

NOVEMBER 16, 2022

Leveraging the AVEVA Portfolio to Provide Operational Analytics and Optimization

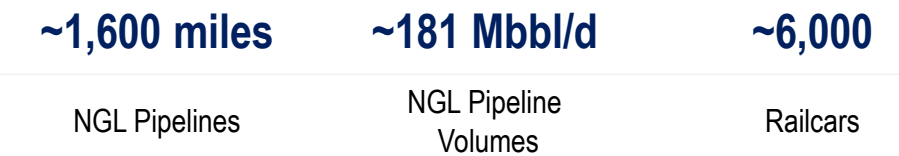
“Power to the SMEs” – capturing knowledge, enabling self-serve, & generating synergy value from the AVEVA Portfolio

The AVEVA logo, consisting of the word "AVEVA" in a bold, white, sans-serif font.

AGENDA

- About Plains
- Our Journey with the AVEVA Portfolio
- PI System architecture
- Overview of our IT/OT Ecosystem
- Use Cases
- Thoughts on Best Practices & Lessons Learned
- Where are we headed...
- Q&A

TRANSPORTATION



NGL Storage	Crude Oil Storage
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~6 BCF	~222 Mbbl/d	5
Gas Processing Capability	NGL C3+ Fractionation Capacity	Gas Straddle Plants



From Customer to Strategic Partner



1998-2007

5.0 series Unix and converted to 6 series SCADA

2009

Upgrade to Bragg Creek Edition of SCADA.
SimSuite Leak Detection
PI Archive Setup

2010

Start Utilizing applications with PI Native APIs

2014

Upgrade to OASys DNA Columbia Edition
64 Bit SimSuite (LDS)
Upgrade of PI Archive

2020

Embarked on PI Enterprise Journey
PI CoP Established

Upgrade to Enterprise SCADA 2018 complete.
PAA shares LD Tools with AVEVA
Elite Customer Agreement with AVEVA

2021

Upgrade to Enterprise SCADA 2021
HMI 2021
Pipeline Integrity Monitor 2.0

North American PI system.
North American Leak Detection Systems and so on...

2022 onwards



Our journey with Valmet, Metso, Telvent, Schneider Electric Software, OSIsoft and AVEVA



~1998

5.0 series Unix and converted to 6 series AVEVA SCADA

2007

Upgrade to Bragg Creek Edition of SCADA.
SimSuite Leak Detection
Operations Trainer Simulator

2012

Upgrade to OASys DNA Columbia Edition
64 Bit SimSuite (LDS)

2015-2017

Integrated MQTT with SCADA communications

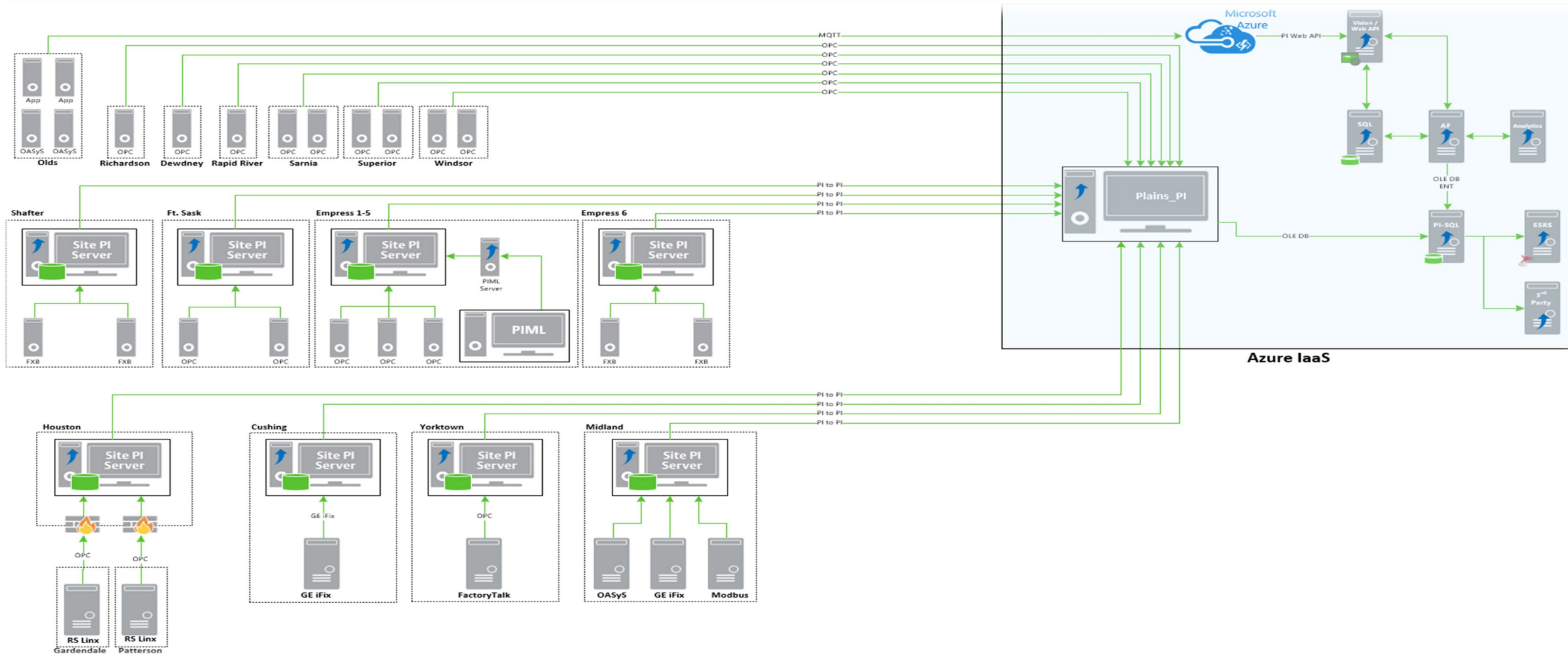
2017

Move from Legacy PI Infrastructure to Central PI



AVEVA

Overview of our PI Ecosystem



Plains AVEVA PI System Infrastructure

• PI System Infrastructure

- 17 Site PI Systems/Collectors and 1 Enterprise PI System (~350,000 tags)
- 50+ interfaces
- 250+ PI AF templates, 50,000+ elements
- All site data will be available in Enterprise PI System
- Full replica QA environment setup for system & QA testing

