
AVEVAWORLD

PLAINS

Taking Pipeline Intelligence to the Next Level

April 2025

Who We Are & What We Do

Plains Team

4,000 +

Employees across US and Canada

Transportation

~18,800 Miles	9,000 Mbbl/d	~3,400
Crude Oil Pipelines	Crude Oil Pipeline Vol	Trucks & Trailers
~1,800 Miles	~200 Mbbl/d	4,300
NGL Pipelines	NGL Pipeline Vol	Railcars

Storage

~110 Mbbls	~20 Mbbls
Crude Oil Storage	NGL Storage

Fractionation / Processing

~6 BCF	~170 Mbbl/d	4
Gas Processing Capability	NGL C3+ Fractionation Capacity	Gas Staddle Plants

**Numbers current as of Dec. 31, 2024*

From Customer to Strategic Partner

PLAINS ALL AMERICAN PIPELINE, L.P.

1998-2007
5.0 series Unix and converted to 6 series SCADA

2009
Upgrade to Bragg Creek Edition of SCADA. SumSuite 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

2021
Upgrade to DNA 2018 complete. PAA Shares LD Tools with AVEVA Elite Customer Agreement with AVEVA

2023
North American PI system. North American Leak Detection Systems

2025
Upgrade to Enterprise SCADA 2025

Combined Enterprise SCADA 2025

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2026
Upgrade to Enterprise SCADA 2025

2024
Upgrade to Enterprise SCADA 2023

2021
Upgrade to Enterprise SCADA 2021 Pipeline Integrity Monitor 2.0

2017
Move Legacy PI Infrastructure to Central PI

2015-2017
Integrated MQTT with SCADA communications

2012
Upgrade to OASys DNA Columbia Edition 64 Bit SimSuite (LDS)

2007
Upgrade to Bragg Creek Edition of SCADA. SimSuite Leak Detection Operations Trainer Simulator

PLAINS MIDSTREAM CANADA

~1998
5.0 series Unix and converted to 6 series AVEVA SCADA

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

About Streamline Control

streamlinecontrol

Formed in 2011 - Offices in Calgary and Edmonton
50 Personnel - 46 Employees / 4 Contractors

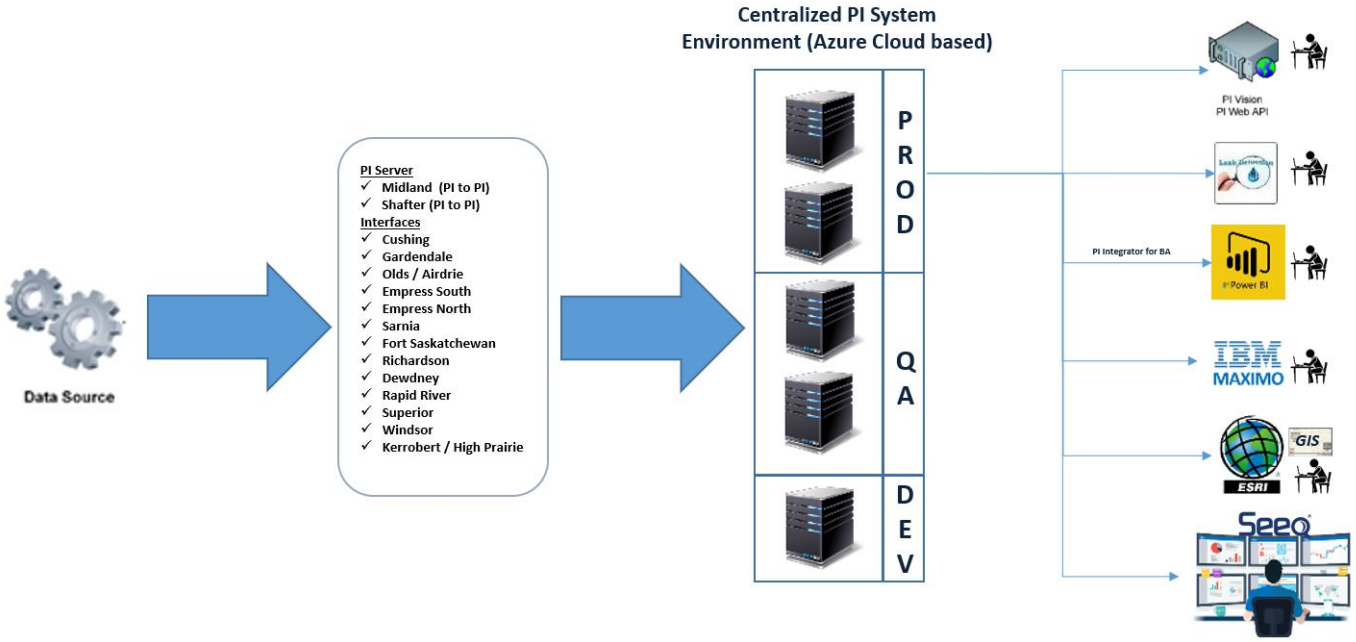
- **Historians & Business Intelligence**
  - OT / IT Convergence
  - AVEVA PI / Power BI etc.
  - AVEVA Connect
- **AVEVA Enterprise SCADA**
  - Large Pipeline Systems / CRM
- **IIoT & Middleware**
  - Realtime Data Acquisition / Scalable Architectures / Future-Proofing
  - Manufacturing / Mobile Business Systems / Big Data
- **Analytics & Machine Learning**
  - Data Pipelines / Data Analytics / ML
- **Communications & Cybersecurity**
  - Physical Infrastructure / LANs / WANs / Radio / Microwave etc.
  - PURDUE Architectures / Industrial Networks
- **Support**
  - SLAs / Enhancements

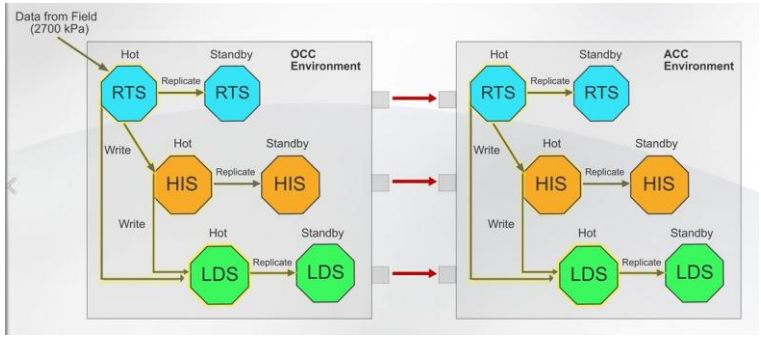
CHS · Alliance Pipeline · PLAINS · CERTARUS · PEMBINA · GIBSON ENERGY · XTO ENERGY · ENBRIDGE · BOARDWALK PIPELINES · encana · TC Energy · PHILLIPS 66

