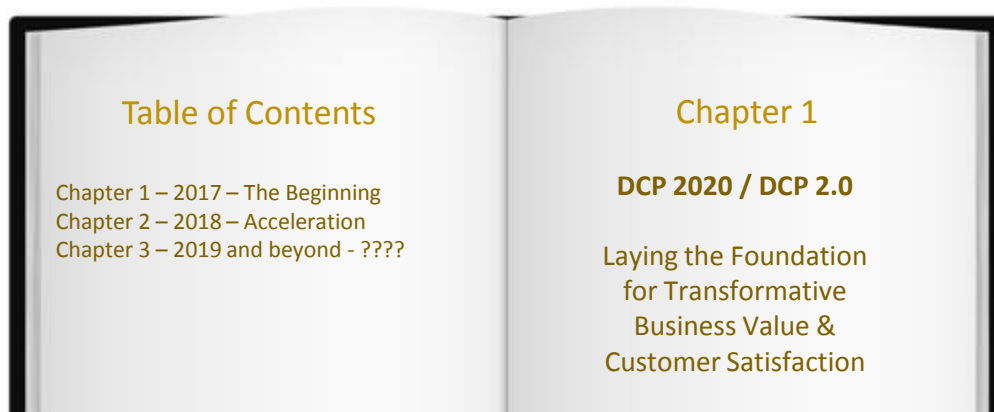


# Enabling Business Transformation with the PI System:



## The DCP 2.0 Journey

**Kevin Milliman, Director, Capital Projects**  
**Damon Vinciguerra, PI System Admin & Developer**



# Forward-Looking Statements



## **Under the Private Securities Litigation Act of 1995**

This document may contain or incorporate by reference forward-looking statements regarding DCP Midstream, LP (the “Partnership” or “DCP”) and its affiliates, including projections, estimates, forecasts, plans and objectives. Although management believes that expectations reflected in such forward-looking statements are reasonable, no assurance can be given that such expectations will prove to be correct. In addition, these statements are subject to certain risks, uncertainties and other assumptions that are difficult to predict and may be beyond our control. If one or more of these risks or uncertainties materialize, or if underlying assumptions prove incorrect, the Partnership’s actual results may vary materially from what management anticipated, estimated, projected or expected.

The key risk factors that may have a direct bearing on the Partnership’s results of operations and financial condition are described in detail in the Partnership’s periodic reports most recently filed with the Securities and Exchange Commission, including its most recent Forms 10-Q and 10-K. Investors are encouraged to consider closely the disclosures and risk factors contained in the Partnership’s annual and quarterly reports filed from time to time with the Securities and Exchange Commission. The Partnership undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise except as required by applicable securities laws. Information contained in this document speaks only as of the date hereof, is unaudited, and is subject to change.

# Outline

- DCP at a Glance
- Overview of DCP 2.0
- PI System Selection and Implementation Approach
- Chapter 1 Highlights
- Best Practices & Lessons Learned
- Chapter 2 Focus and Deliverables
- Summary

# DCP Midstream - Who We Are



- **We provide the full range of midstream services**
  - Gas gathering, compression, treating, and processing
  - Natural gas liquid (NGL) production and fractionation
  - Condensate recovery
  - Transportation, storage and sales of residue gas, NGL, and propane
- **One of the largest U.S. natural gas processing companies**
- **One of the largest U.S. producers of NGLs**
- **One of the largest NGL pipeline operators**

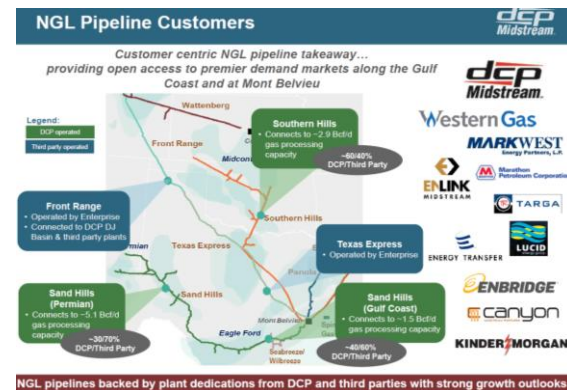
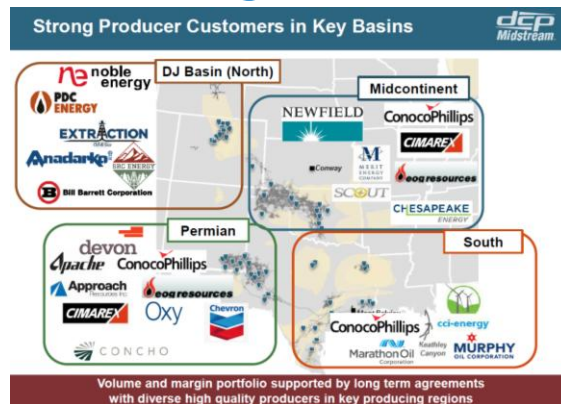
## Fast Facts