• Reporting:

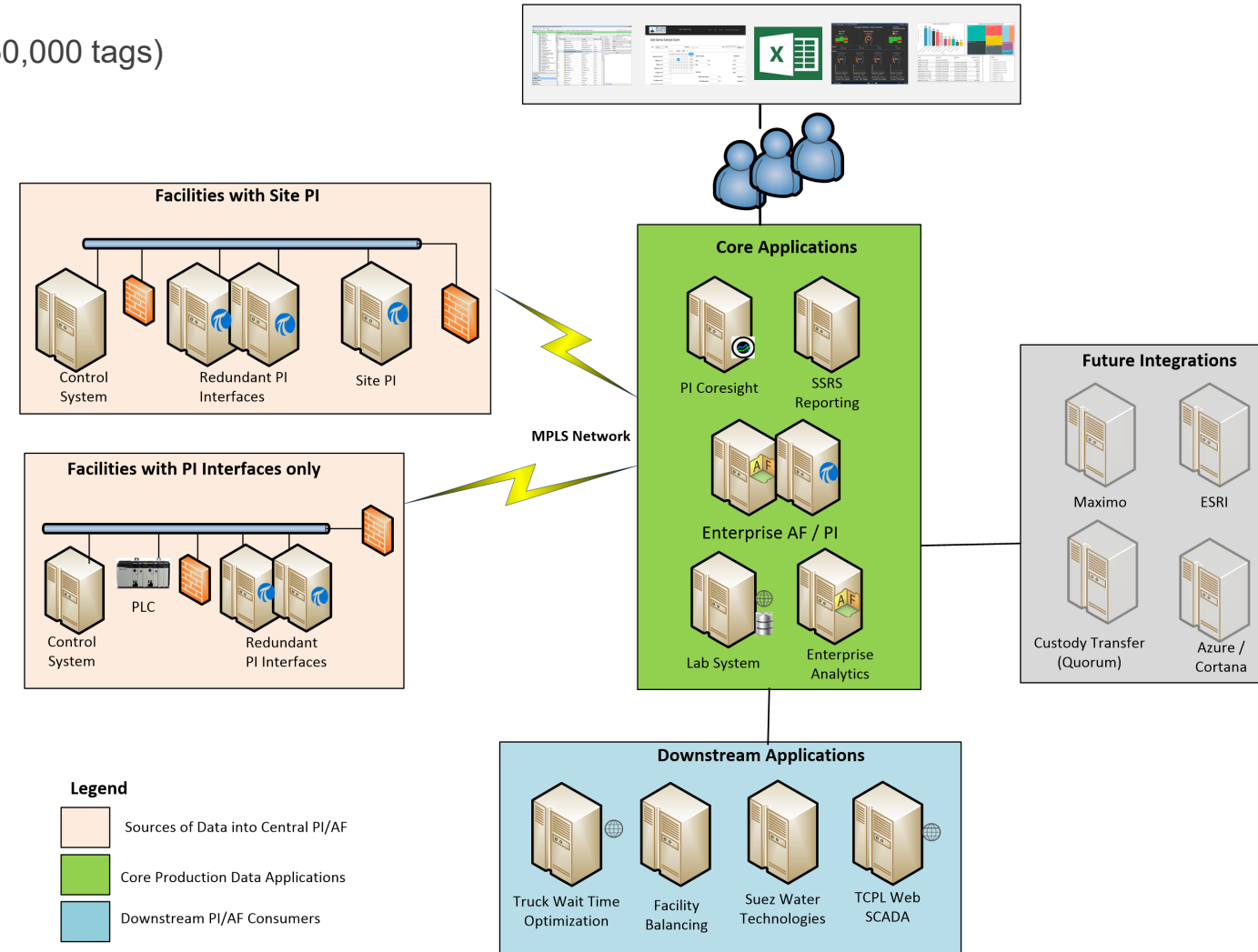
- Subset of operational data modeled in PI AF
- Centralized reporting from PI AF
- 200+ reports with raw / calculated data
- Lab data available via SSRS and PI AF

• Integrations:

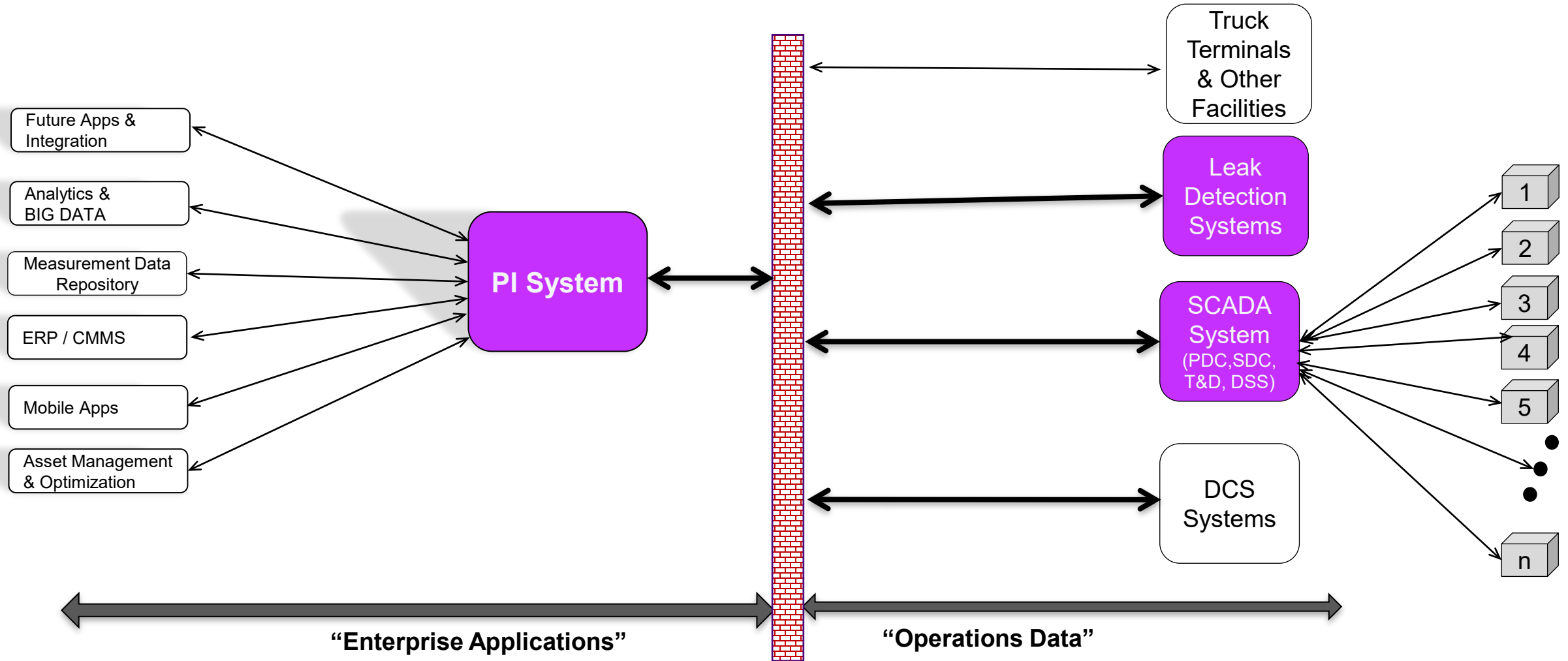
- Exports from Central PI System to Facility Balancing
- Information exchange mechanism with 3rd Parties
- Truck Wait Time Optimization (PI Web API)
- .Net applications using PI API and PI SDK
- MS Azure SQL DB with PowerBI reporting

• Notifications

- Leak Detection Engineers notified of any anomalies
- Technical Service Engineers notified of equipment anomalies



An Integrated Approach to OT Architectures



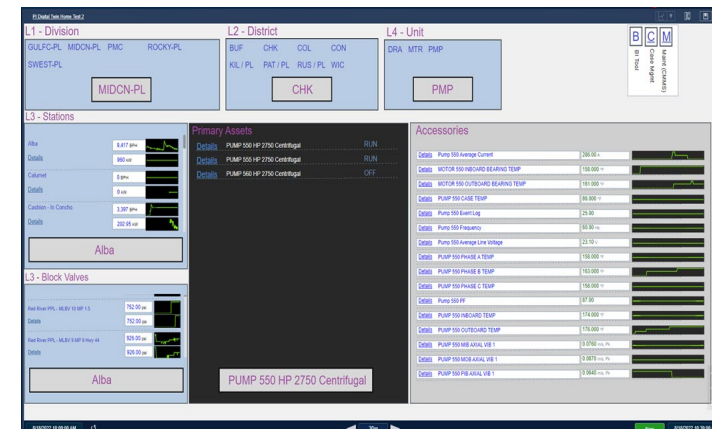
Enterprise Applications + Operations Data = Agile Enterprise



Use Cases

Empowering & Enabling Proactive and Intelligent Decision-Making Capabilities with the AVEVA Portfolio

“The use of the AVEVA portfolio including the PI System & Enterprise Pipeline Management Solution suite is transforming the way we work”



Challenge

- Diverse, tag and Excel based ecosystem from years of acquisitions and systems
- Reactive approach to asset performance management
- Inconsistency in approach to asset performance monitoring
- Improving asset reliability, efficiency, and safety

Solution

- Evolved the AVEVA PI System from a “historian” to an enterprise class ecosystem – a continuing journey
- Developed PI AF governance and a CoP with strong OT leadership
- “Started simple but simply started” development of PI AF/PI Vision templates for each asset class
- Integrated the PI System with the AVEVA Enterprise Pipeline Management Solution suite

Benefits

- Centralized, proactive, exception-based asset performance management
- Movement from a tag/excel to a centralized asset based ecosystem
- Increase in asset reliability, efficiency, and safety
- Increased synergy value with AVEVA portfolio.