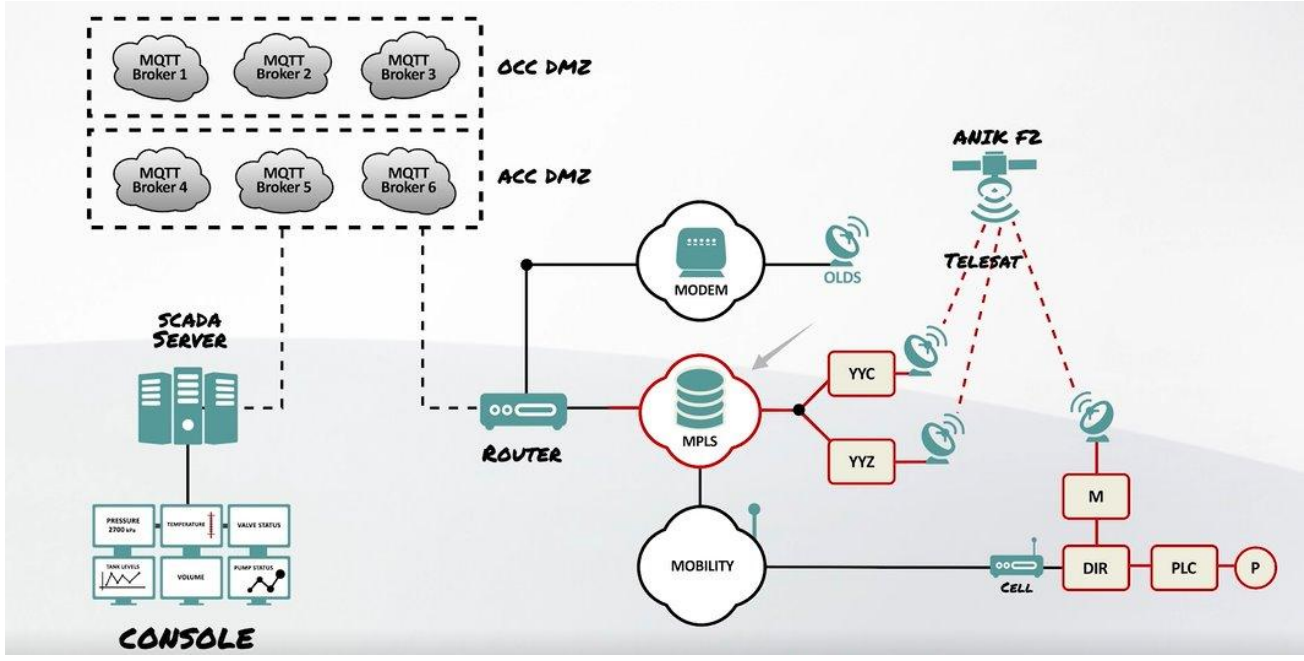
AVEVA CERTIFIED OPERATIONS System Integrator

What Have We Been Up To?

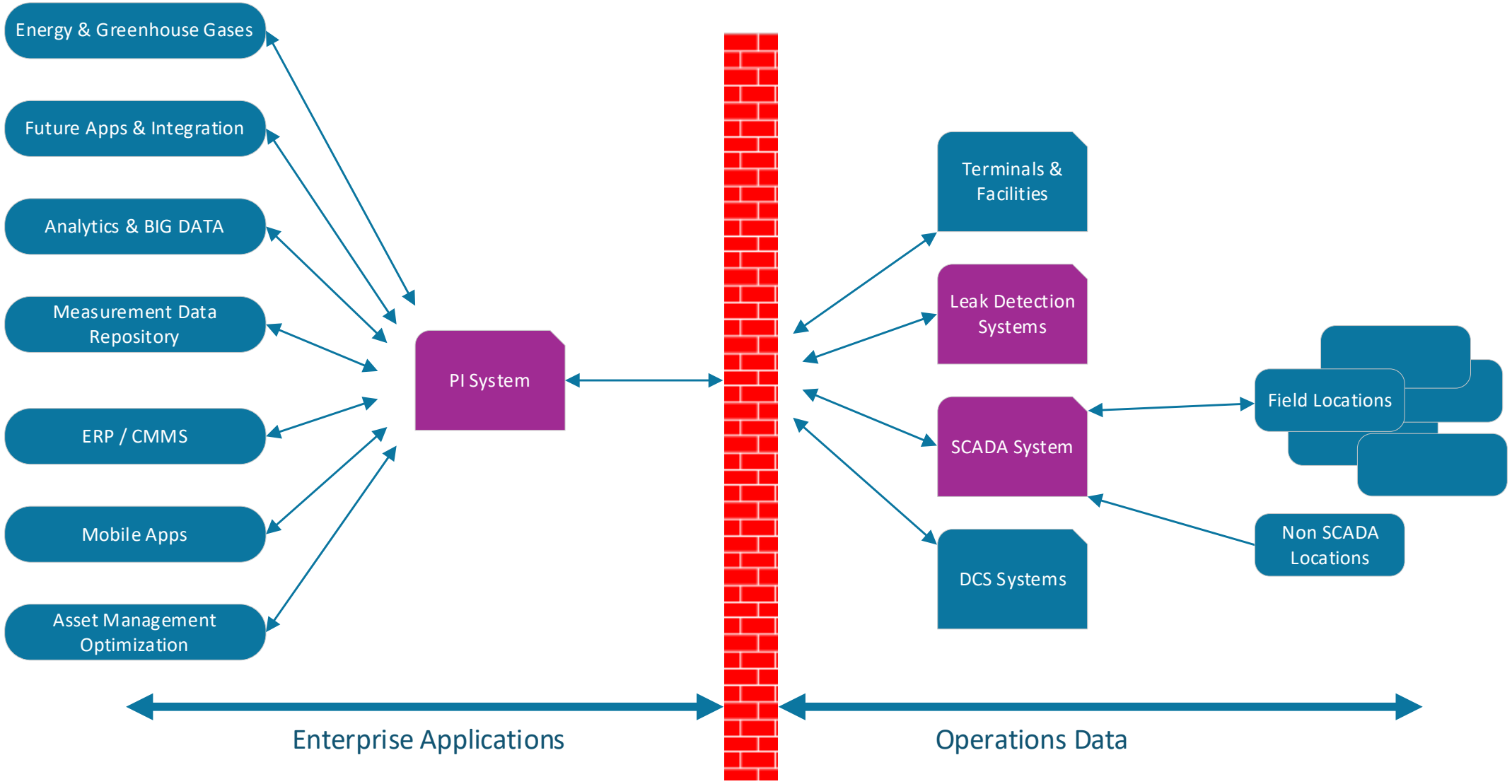
- Centralized our AVEVA PI System architecture in the cloud
  - Production, QA and DEV Environments
  - High Availability
  - Load Balancing
  - Microsoft Azure virtual environment
  - PI ProcessBook to PI Vision migration
- Upgraded our AVEVA Enterprise SCADA system in Olds to Enterprise SCADA 2023
  - Currently in the process of upgrading our SCADA systems in Midland
- Converged our Leak Detection Program in the US and Canada
  - Hybrid 'PLM' & 'SimSuite/PIM' systems
  - Rolled out System and Program level KPIs







