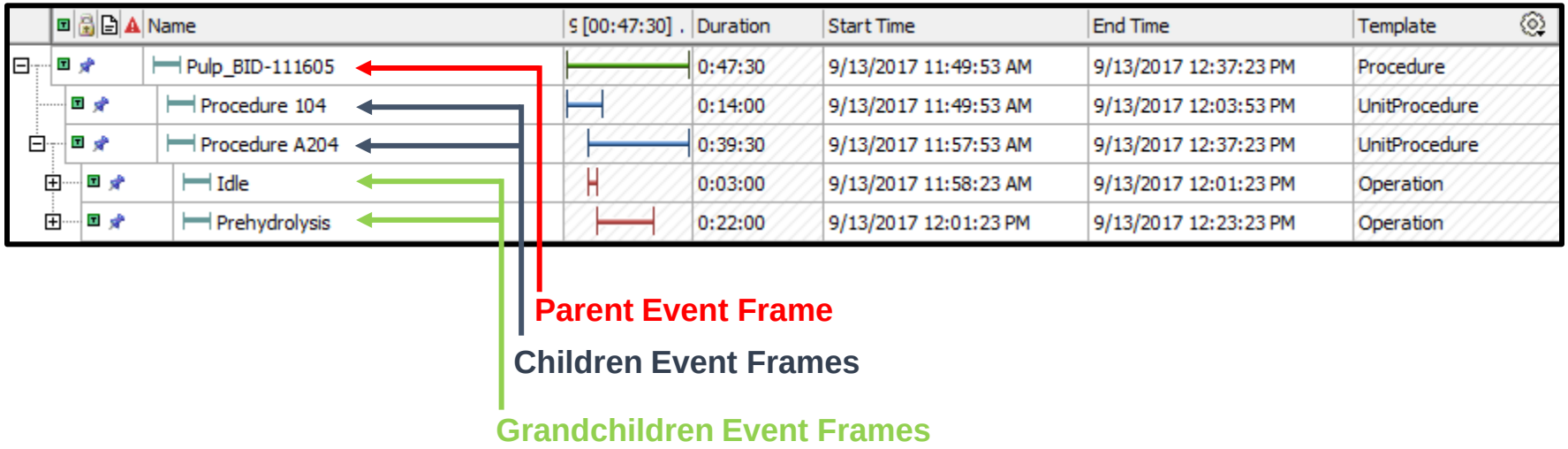
Event Frame Introduction



Parent Event Frame

Children Event Frames

Event Frame Introduction



Event Frame Introduction

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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

Asset Analytics

- Configuration Options
  - Event Frame Template
  - Scheduling
- Event Frame Definition
  - Start/End Trigger
  - Additional Variables
  - Outputs at close

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

- Define business case
- Create measurable objectives
- Event Frame implementation
- Event Frame Evaluation

Define Business Case

- Goal or objective
  - Problem or opportunity
- Positive commercial or internal impact
- Realistic time horizon
- Define audience / impacted persons
- Involved Risk

Create measurable objectives

- Application of data to business case
- Tangible outcomes
- Event Frames Utilization
  - Event Frame count
  - Attributes
  - Summary information

Event Frame Implementation

- Event Frame templates
  - Correlate attributes to measurable objectives
- Verify Event Frame creation method
- Event Frame testing and recovery

Event Frame Evaluation

- Event Frame verification:
  - Measurable objectives met
  - Events created on time and when appropriate
  - Each Event has a direct impact on business case
- May need to revisit previously defined steps

Building Event Frame Context Example

- **Business case:** Pump Downtime Alarm
- Problem!
- Internal **and** customer impact
- Effective immediately
- Audience – Equipment operators
- Low risk

Building Event Frame Context Example

- **Measurable Objectives:**
  - Event Frame that spans downtime
  - Each Event needs:
    - Downtime reason code
    - Downtime duration
    - Important process parameters affected

Building Event Frame Context Example

- **Event Frame Implementation:**
  - Define EF template
  - Analysis on pump element
    - Reads status codes
  - Attributes
  - Recovery mode
- **Event Frame Evaluation:**
  - Business case met?
  - Measurable objectives met?
  - EFs created appropriately?

Building Event Frame Context Takeaways

- Start with the ‘Why’
- Business case is key!
- Each Event Frame should contribute to overall goal

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
- Data Archive – All data
- Asset Framework – Context, Metadata
- 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
  - PI EFGen config nodes

Result

- Addition and deletion:
  - Templates
  - Analyses
- Bulk Event Frame recovery/deletion
- Refined business cases

Customer Hesitancy

- “We may need these in the future”
- Repeat evaluation process and update accordingly

Customer Hesitancy

- “These Event Frames are essential to our operation”
- What business case is directly impacted?

Customer Hesitancy

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

- Evaluation process!
- Business case application!

Customer Hesitancy

- “Too much time and effort to change the status quo”
- How and when are changes made?

Common Mistakes

- How many events can I create?

What events will you use?

Common Mistakes

- Can I capture everything?

No. Start with what is needed to meet current goals and objectives!

Capture Meaningful Takeaway

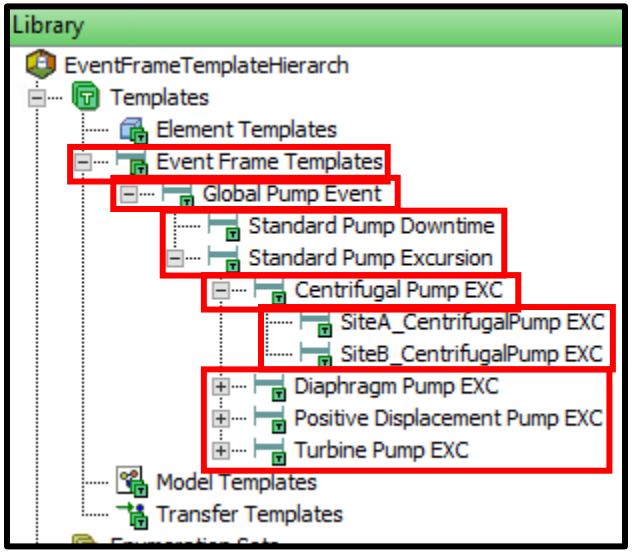
- Capture *meaningful* data – not *all* data
- Leverage business case accordingly
- Utilize the strengths of the PI System
  - Event Frame recalculation/recovery

Best Practices: Creation

Best Practices: Creation

- Derived Templates
- Event Frames with Varying Severity
- Event Frame Calculations

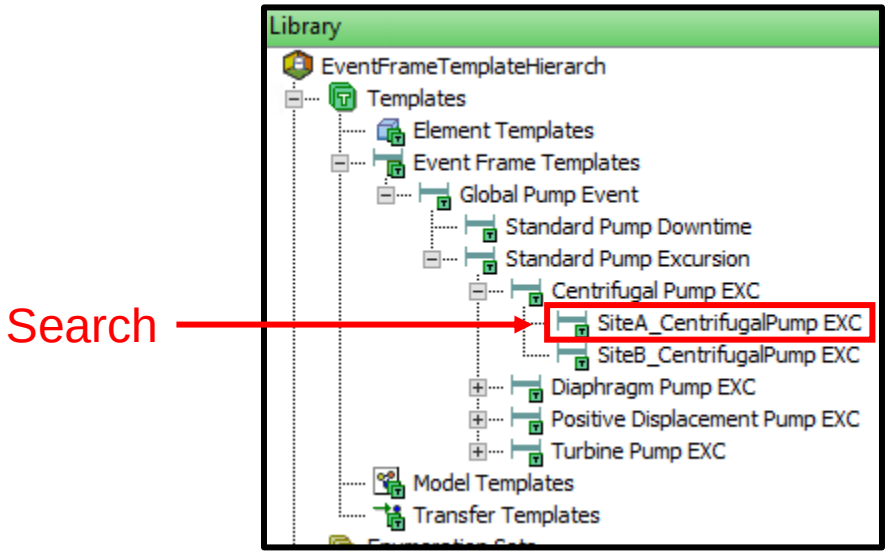
Derived Templates



Derived Templates

- Create Event Frame Template Hierarchy
- Enables:
  - Efficient searching
  - Comprehensive results
  - Standardized Event Frames and Attributes

Derived Templates



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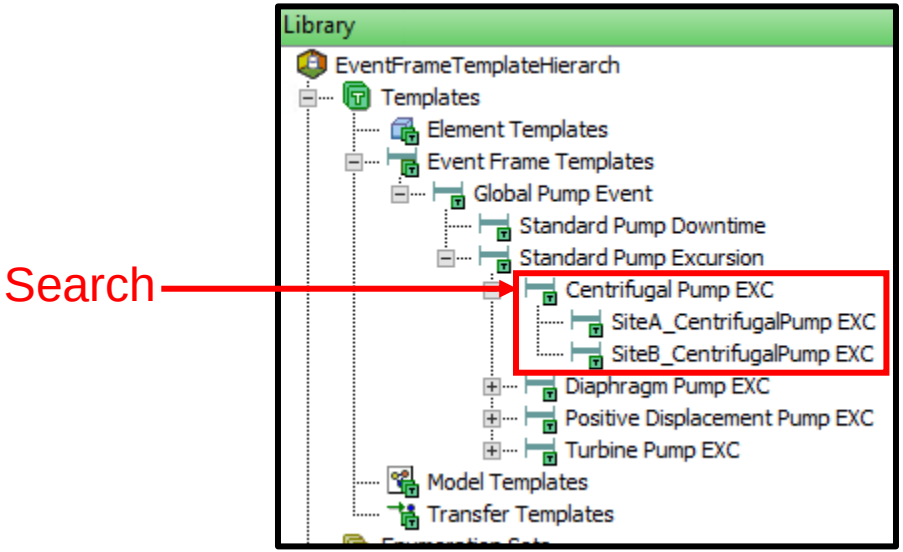