- 61 Gas Plants
- 57,000 Miles of gathering PL
- >400 Booster Stations
- 1400+ Compression Units
- 1M+ gathering system HP
- >42,000 meters
- 4,500 miles NGL PL

**Through our *DCP 2020* strategic framework, DCP is committed to being sustainable in any market environment**

# Vision of Differentiation & Digital Value Chain

- Large portfolio of E&P customers who have G&P options
- Differentiation with low cost, reliability, and service
- Our vision is to leverage digital value chain to provide unparalleled service



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# Recognition of OT Data & Information as Strategic Asset

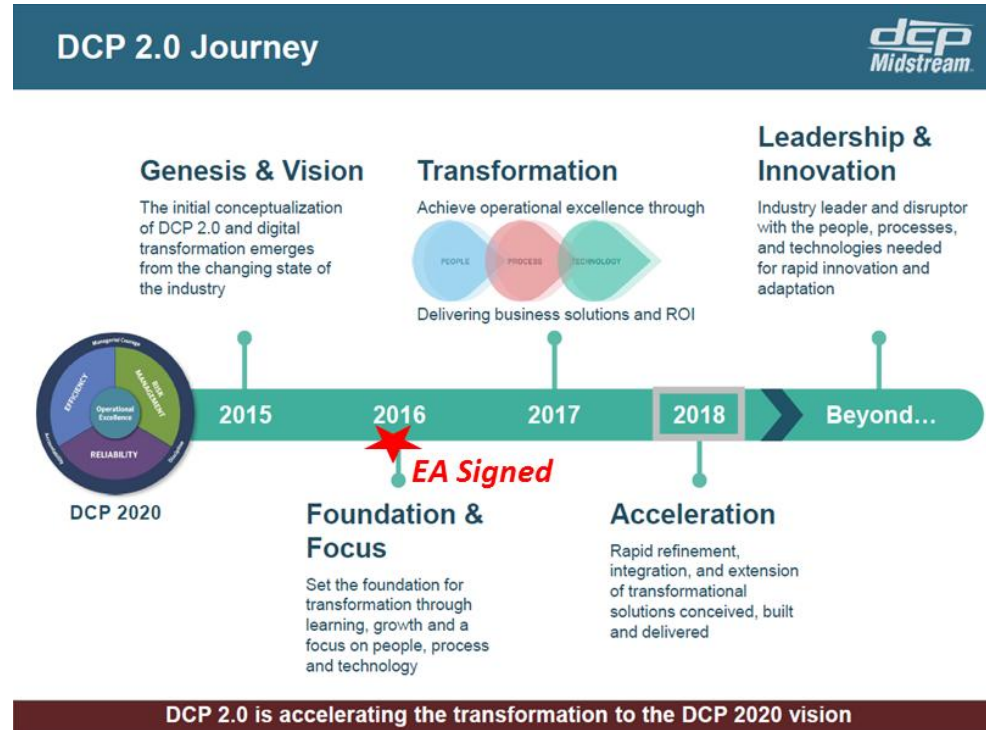
- DCP2020 Strategy & Vision Framework - 2015
- Digitally enabled operational excellence
- Major focus on foundation & cultural alignment - 2016
- Rapid rollout and momentum
- From 4 in 2016, DCP 2.0 team has grown to ~50 people