Integrated Approach to OT Architectures



Enterprise Applications + Operations Data = Agile Environment

PI Central Architecture

PI System Infrastructure

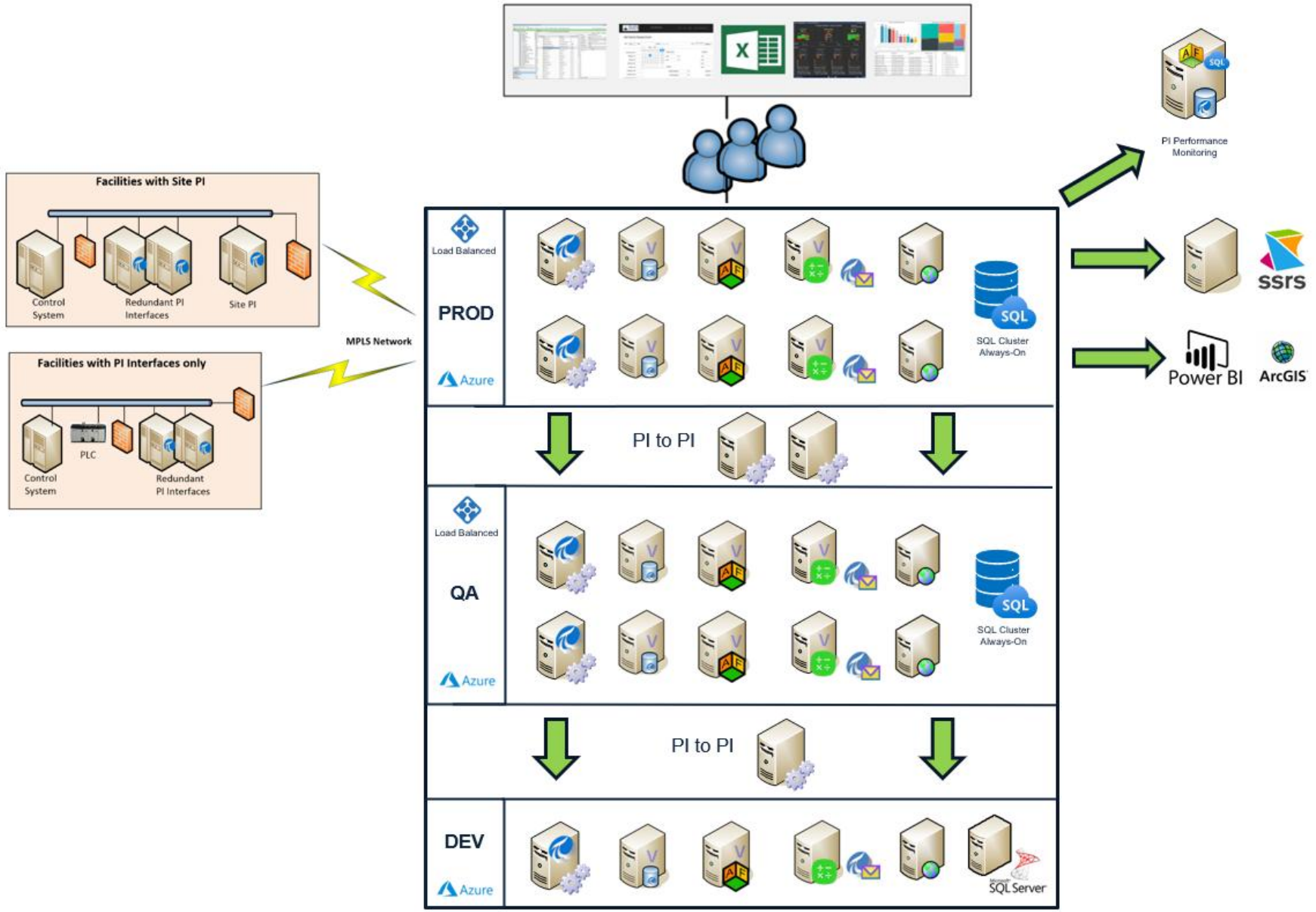
- 29 interfaces (New Nutanix hardware)
- 30 servers
- Approx ~284,000 tags
- 300+ PI AF templates, 60,000+ elements
- All site data available in Enterprise PI System
- Standardizing the PI System (data governance)
- Full replica QA environment for system & QA testing

Reporting

- SSRS Production Reports
- Majority of operational data modeled in PI AF
- Centralized reporting from PI AF
- 200+ reports with raw / calculated data
- Exports from Central PI System to Facility Balancing
- Information exchange mechanism with 3rd parties
- Net applications using PI Web API and PI AF SDK
- PI Integrator for Business Analytics (Power BI)

Notifications

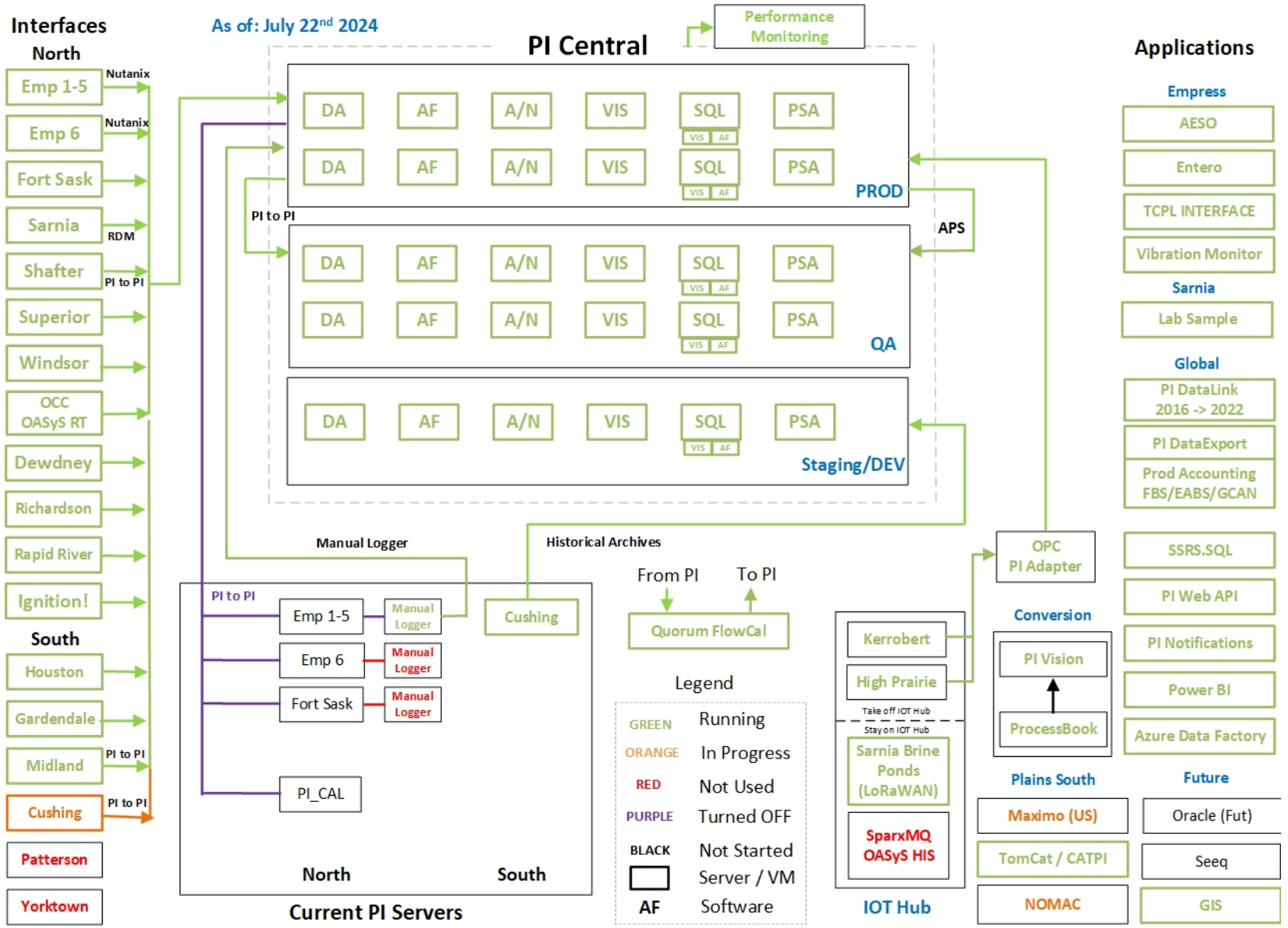
- Leak Detection Engineers notified of anomalies
- Technical Service Engineers notified of equipment anomalies