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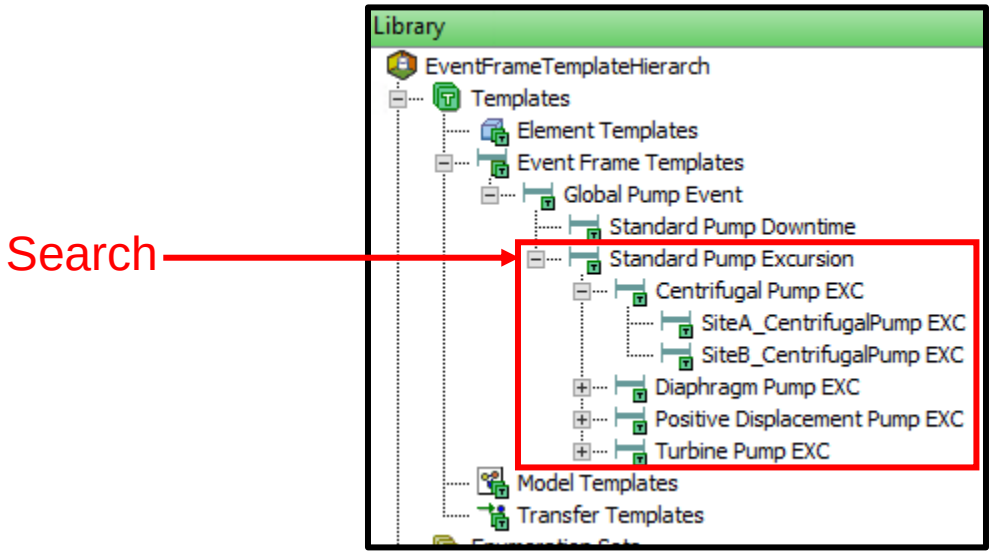
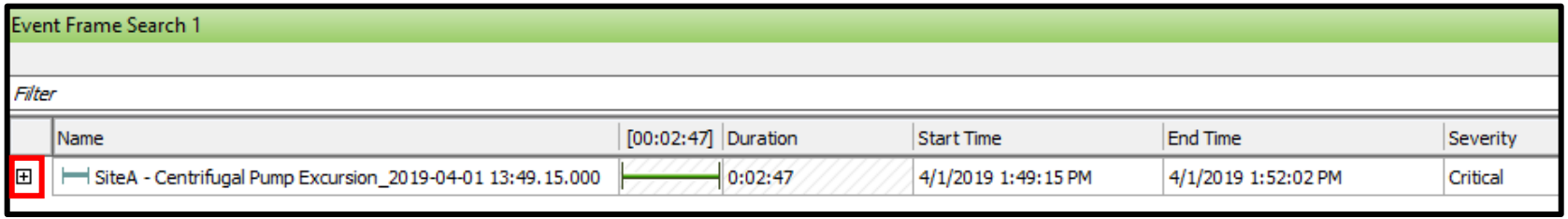


Event Frames with Varying Severity



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

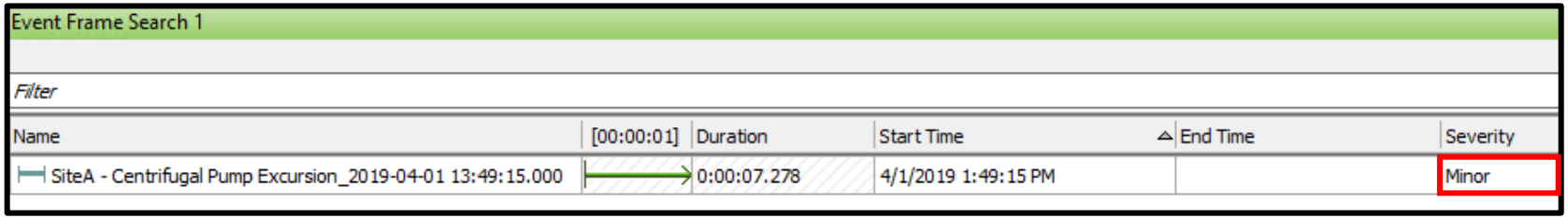
- Create multiple child Event Frames
  - Single start trigger needs to be true
  - Only create direct children

- Ideal use cases:
  - Increasing/decreasing severity alarms
  - Simple process monitoring
  - “Grouped alarm” scenario

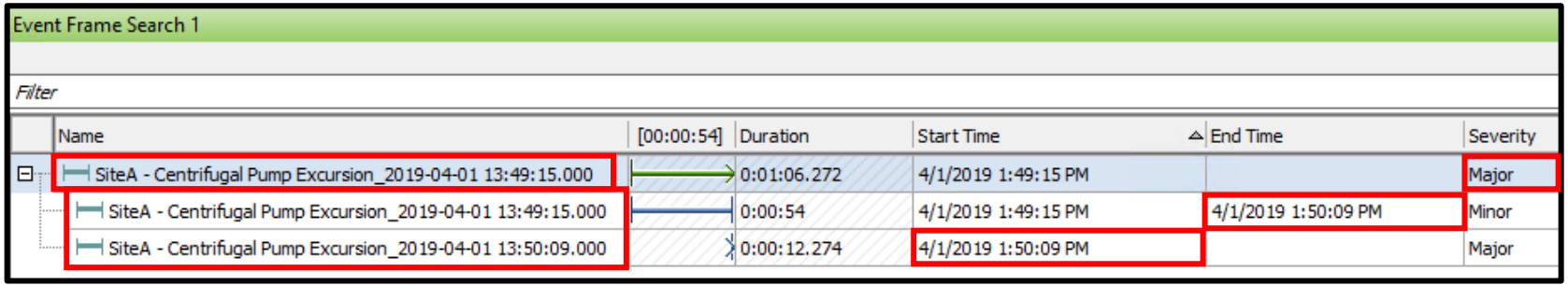
Event Frames with Varying Severity

- Create multiple start triggers
  - Minor Severity – Pump Speed greater than HI limit
  - Major Severity – Pump Speed greater than HIHI limit
  - Critical Severity – Pump Speed greater than maximum limit

Event Frames with Varying Severity



Event Frames with Varying Severity



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

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

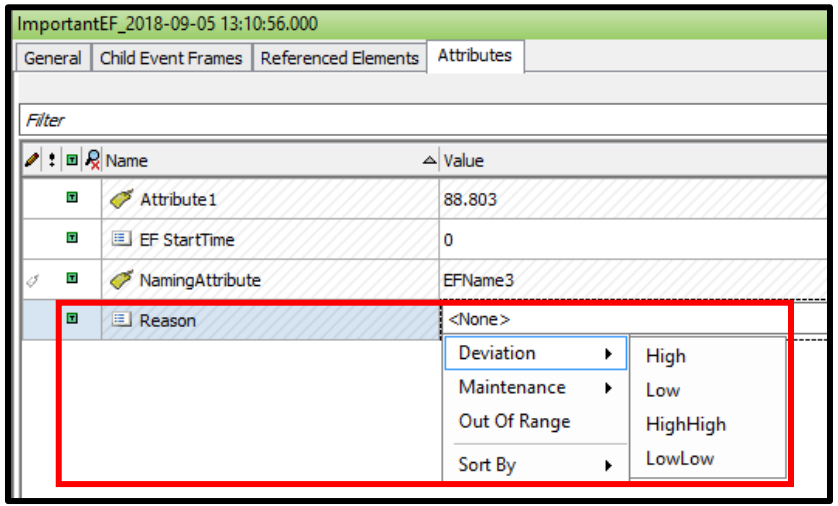
- Reason Codes
- Pinned Events
- Event Frame Comparison
- Event Frame Details

Reason Codes

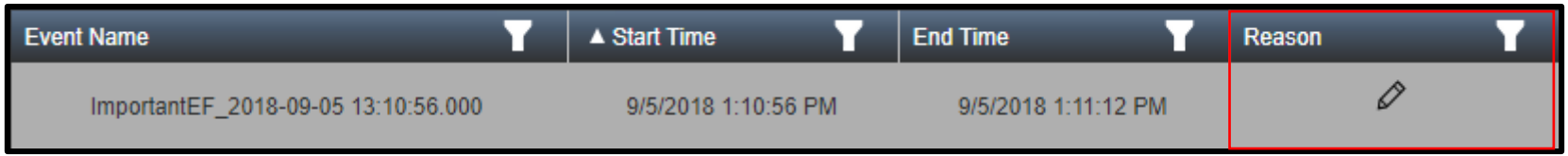
- How can we write back to Event Frames?
- How can operators update Event Frames with pertinent information after the fact?