Power of the PI System

PI AF

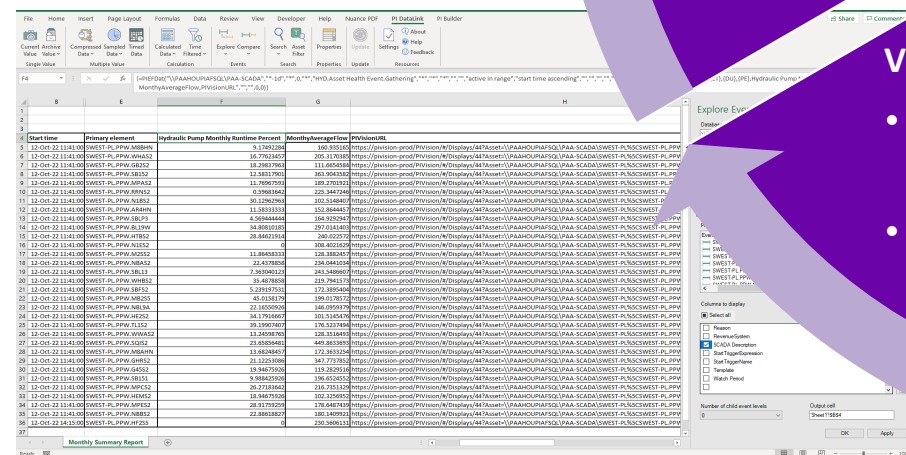
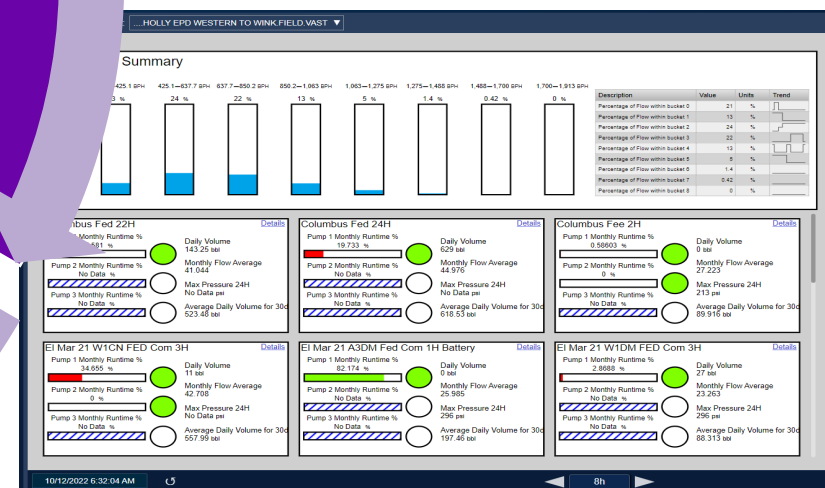
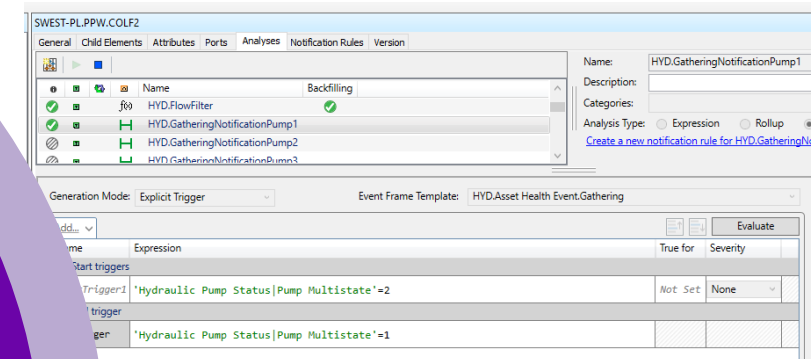
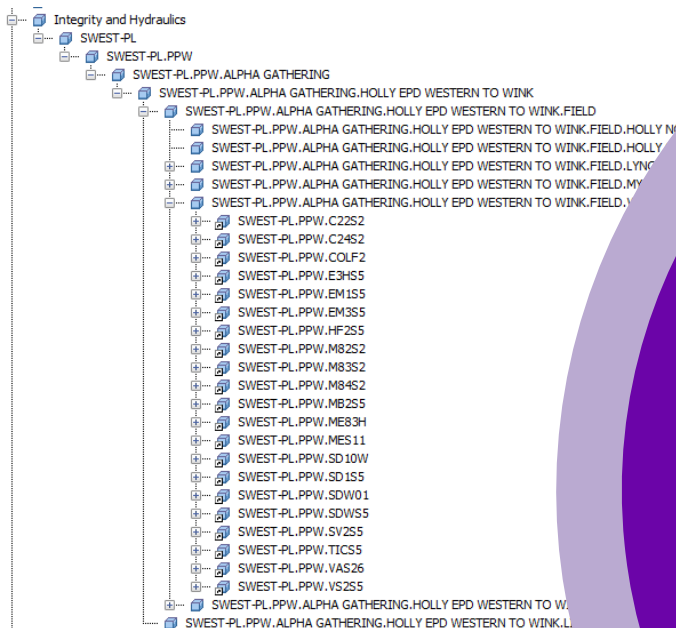
- Structured assets
- Facilitate and automate asset creation
- Standardize assets regardless of location
- Weak reference from Master Hierarchy to ensure data is maintained in one location

Event Frames

- Configured to automatically register significant drifts of performance, which will be further analyzed by SMEs