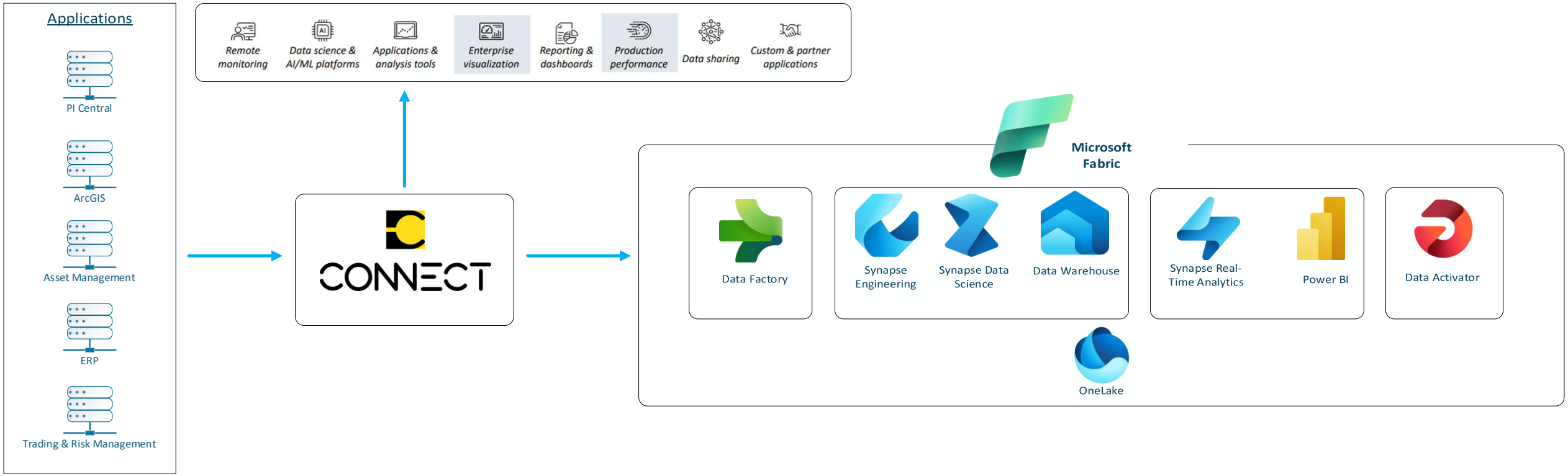
AVEVA PI System Integrations

Integrated Applications

- Production Accounting (NOMAC)
- Plant Balancing (PI Data Export)
- Measurement Software (FlowCal and Entero One)
- Azure Data Factory
- Vibration Monitoring Brüel & Kjær Vibro
- IIoT Edge Devices
- Data exchange between pipeline companies
- SCADA Systems - AVEVA Enterprise SCADA
- Sampling and Analysis
- Pipeline Leak Detection (PI AF SDK application)
- Power BI reporting
- Esri ArcGIS
- Mobile Applications (PI Manual Logger)



Future Unified Data Platform (CONNECT & Microsoft Fabric)



- Unified data platform – One location to access operational, commercial and corporate data
- Enterprise visualization – A unified view of operational data
- Provide operational data across the organization without providing wide-spread access to the OT environment
- AVEVA PI System data integration with Microsoft Fabric using native connector for CONNECT

How are we leveraging all of this?