Reason Codes

- Write back to Event Frames
- Select options from multi-tiered enumeration set

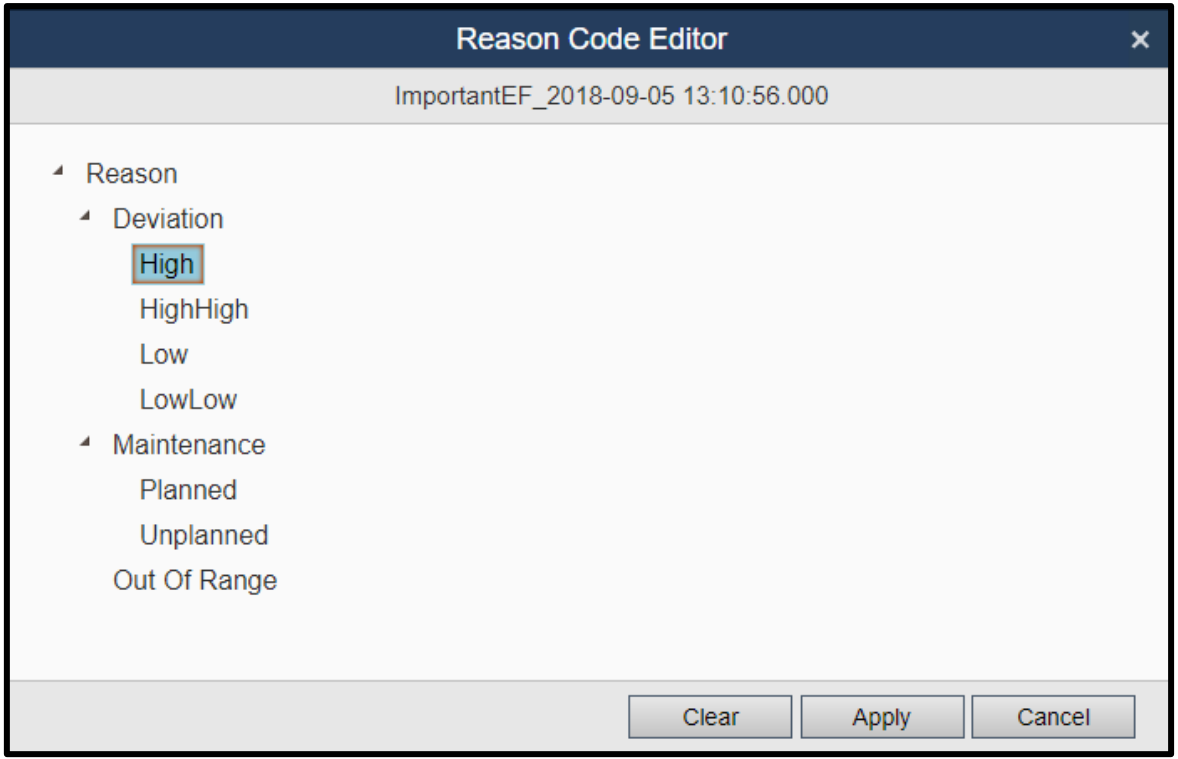


Reason Codes



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	

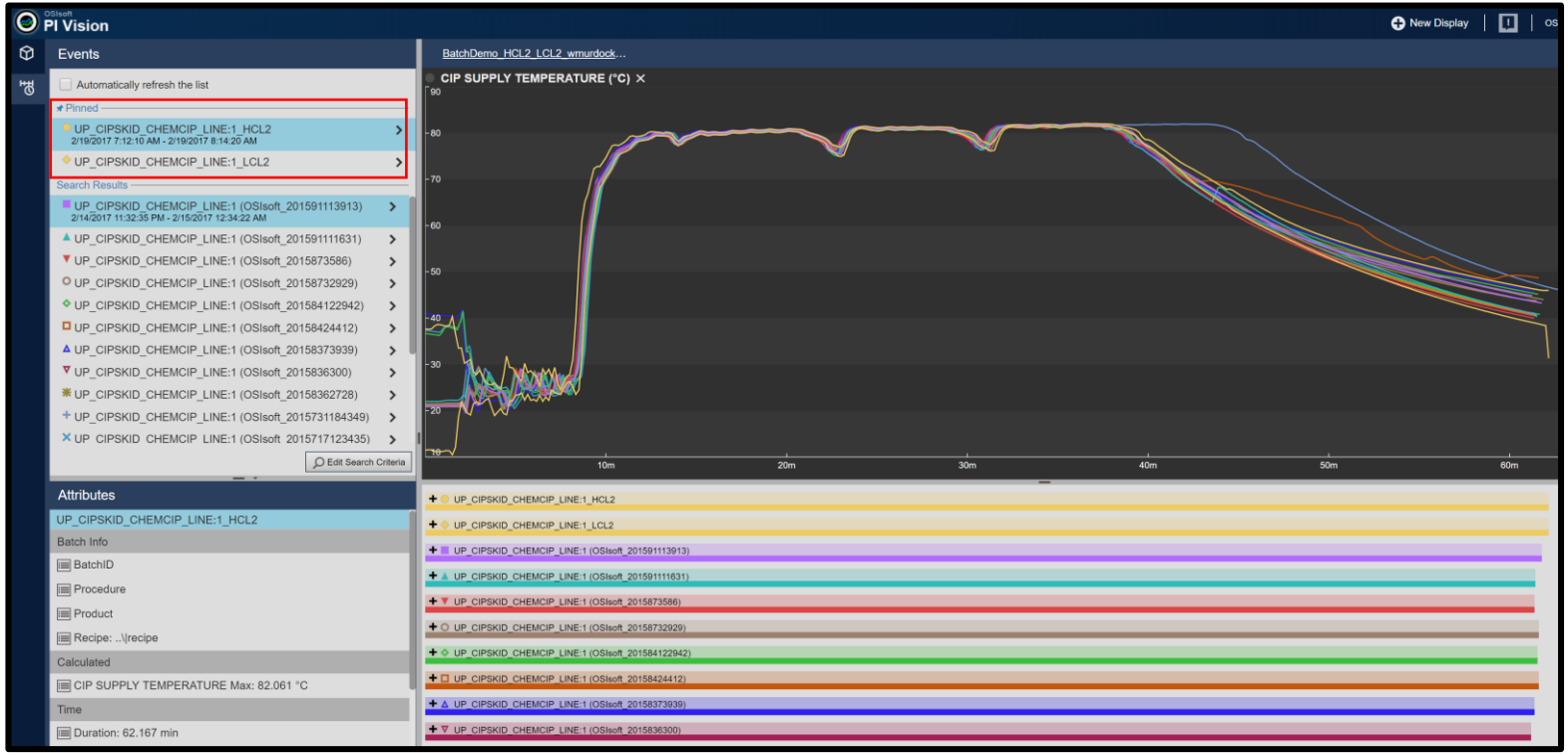
Reason Codes



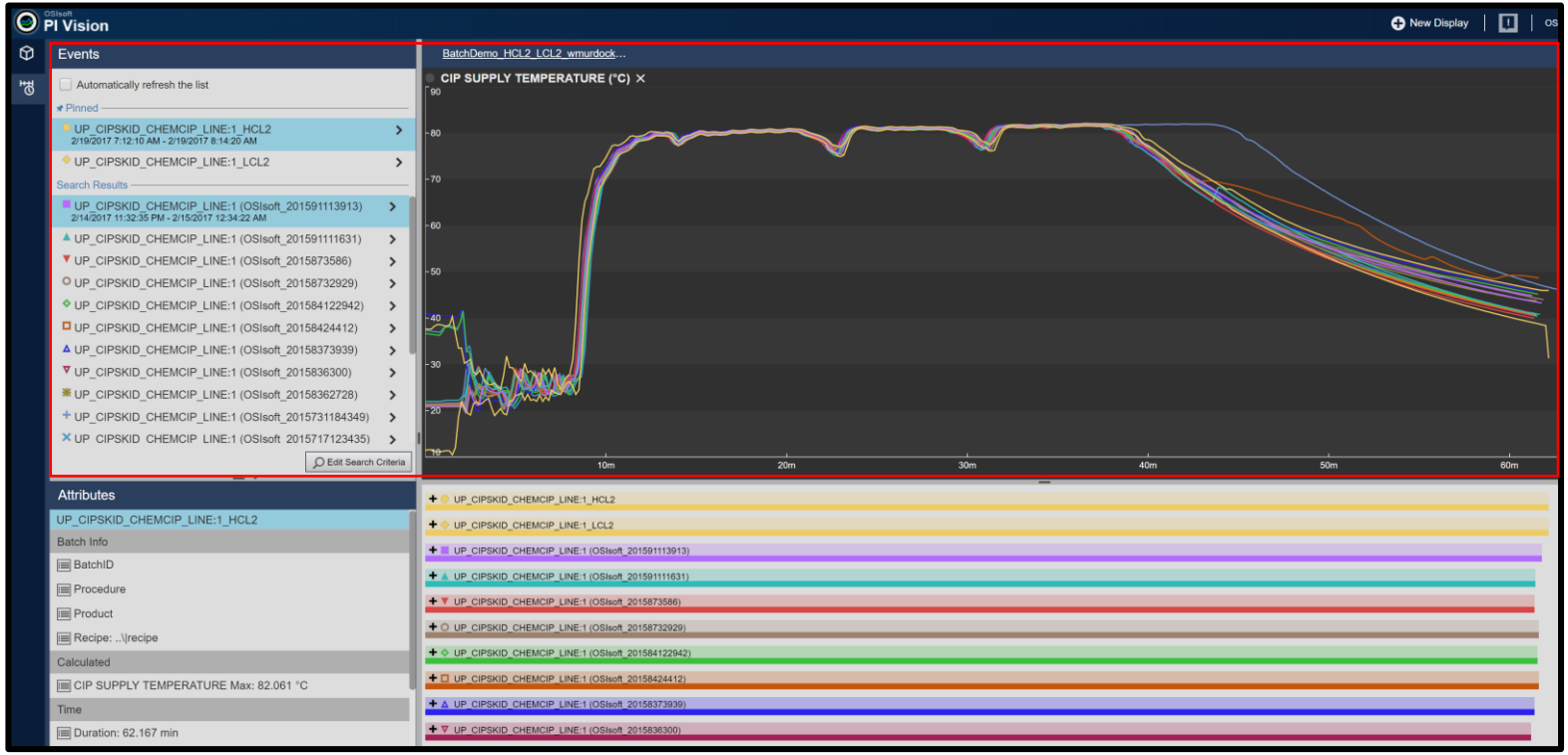
Reason Codes

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



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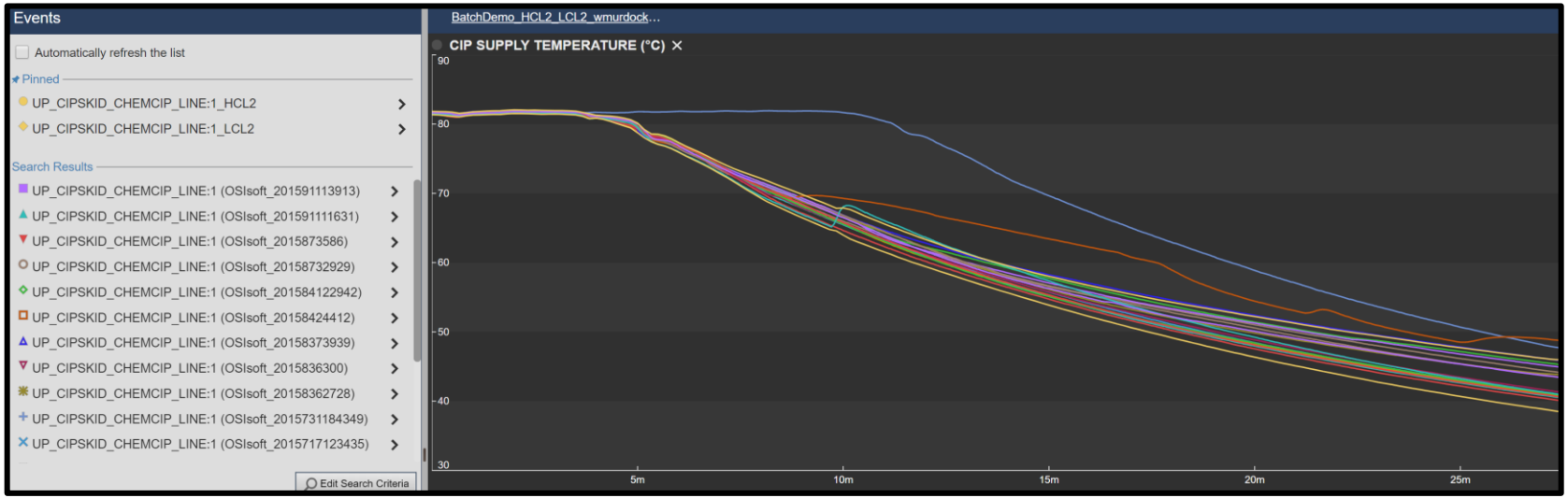