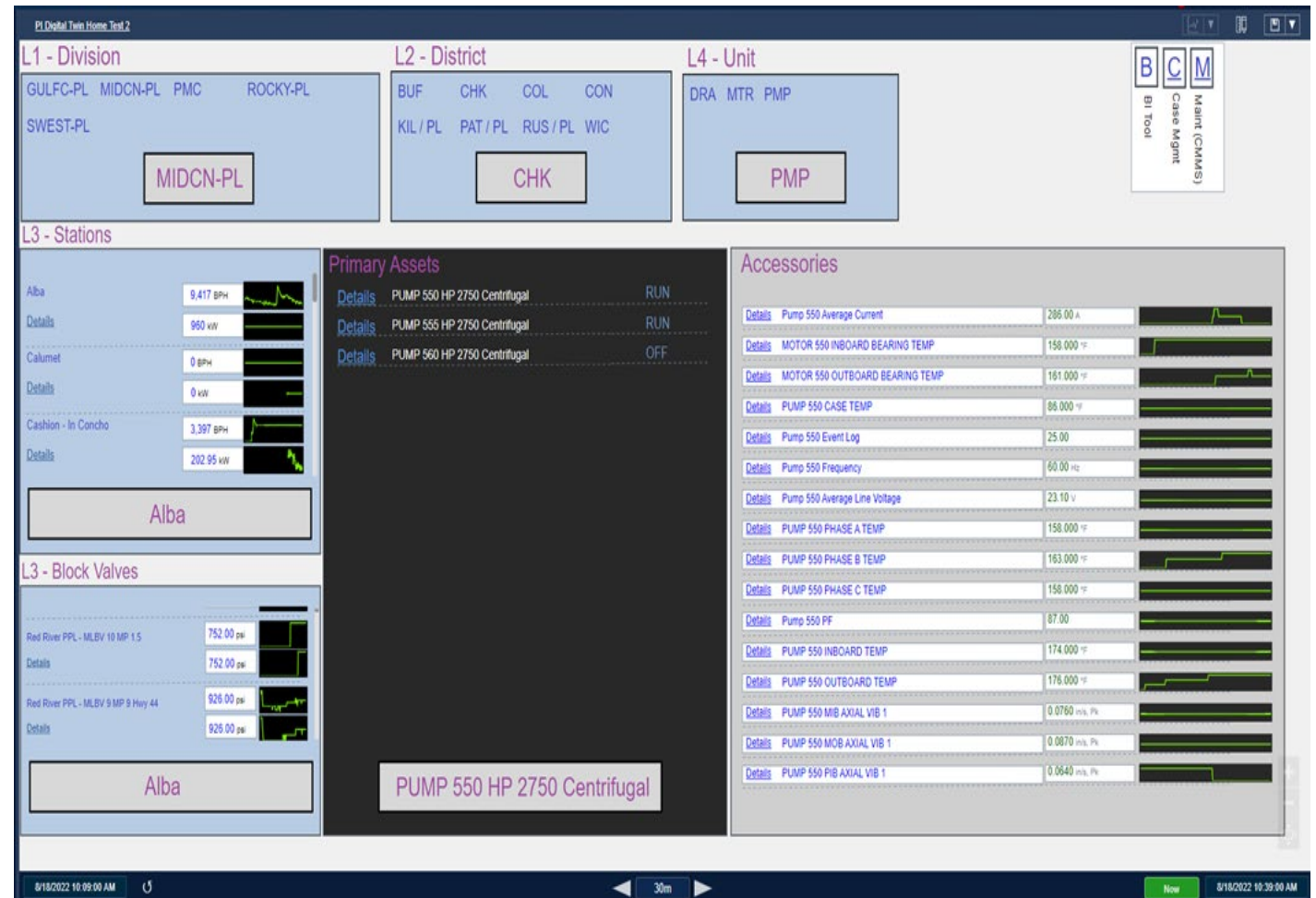
Visualization

- SMEs can quickly visualize and analyze assets through PI Vision and take action if needed
- Reports can be generated through PI Datalink to give monthly summaries of Event Frames



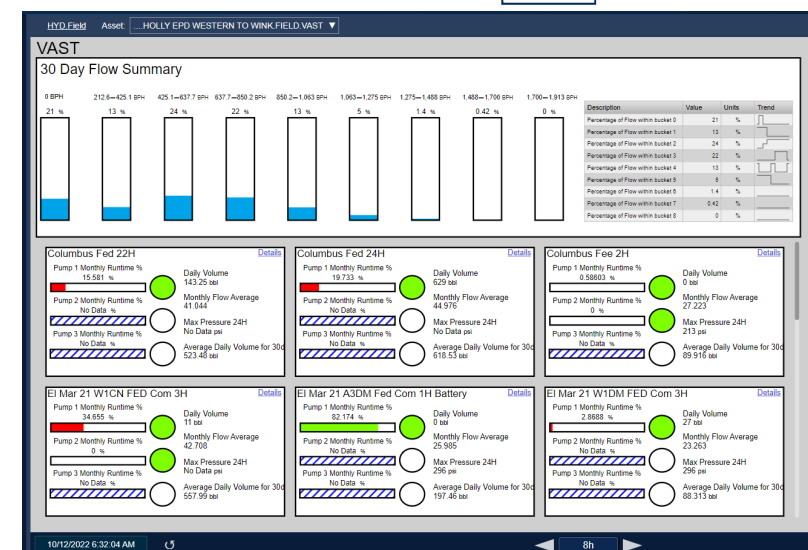
Global Displays for the Operational Twin

- Global displays with standard formats with home screens for ease of use managed by the PI CoP
- Each master template has its own unique collection display.
- The displays are linked to our CMMS locations for work process management.
- SMEs/individual users can develop their own PI Vision displays
- PI AF templates enable the use of PI Vision templates with asset relative ribbons and the use of collections



Intelligent Systems Optimization

“The use of the PI System and PI AF/PI Vision has significantly improved our ability to optimize our equipment performance.”



Challenge

- Difficulty in seeing the flow through the gathering networks for hydraulic analysis
- Inability to easily see pump historical and current status
- Inability to see and perform analytics on pumps that are underutilized or not at their best efficiency point(BEP)