Maximize Return on Investment

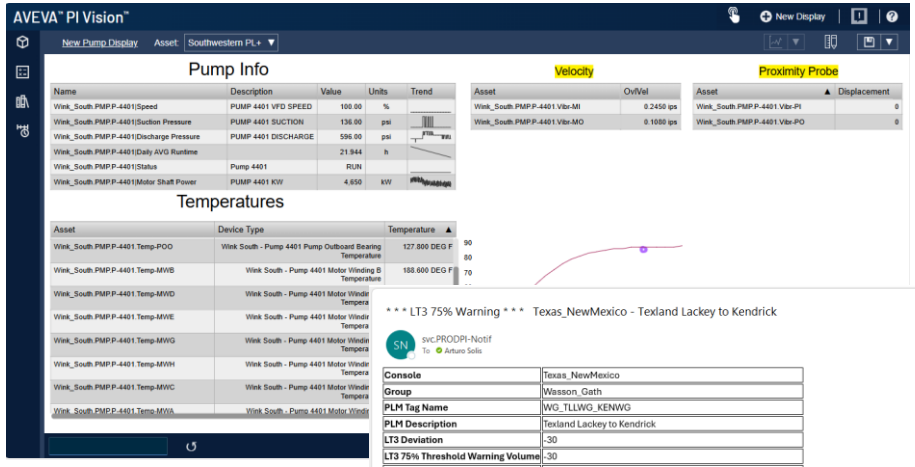
Industrial Data Management Strategy

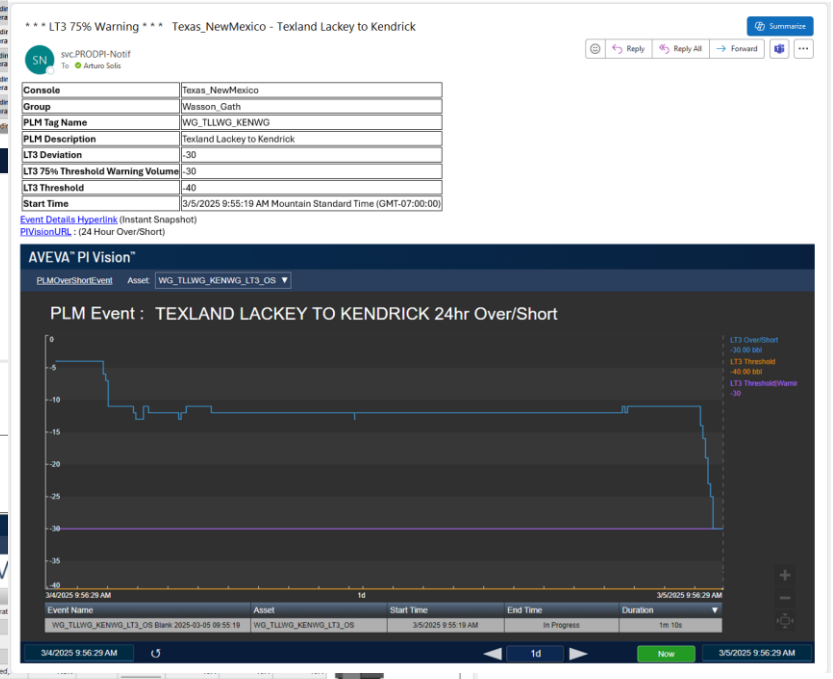
Hierarchical Structure

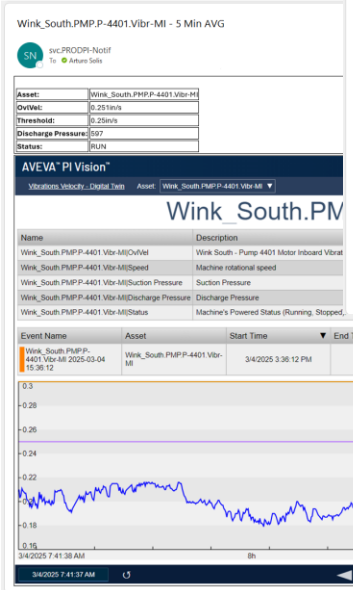
Align Analytics to Hierarchy

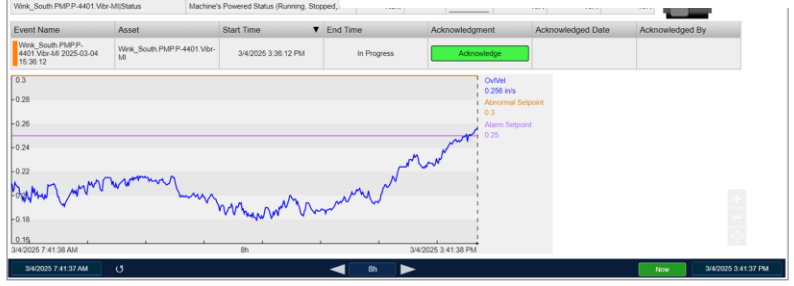
Templatized Elements, Analyses and Event Frames

Improved Decision Making with Notifications and Dashboards

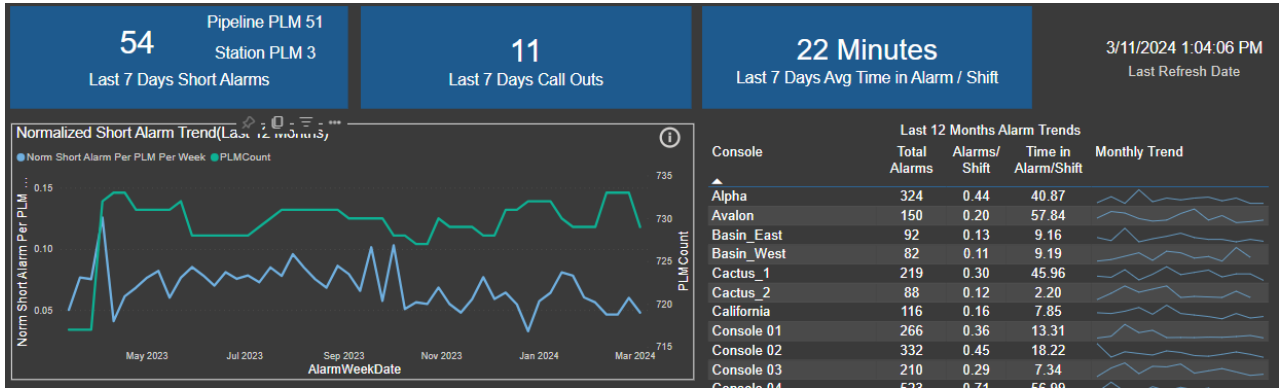


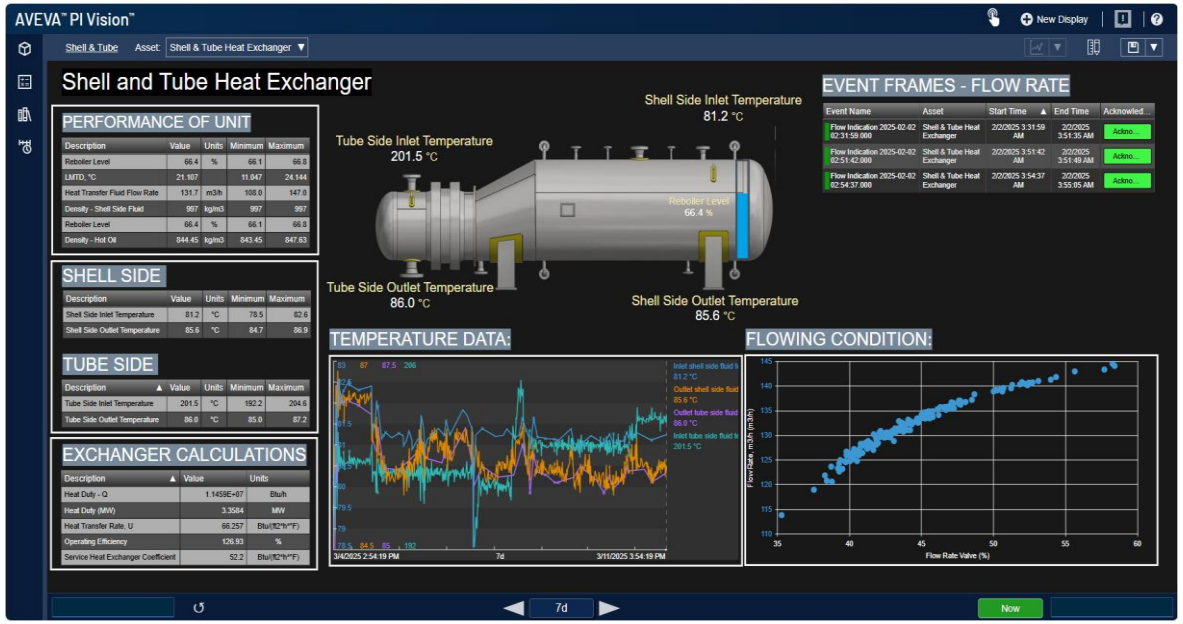






- Leak Detection dashboards utilizing information from PIM/PLM and SCADA for continuous improvements
- PI Notifications using Event Frames in Asset Framework to indicate potential equipment issues
- Executive Power BI Dashboards that blend PI data with other sources for high level view of business processes