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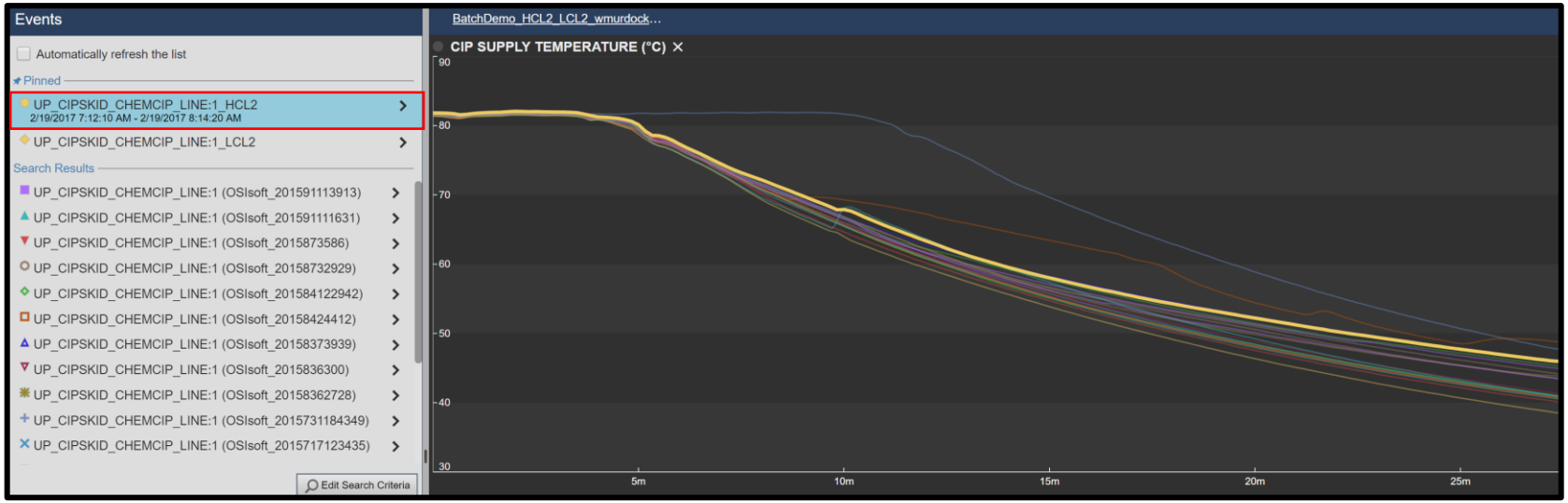

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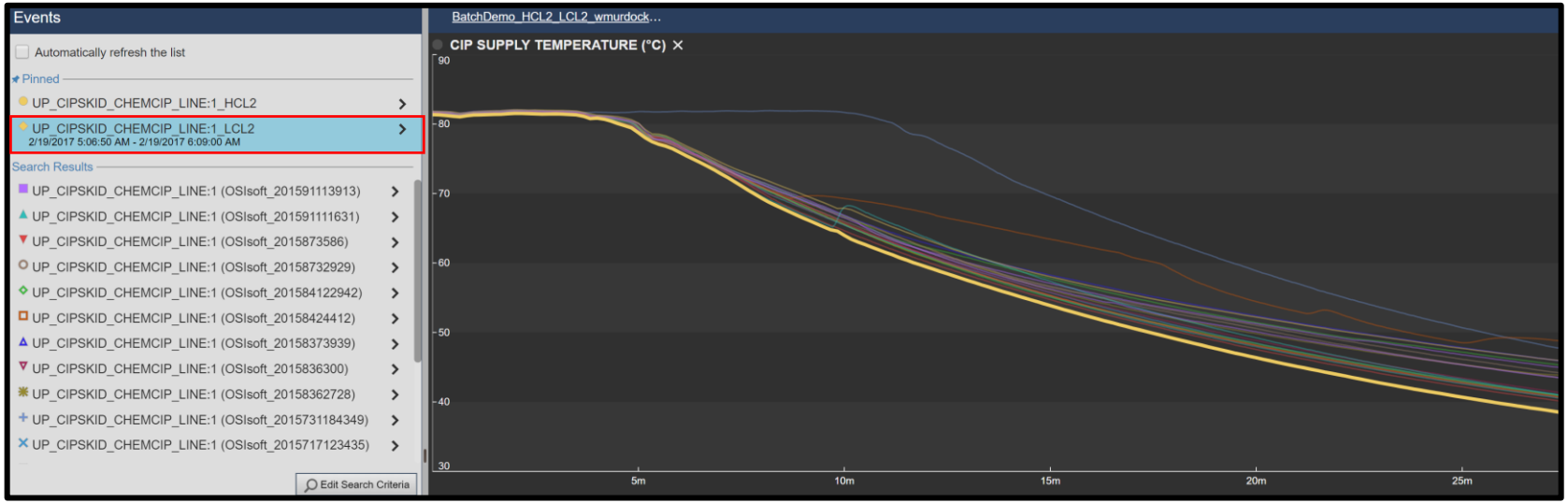

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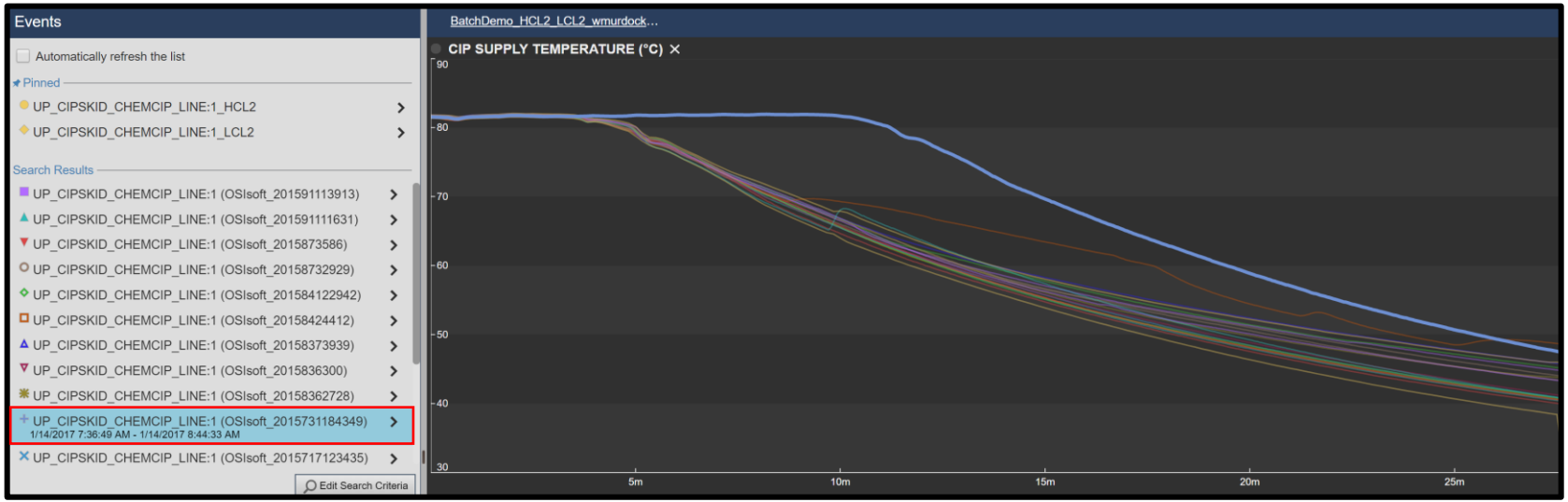
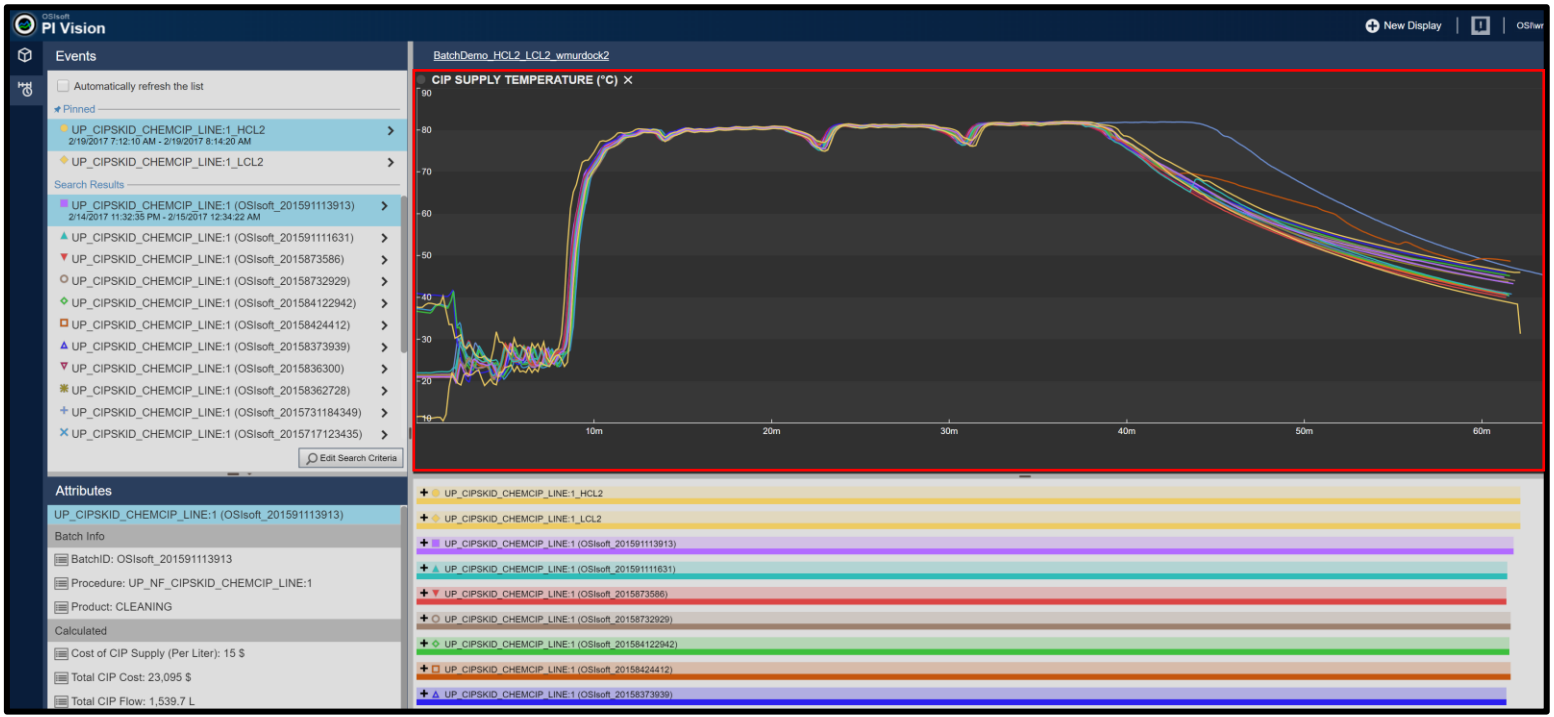