Solution

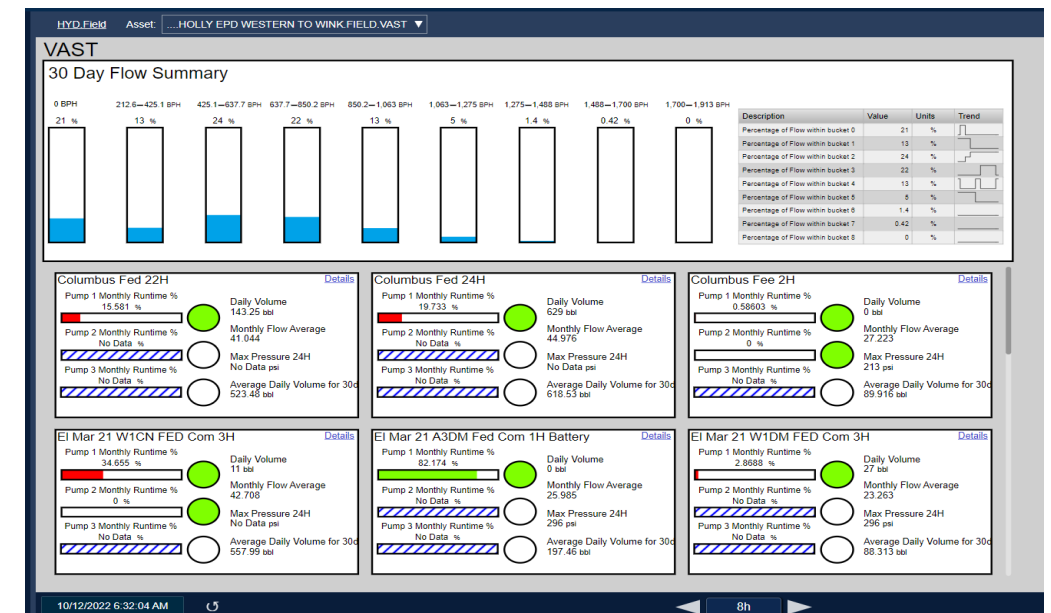
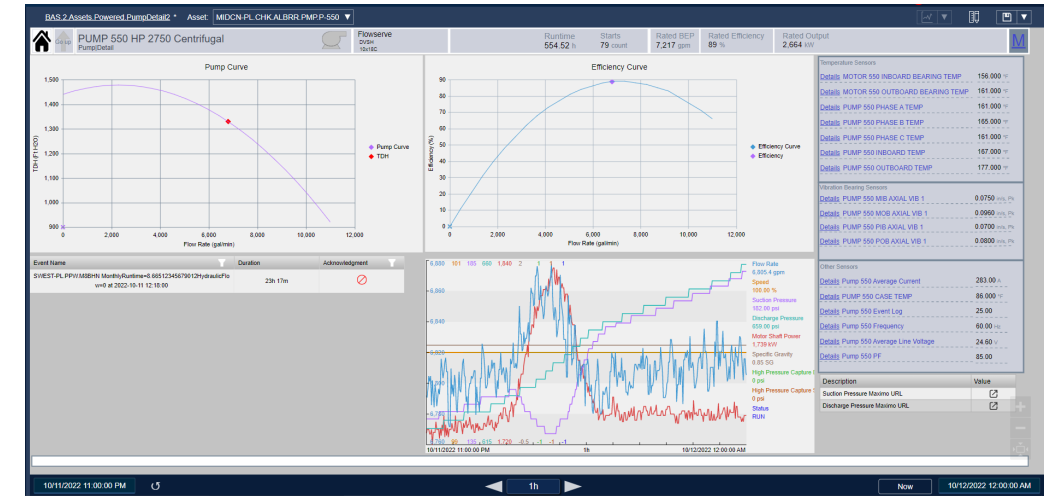
- Evolved the PI AF equipment templates to identify equipment utilization
- Set up event frames to alert stakeholders of any equipment anomalies
- Configured associated PI Vision “smart screens” to quickly visualize equipment data at-a-glance with proactive, exception-based capability

Benefits

- More accurate hydraulic analysis leading to significant OPEX and CAPEX savings
- Reduced energy usage
- Increased operational efficiency
- Enabled efficient remote support

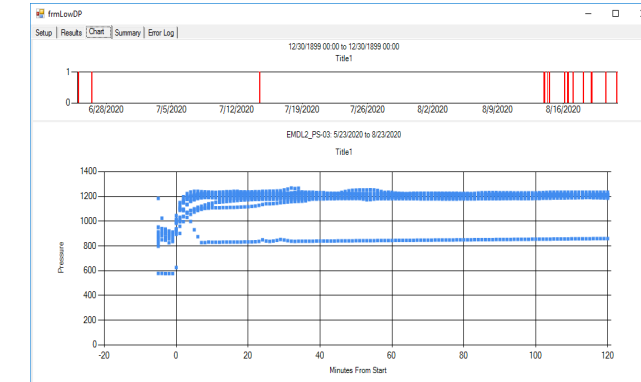
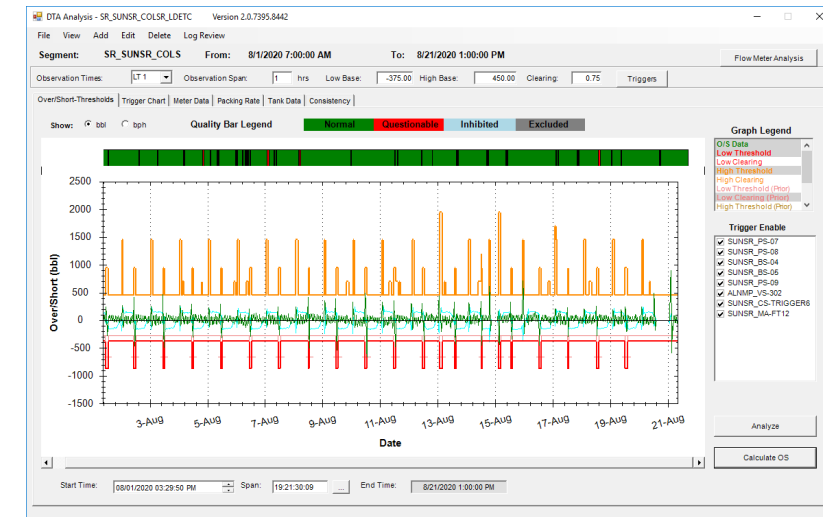
Intelligent Systems Optimization

- Streamlines the optimization process by providing real-time data and notifications for prompt action.
- Saves cumbersome, repeated manual analysis by various groups across the company.
- Forward planning and look ahead models can be developed for efficient use of resources.
- Transition to a proactive maintenance philosophy.