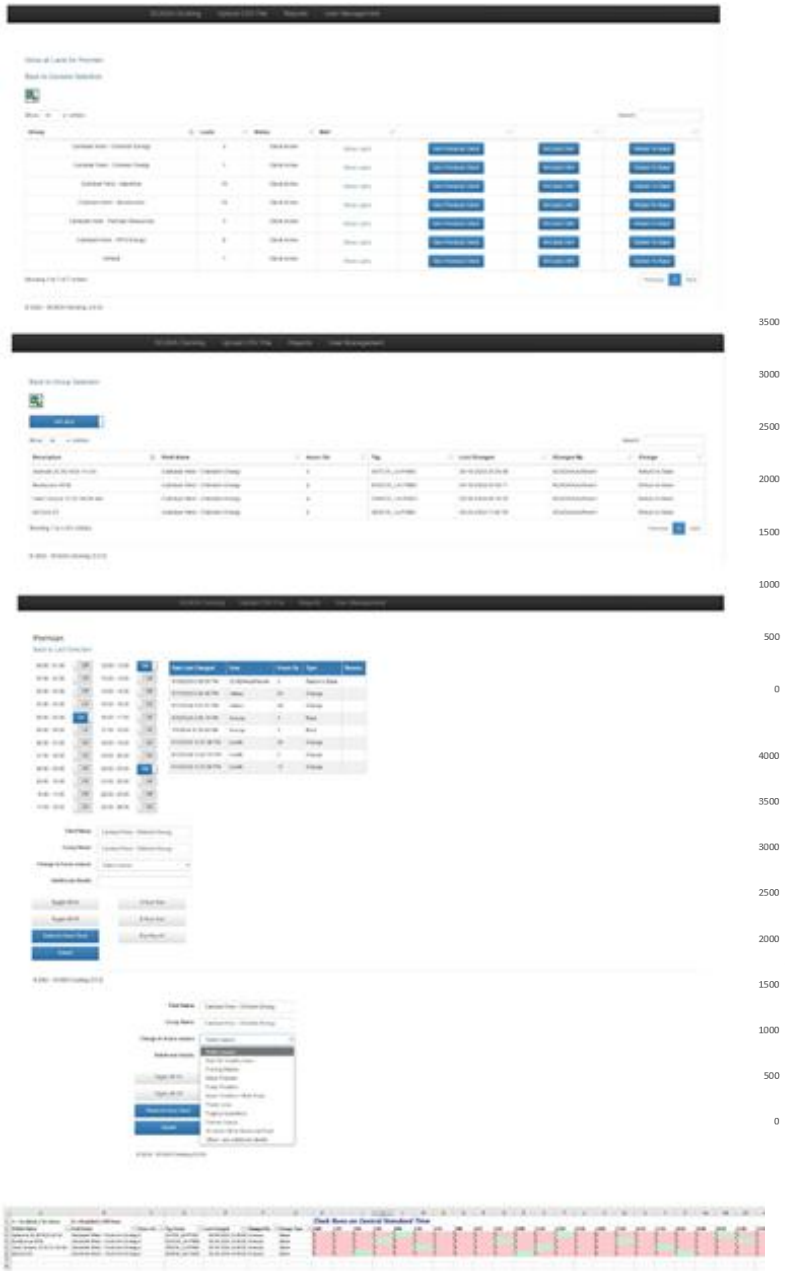


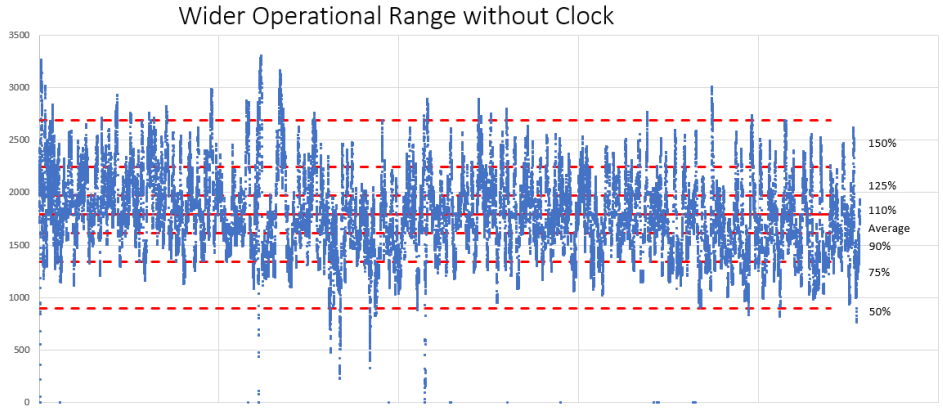


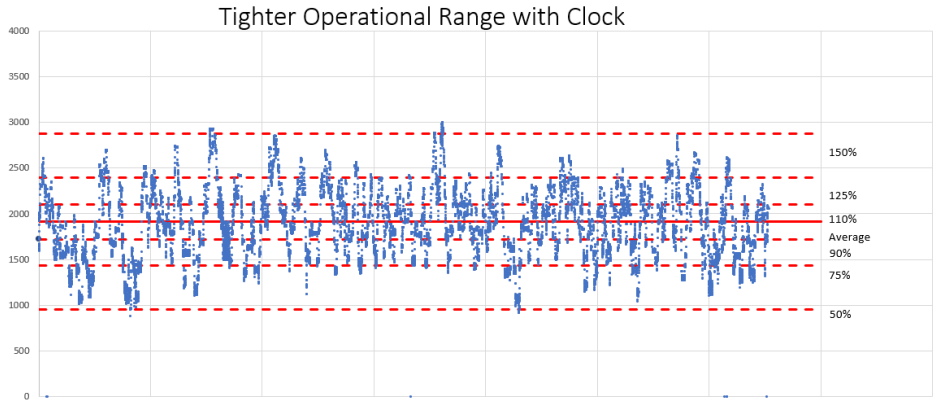
Real Time Intelligent Systems Optimization

- Eliminate cumbersome and repeated manual analysis by various groups across the company
- Streamline the optimization process by providing real-time data and Event Frame driven notifications
- Transition to a proactive maintenance philosophy
- Forward planning and look ahead models have been developed – providing efficient use of resources