Event Frame Comparison

- View and analyze data within Event time range
- Context visualization
- Utilizes the power of templates
  - Compare like events
  - Analyze root cause

Event Frame Comparison



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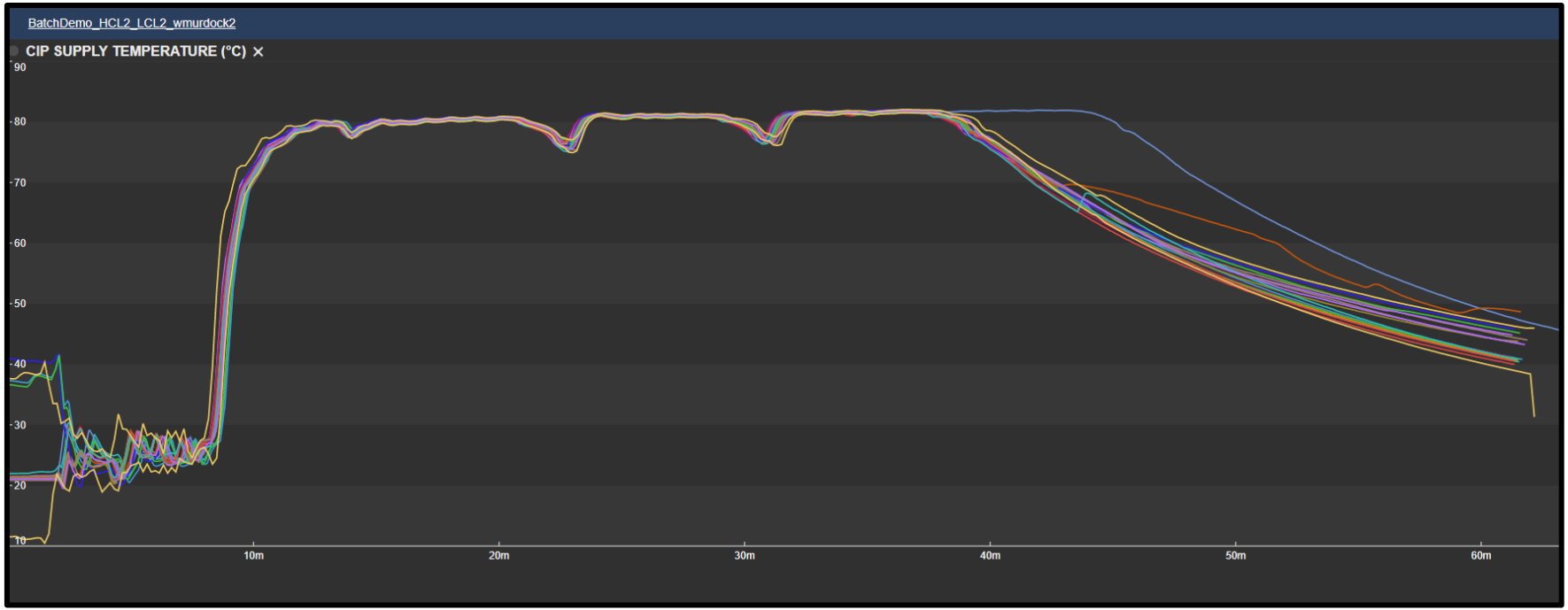

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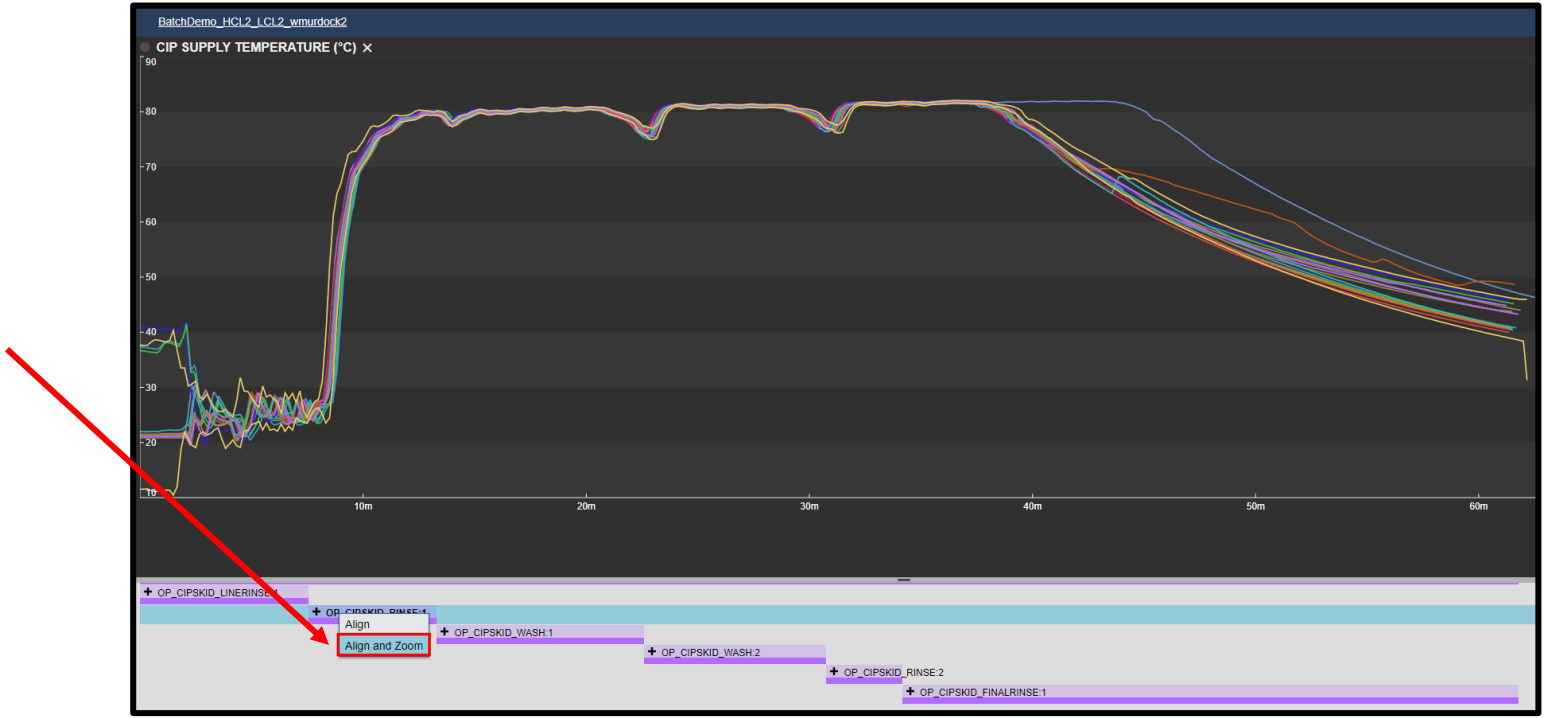