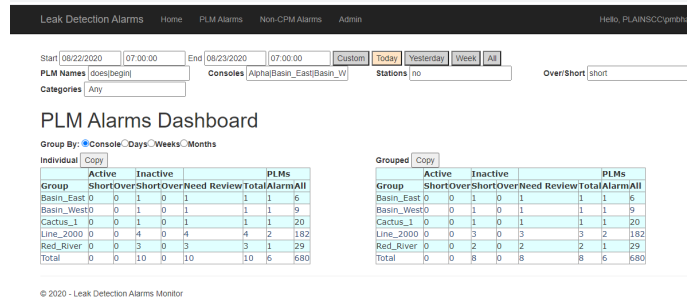


Leak Detection Advanced Data Analytics

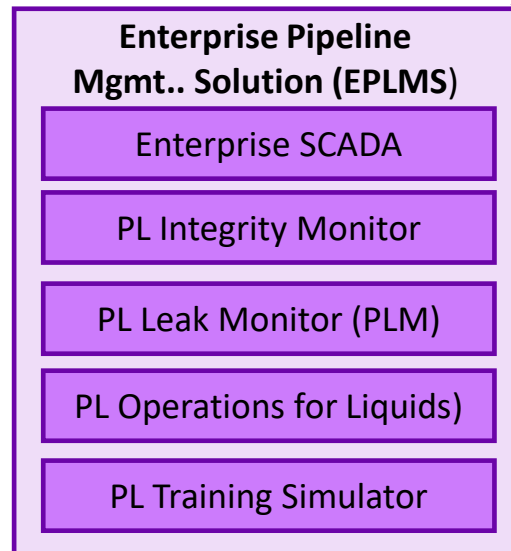
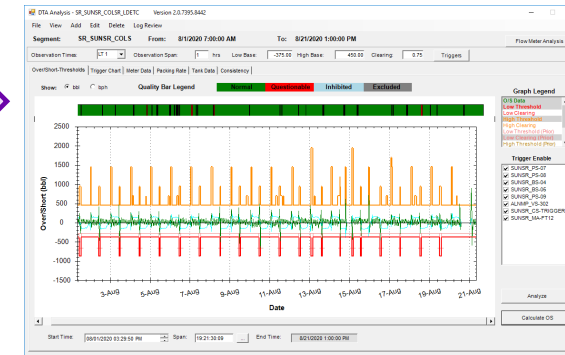
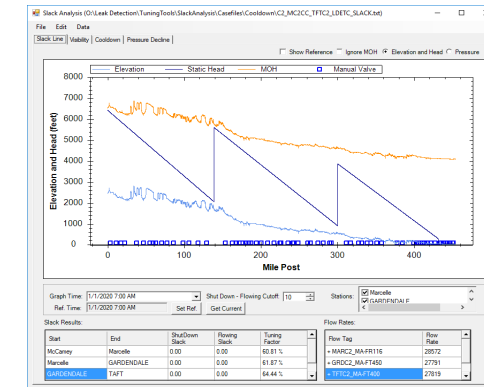
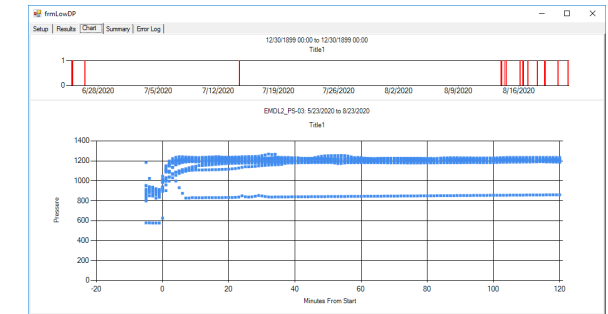
- Leak Detection Tools Suite was built using PI SDK and PI API utilizing data sent to PI from AVEVA SCADA and Leak Detection systems.
- The tools help optimize leak detection configuration, thresholds and integrity related shutdown setpoints.
- Helps improve current pipeline operations and suggest new pipeline operations before lines are operational.
- Makes use of operational data to give decisive answers on pipeline integrity shutdowns.
- Significant improvement in Plains Leak Detection KPIs of sensitivity, reliability, availability and robustness.



Capturing the Synergy Value of the AVEVA Portfolio to advance the Leak Detection Program

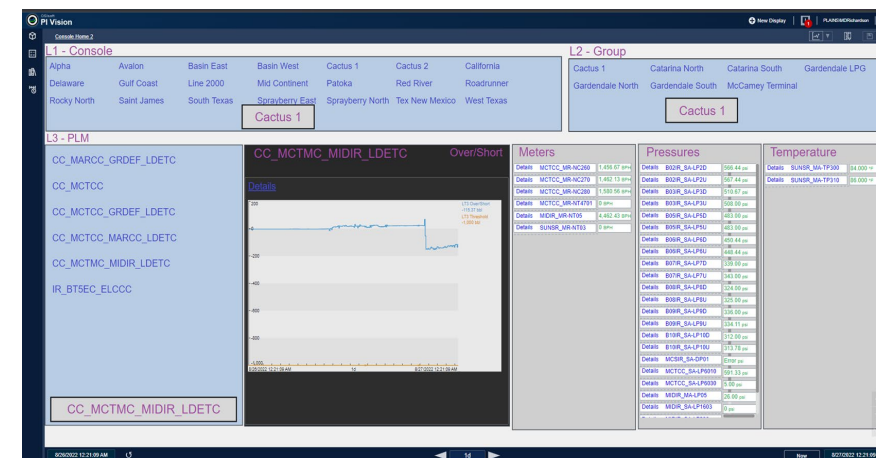


Leak Detection
Engineers



Proactive Leak Detection

“We have increased the effectiveness and efficiency of our leak detection with the integration between our AVEVA PI System and the AVEVA EPLMS.”