Use Simulation, SCADA and AVEVA PI System to Make Pipelines Safer and Efficient

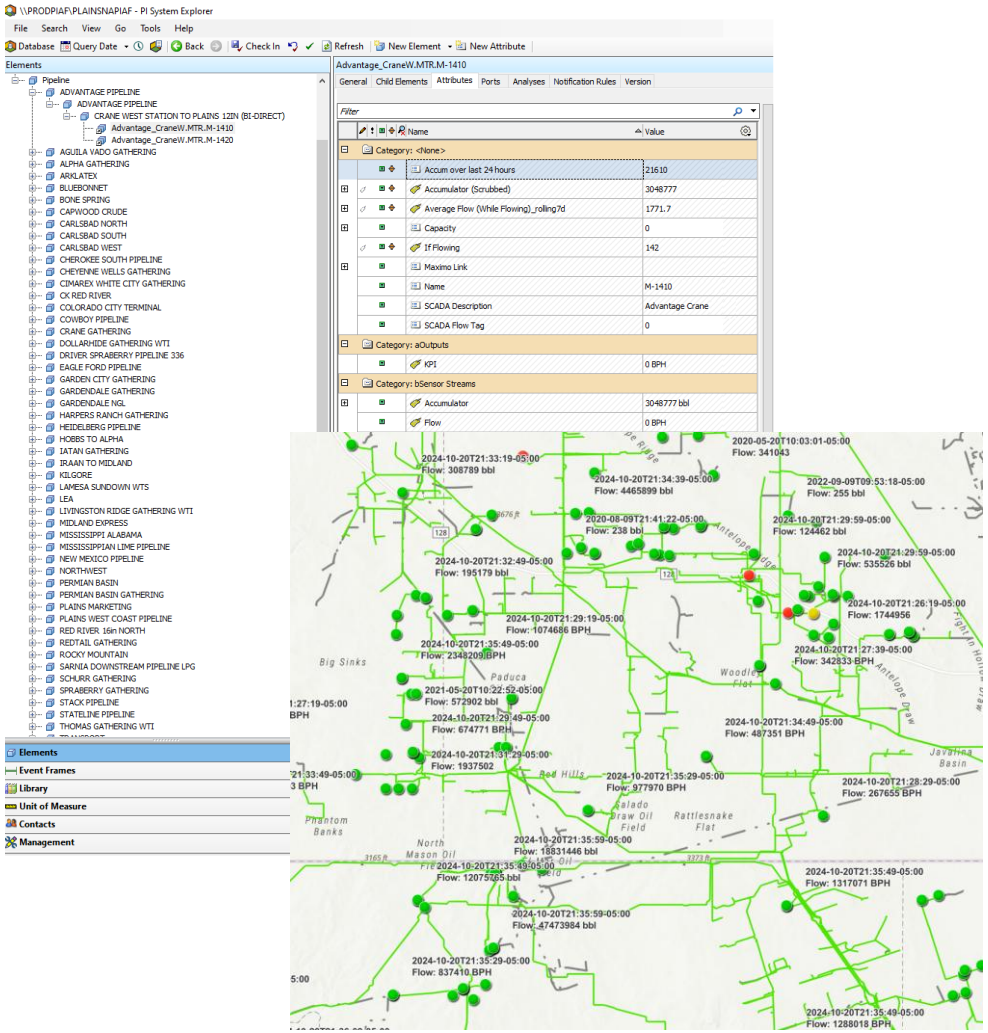






Leveraging AVEVA SCADA and PI, LACT sites are clocked

- Considerable capital savings
  - 2024 savings > USD 5MM
- Efficiency & cost impact
  - Reduced Power consumption
  - Reduced DRA use
- Reduced downtime & call-outs
- Improved leak detection
- Consistent flow and Improved measurement
- Commercial confidence

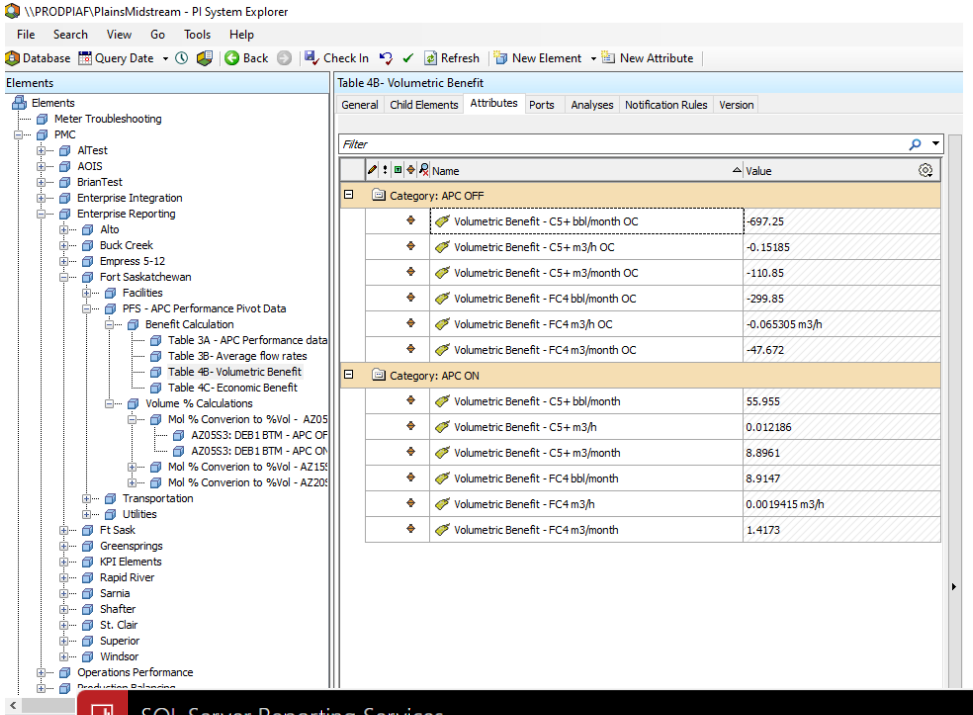


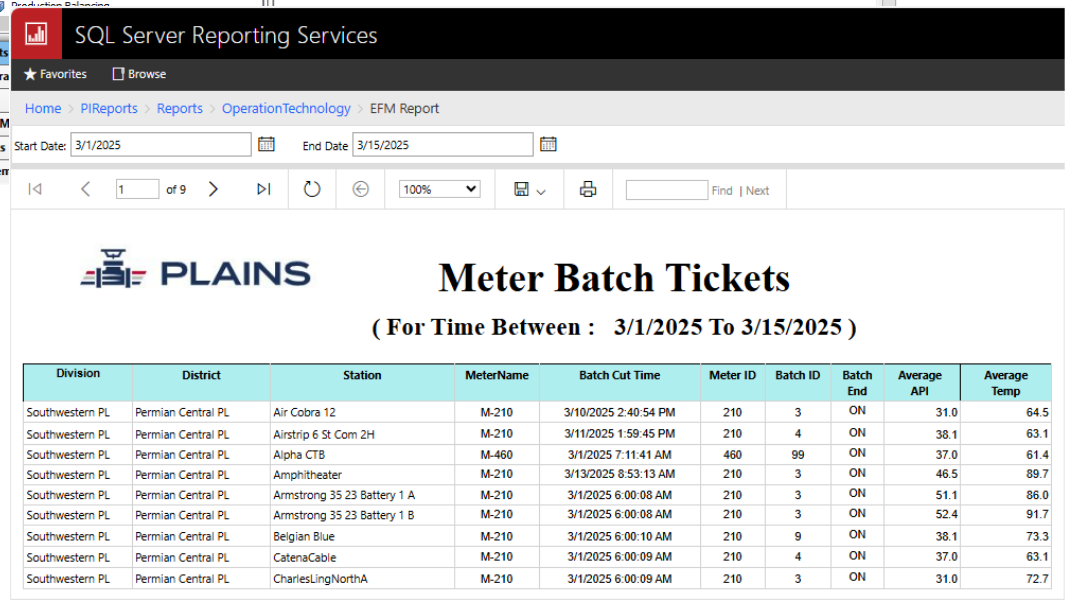
Enterprise GIS system with PI Data

- Integration of Enterprise GIS with PI Data
- Use ESRI's ArcGIS system, AVEVA's SCADA and PI Asset Framework to identify pipeline segments with Low Flow/Now Flow conditions
  - Generate heat maps based on duration using AF Calculations
  - Overlay with Product quality maps to determine frequency of chemical injections
  - Route optimizations and efficient work planning
- Integration of PI Web API with Safe Software Feature Manipulation Engine (FME) to expose PI calculations on Web based maps and ESRI's field Map application
  - Real Time information at your fingertips