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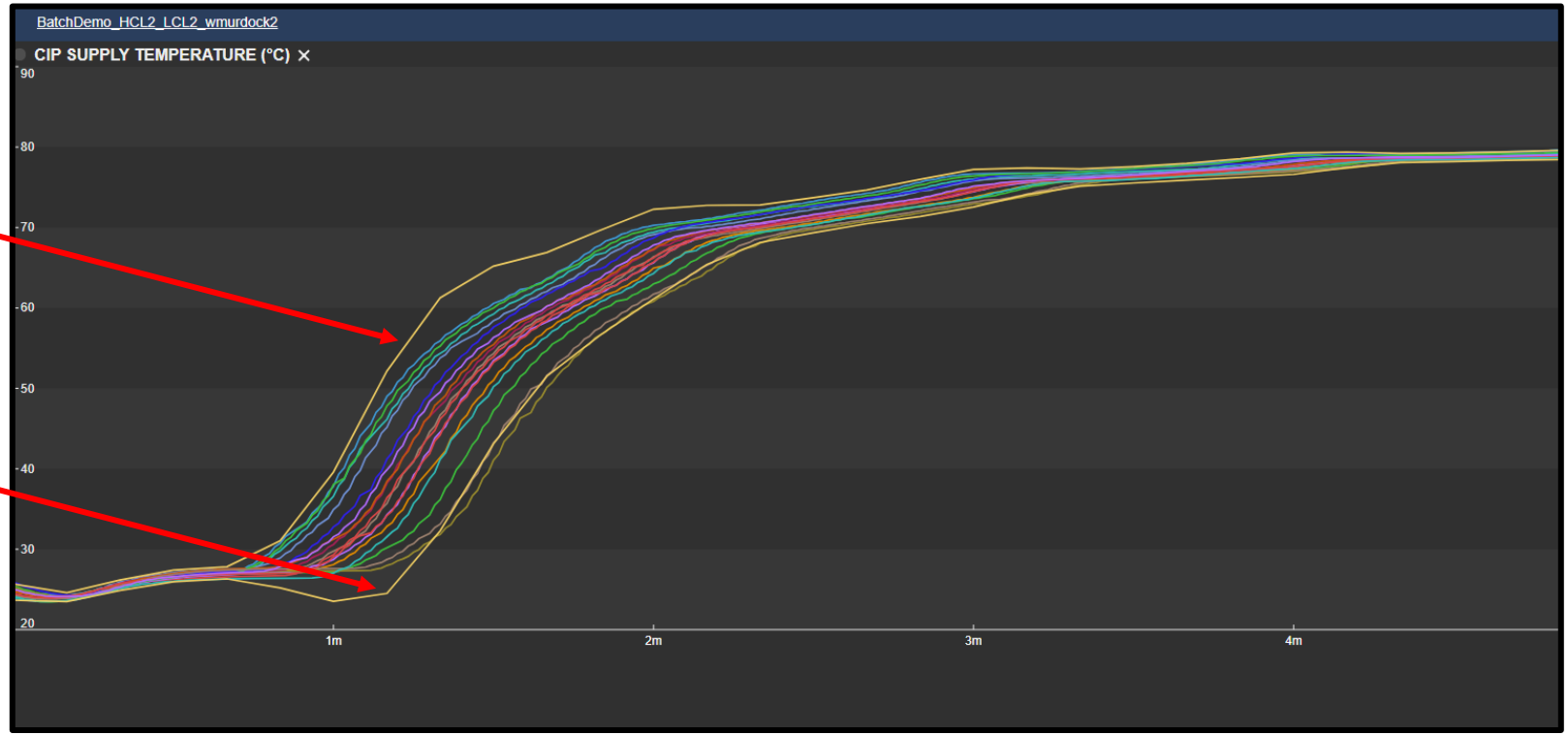

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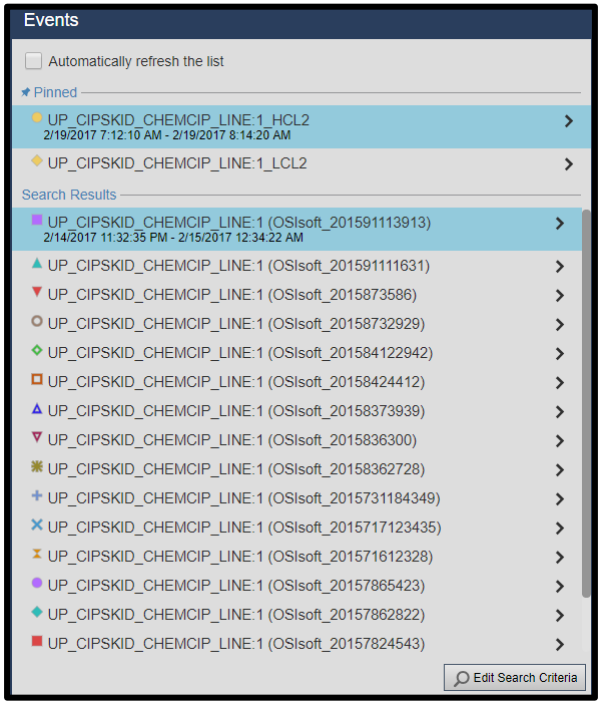

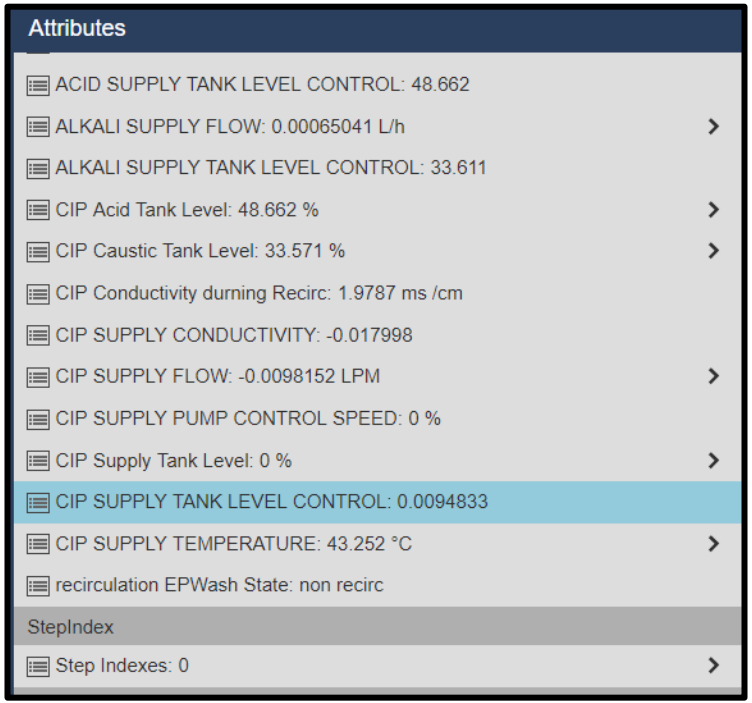

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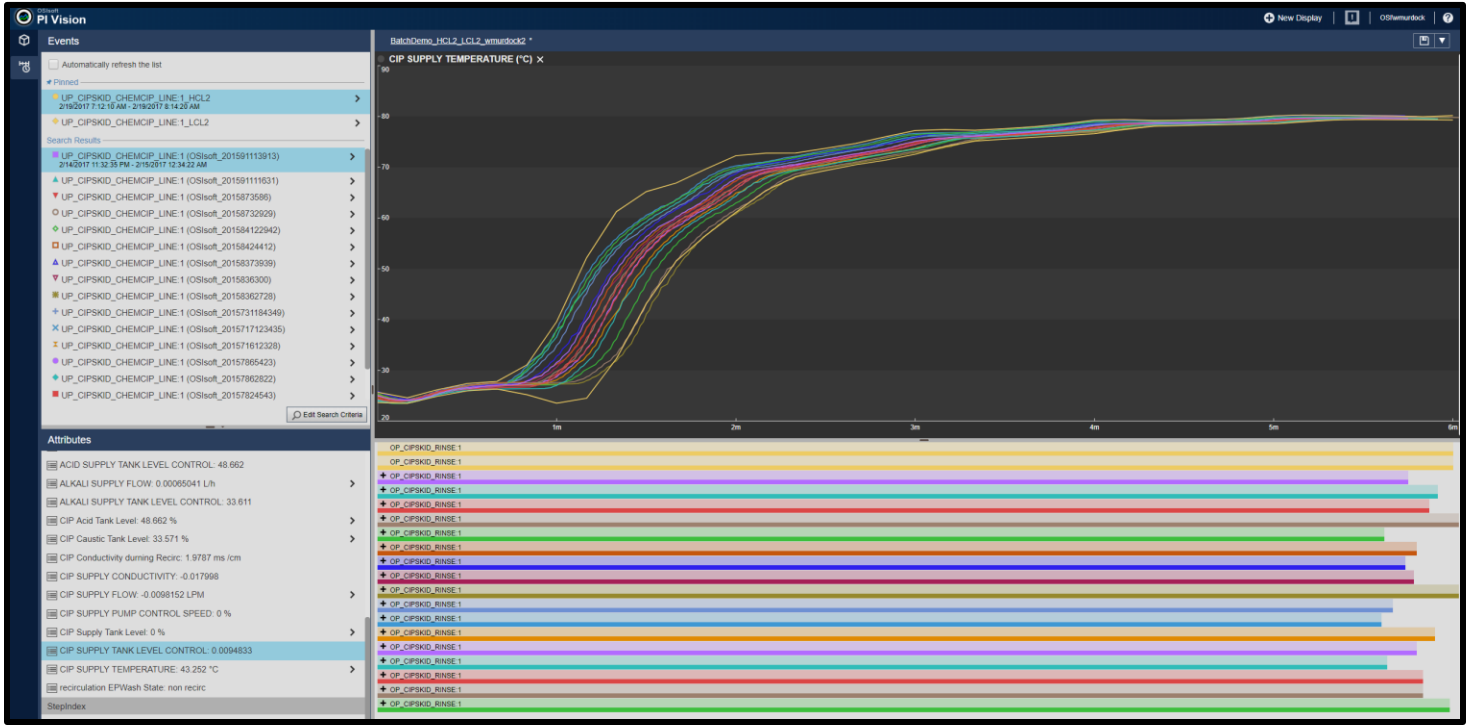