Challenge

- Reactive leak detection operations by the Leak Detection/Control Center
- No integration with the AVEVA Enterprise Pipeline Management Solutions – Integrity Monitor and Pipeline Operations for Liquids modules

Solution

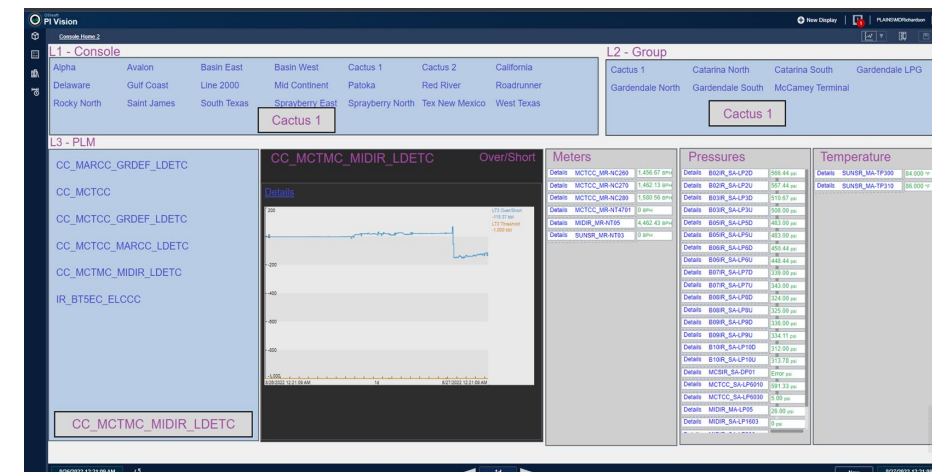
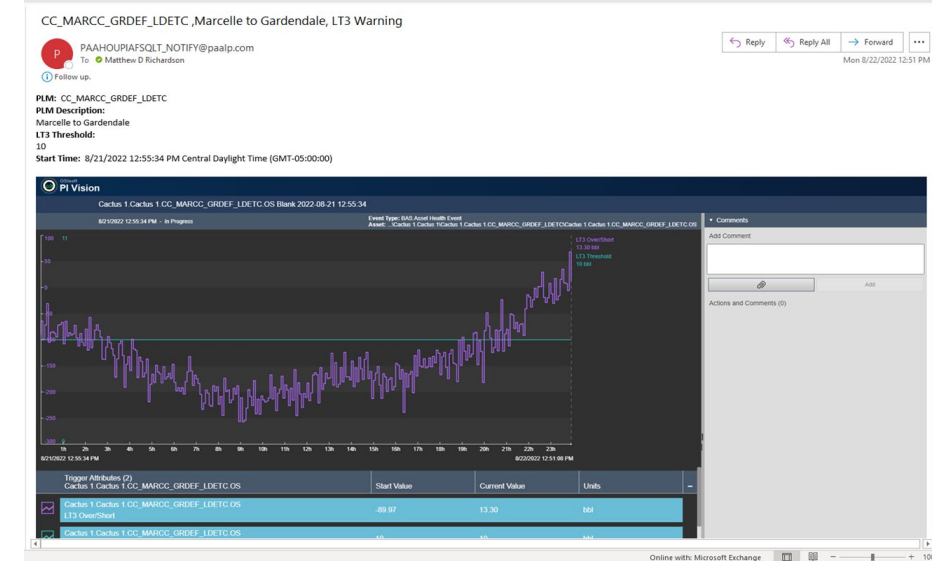
- Increased the integrated between the PI System/PI AF and AVEVA EPLMS
- Configured PI AF, PI EF & PI Notifications to identify and notify Leak Detection engineers & console managers.
- Developed PI Vision smart screens & PI Notifications to enable quick visualization of associated operational information

Benefits

- Minimize integrity related line shutdowns
- Proactive approach to identify issues before a critical alarm
- Easy access to troubleshoot trends and associated data
- Captured synergy value between the AVEVA PI System and AVEVA EPLMS

Early Insights and Fast Decision Making

- Utilizes the asset framework for quick analysis of various leak detection trends.
- Early warning notifications to stakeholder if the over/short trend goes negative.
- Allows for easy diagnosis of instrument hiccups that can potentially cause a false alarm.
- Linked with the Plains Maximo (CMMS) system for troubleshooting and repair.



Thoughts on Best Practices and Lessons Learned

Best Practices

1. Establish a PI System CoP with strong OT Management Oversight
2. Redefine the IT/OT Partnership
3. Define an organizational PI System awareness/competency matrix and provide a portfolio of training/coaching
4. Identify and capture synergy value between the AVEVA portfolio & the PI System
5. Develop an analytics strategy and use a “layers of analytics” approach with PI AF as the streaming analytics foundation

Lessons learned

1. Issues with IT owning/leading the PI System implementation...there is a role for traditional IT support...but OT needs to “own” the PI System
2. Do not try and “boil the ocean” with the PI System rollout
3. Look for “leaders” vs “to everybody” to help define and support the rollout
4. Establish executive sponsorship and leverage with an oversight responsibility
5. Start ‘small’ but think ‘big’.

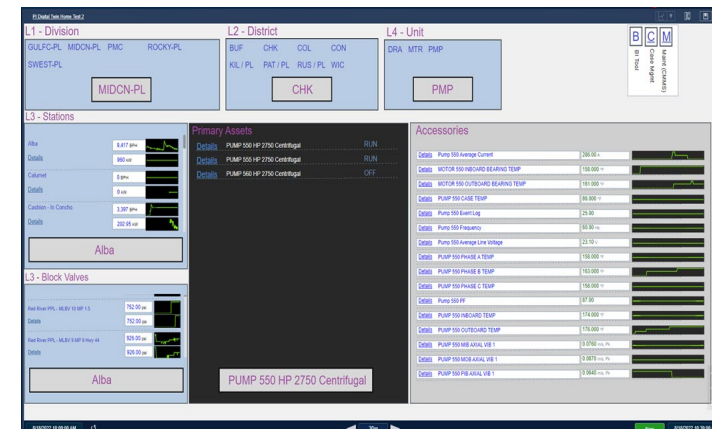
Continuing our Journey.....

- Continue to raise the level of organizational awareness and capabilities of the AVEVA PI System/PI AF
- Continue to identify additional use cases, support self-serve development, evolution, and sustainment
- Continue to leverage the AVEVA PI System as an integration, applications, and analytics infrastructure with integration with other operational and business intelligence systems
- Realize additional synergy values from AVEVA suite of products including Enterprise SCADA, Leak Detection, Polaris and PI.

“Do we want a slightly better yesterday
or a brand-new tomorrow?”

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Speakers



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Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!