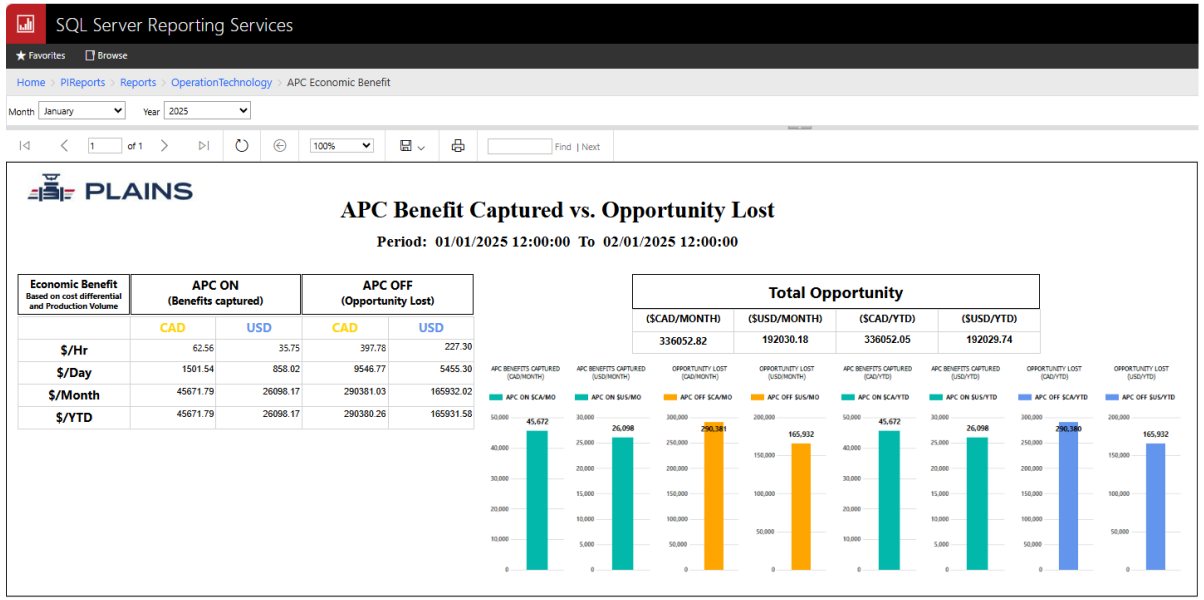
SSRS Distributing PI Data

- Tailor content to team receiving report
- Considerable time savings





Division	District	Station	MeterName	Batch Cut Time	Meter ID	Batch ID	Batch End	Average API	Average Temp
Southwestern PL	Permian Central PL	Air Cobra 12	M-210	3/10/2025 2:40:54 PM	210	3	ON	31.0	64.5
Southwestern PL	Permian Central PL	Airstrip 6 St Com 2H	M-210	3/11/2025 1:59:45 PM	210	4	ON	38.1	63.1
Southwestern PL	Permian Central PL	Alpha CTB	M-460	3/1/2025 7:11:41 AM	460	99	ON	37.0	61.4
Southwestern PL	Permian Central PL	Amphitheater	M-210	3/13/2025 8:53:13 AM	210	3	ON	46.5	89.7
Southwestern PL	Permian Central PL	Armstrong 35 23 Battery 1 A	M-210	3/1/2025 6:00:08 AM	210	3	ON	51.1	86.0
Southwestern PL	Permian Central PL	Armstrong 35 23 Battery 1 B	M-210	3/1/2025 6:00:08 AM	210	3	ON	52.4	91.7
Southwestern PL	Permian Central PL	Belgian Blue	M-210	3/1/2025 6:00:10 AM	210	9	ON	38.1	73.3
Southwestern PL	Permian Central PL	CatenaCable	M-210	3/1/2025 6:00:09 AM	210	4	ON	37.0	63.1
Southwestern PL	Permian Central PL	CharlesLingNorthA	M-210	3/1/2025 6:00:09 AM	210	3	ON	31.0	72.7



Economic Benefit (Based on cost differential and Production Volume)	APC ON (Benefits captured)		APC OFF (Opportunity Lost)	
	CAD	USD	CAD	USD
$/Hr	62.56	35.75	397.78	227.30
$/Day	1501.54	858.02	9546.77	5455.30
$/Month	45671.79	26098.17	290381.03	165932.02
$/YTD	45671.79	26098.17	290380.26	165931.58

Total Opportunity			
($CAD/MONTH)	($USD/MONTH)	($CAD/YTD)	($USD/YTD)
336052.82	192030.18	336052.05	192029.74

Best Practices and Lessons Learned

Best Practices

- Establish Source Systems with strong OT Management oversight
- Clarify the IT & OT partnership
- Define an organizational Source System awareness/competency matrix and provide a portfolio of training
- Identify and capture synergy value with the AVEVA portfolio & AVEVA PI System
- Develop an analytics strategy and use a las of analytics approach with PI AF as the streaming analytics foundation

Lessons Learned

- There is a role for traditional IT support but, OT needs to own the Source System
- Do not try to “boil the ocean” upon rollout
- Look for leaders opposed to everybody to help define and support rollout
- Establish executive sponsorship and leverage with an oversight responsibility
- Start small… Think Big!

Continuing our Journey

- Establish a data governance plan
  - Define quality standards, ownership, policies, procedures and access control
- Continue to raise the level of organizational awareness and capabilities. Integrate various source systems with added focus on AVEVA capabilities
- Continue to identify additional use cases, support self-serve development, evolution and sustainment
- Continue to leverage AVEVA PI System as an integration, applications and analytics infrastructure with integration with other operational and business intelligence systems

Energy (Oil, Gas & Energy Industry) | United States of America

Standardized templates to ensure data representation and analysis consistency across locations

Challenge

- Operational data was stored in silos and made consuming data a daunting task
- Sharing large data collections and analyses was cumbersome
- Reduced agility due to complex analyses

Solution

- Converged multiple PI servers into a centralized PI Environment to streamline data collection, data access, analysis and reporting

Results

- **Hierarchical PI Asset Framework structure made it easier to manage data, ensured consistency and scalability for future operational needs**
- **Facilitated collaboration across teams to set and measure key performance indicators (KPIs)**
- **Actionable insights enhanced operational efficiency, enabling us to address issues quickly and reduced downtime, maintenance costs & energy usage**

Thank You

Arturo Solis

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