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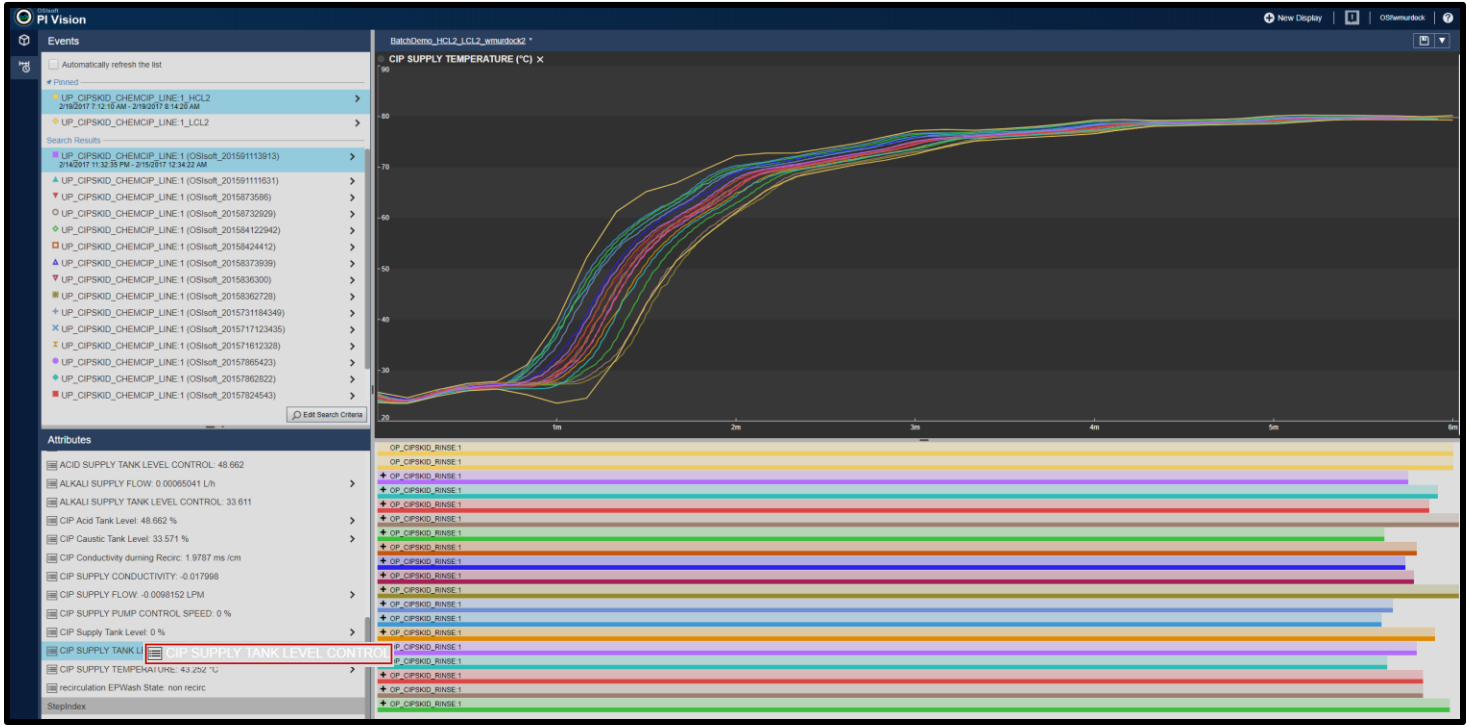

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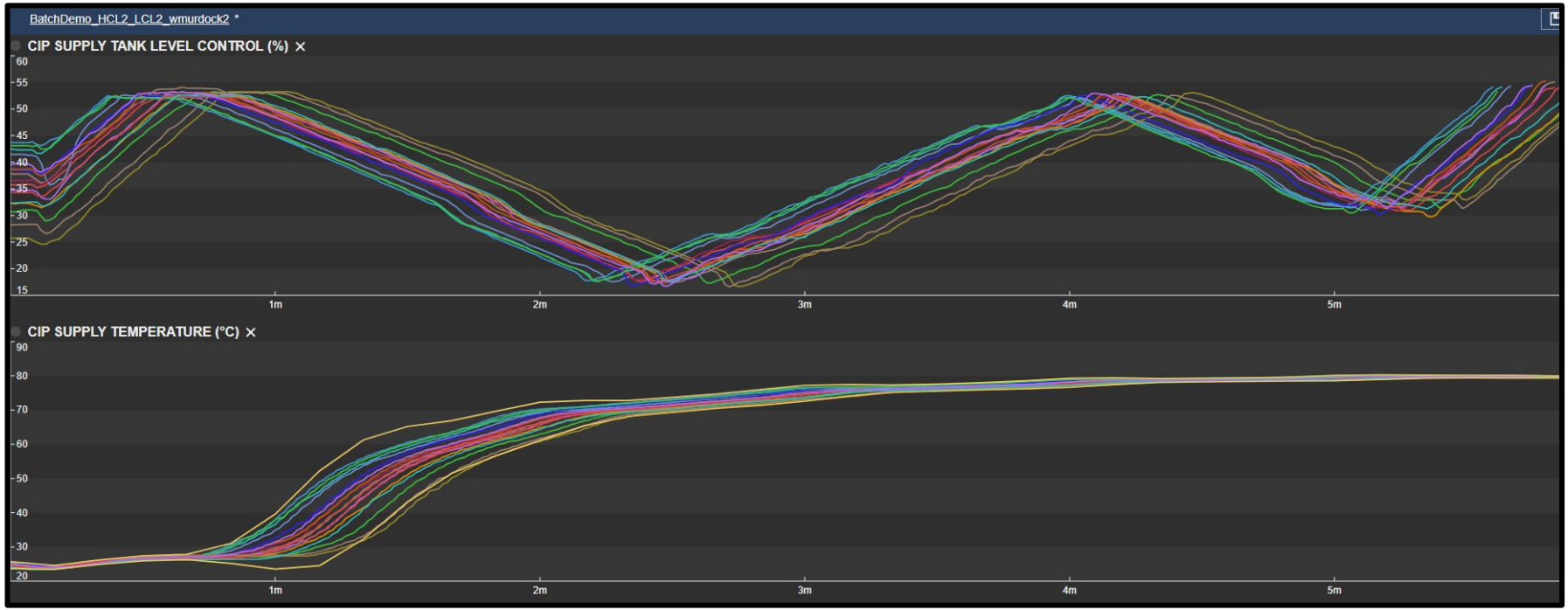
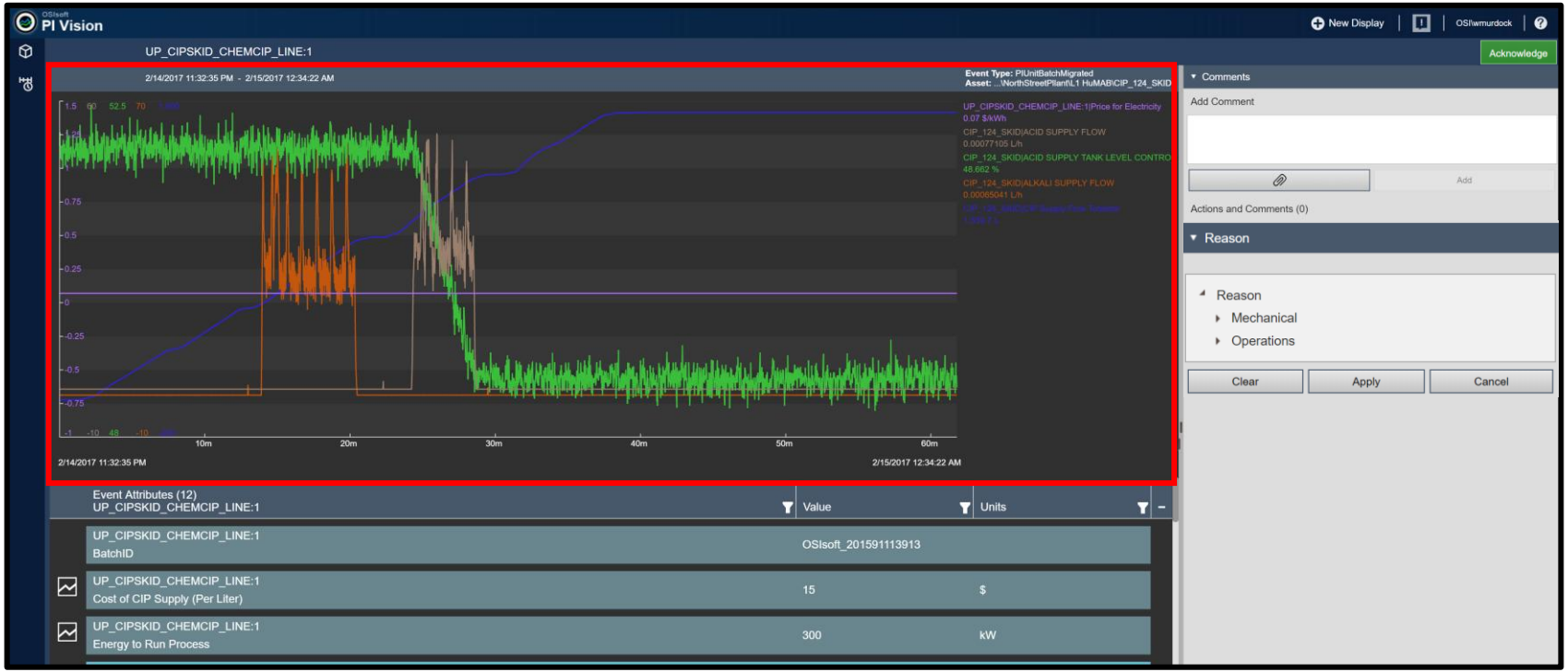


Event Details Page



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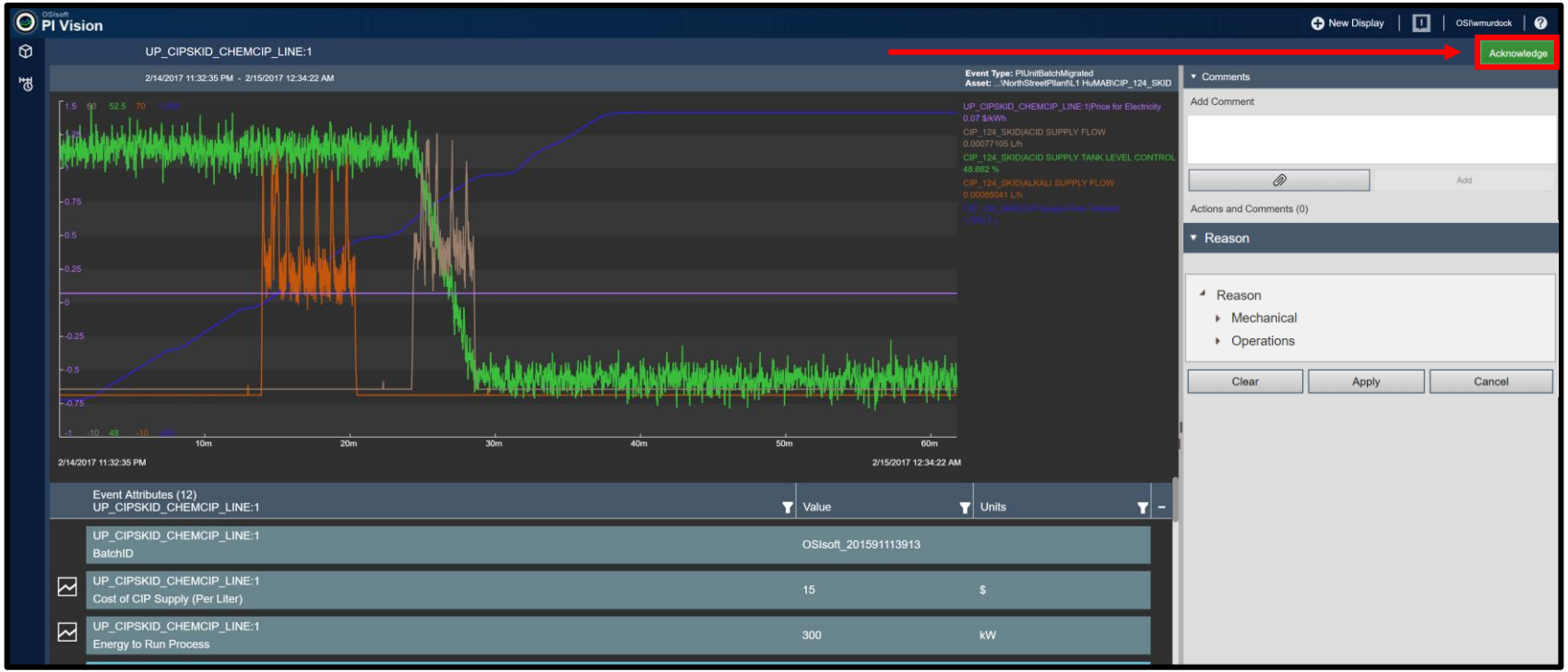

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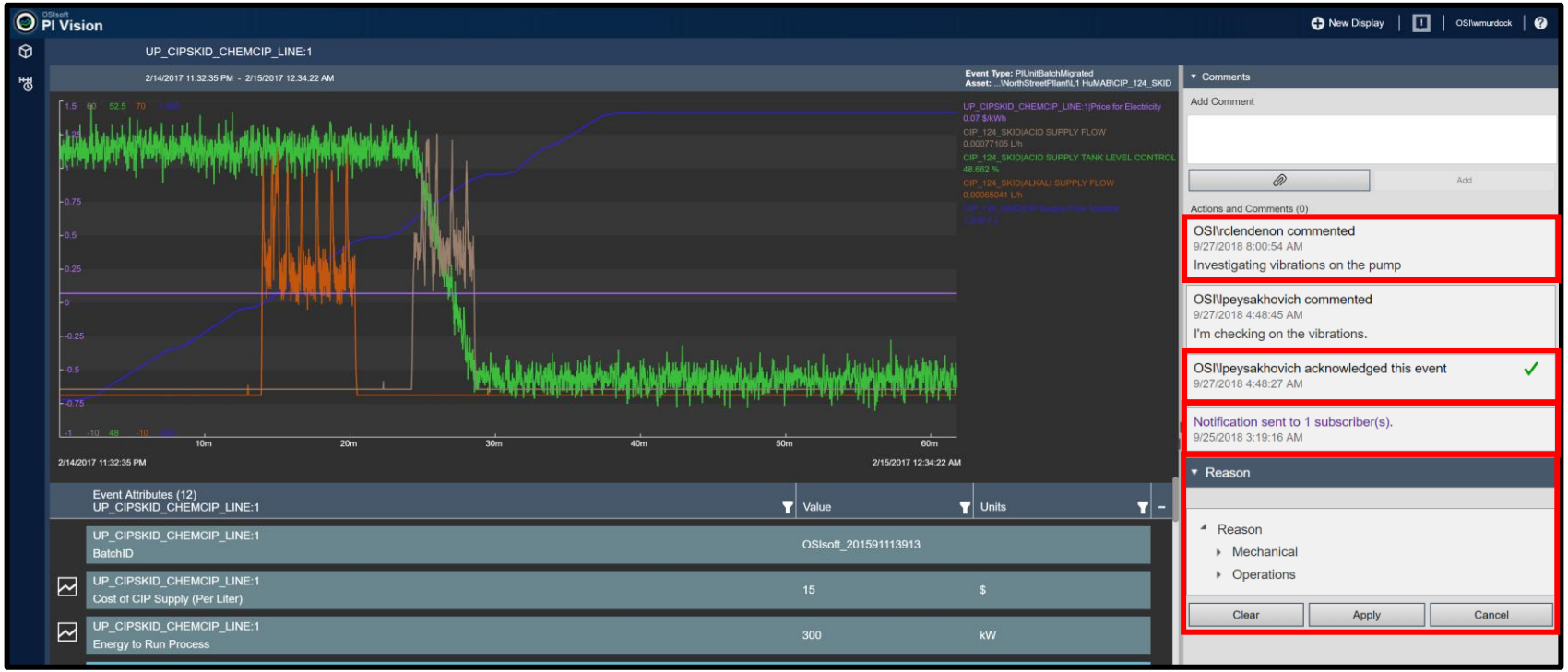


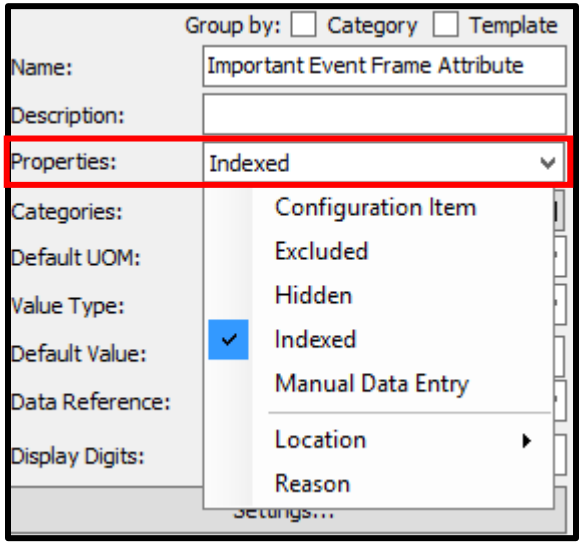
Best Practices: Utilization

Best Practices: Utilization

- Index Important Attributes
- Bulk Event Frame Deletion
- Event Frame Searches

Index Important Attributes

- Allows for:
  - Quick search results
  - Fast value retrieval
- Index attributes that users are likely to search for frequently



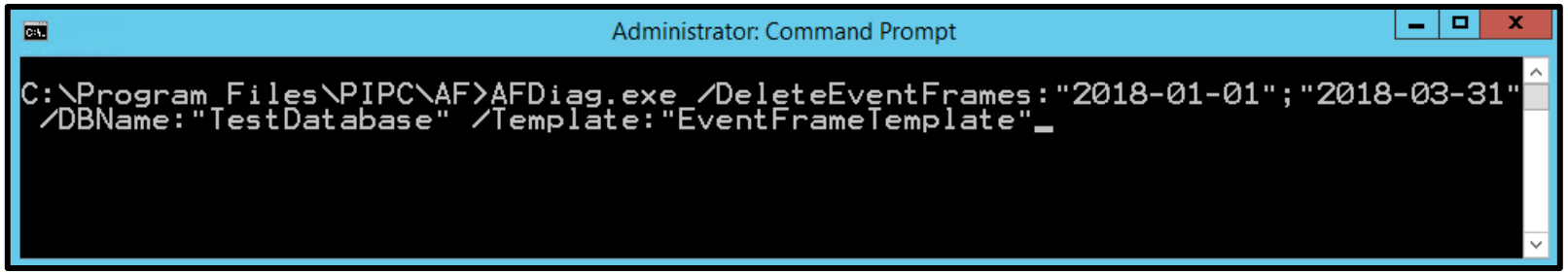
Index Important Attributes

- Improves performance with stored attribute values
- Behavior slightly differs between elements and Event Frames

Bulk Event Frame Deletion

- AFDiag command line utility
- Example:

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



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

Summary

- Best practices:
  - Creation
  - Visualization
  - Utilization
- No *one right way*
- Combination of best practices is key

Summary

- Context can change over time
- Critical events can change over time

- Evaluation process is necessary!

Speaker Information

- Ellery Murdock
- Technical Product Manager
- OSIsoft
- wmurdock@osisoft.com

Communicate with OSIsoft Product Managers

https://feedback.osisoft.com

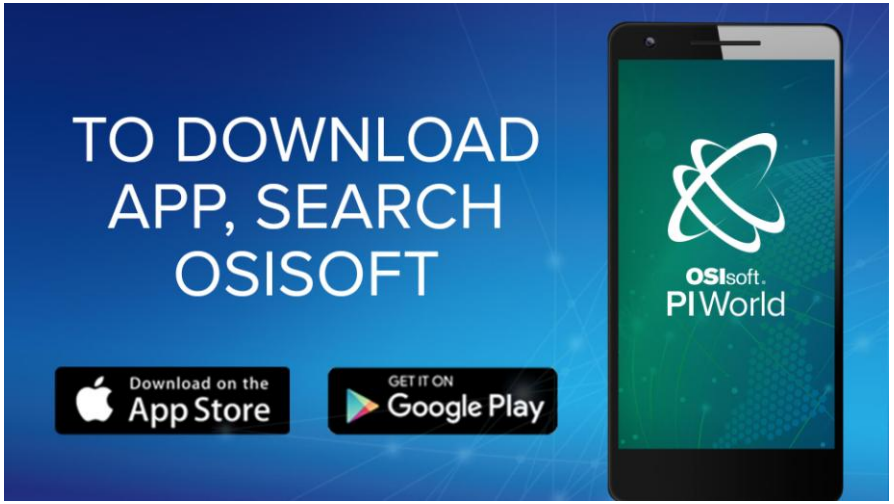
If it is not shared on the feedback portal, it didn't happen!

Questions?

Please wait for the **microphone**

State your **name & company**

Please remember



IT'S THROWBACK THURSDAY AT GEEK NIGHT TONIGHT!

Hilton – Grand Ballroom 7:00 – 10:00 PM

PARTNER & PRODUCT EXPO

Today's Expo Hours

10:00 am – 3:00 pm

Golden Gate and Yosemite

LUNCH IN TWO LOCATIONS TODAY

General Attendee Lunch – Hilton

Developer Lunch – Parc 55