# Recognition of OT Data & Information as Strategic Asset

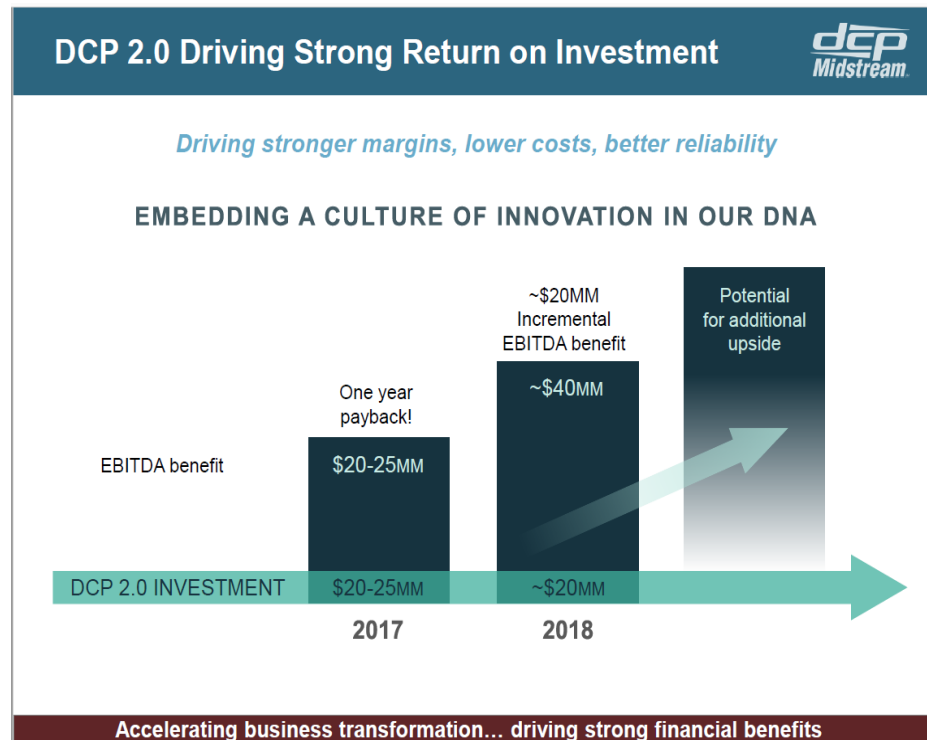
- DCP2020 Strategy & Vision Framework - 2015
- Digitally enabled operational excellence
- Major focus on foundation & cultural alignment - 2016
- Rapid rollout and momentum
- From 4 in 2016, DCP 2.0 team has grown to ~50 people





# Delivering Disruptive & Transformative Business Value

- \$20MM-25MM investment in 2017
- ~1 year Payback!
- Projected incremental \$20MM EBITDA in 2018
- Continuing to drive EBITDA impact 2019+

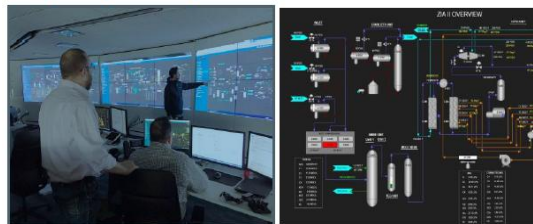


# DCP 2.0 at Work

## Business Transformation In Action: Operations of the Future - Now

- People, Process & Technology
- The PI System and PI AF underpins the ICC and associated apps & solutions
- Energy Lab rapidly develops digital solutions using PI System data and infrastructure as key technology stack component

### Integrated Collaboration Center (ICC) the operations of the future



- ICC ties multiple data sources, including SCADA, engineering data, contracts, real-time market prices, financial systems, KPIs and daily theoretical margins
- Facilitates real-time decisions... driving asset optimization throughout the full business value chain
- 30 of 61 plants currently on the ICC platform... remaining by the end of 2018

### Business Solutions



- Energy Lab rapidly develops digital solutions, including apps, to automate, streamline and digitize work streams
- Deployed 12 solutions to optimize workflow, automate processes, improve compliance, reduce costs and solve employee and customer pain points
- Now accelerating additional solutions throughout operations, commercial and corporate functions

~50 employees  
dedicated to  
DCP 2.0

Higher margins

Significant cost  
savings

Tens of  
thousands of  
reduced work  
hours

Better reliability  
and safety

Culturally transforming the way we work through process optimization and digitization

# Digital Solutions Deployed & Processes Improved



Customer Dashboard



Performance Dashboard



Operator Rounds



Tanks



Imagine DCP



Compression Health



Leak App

Ops Tools



Blowdown App



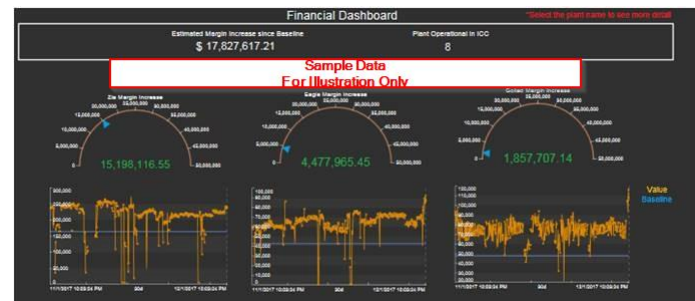
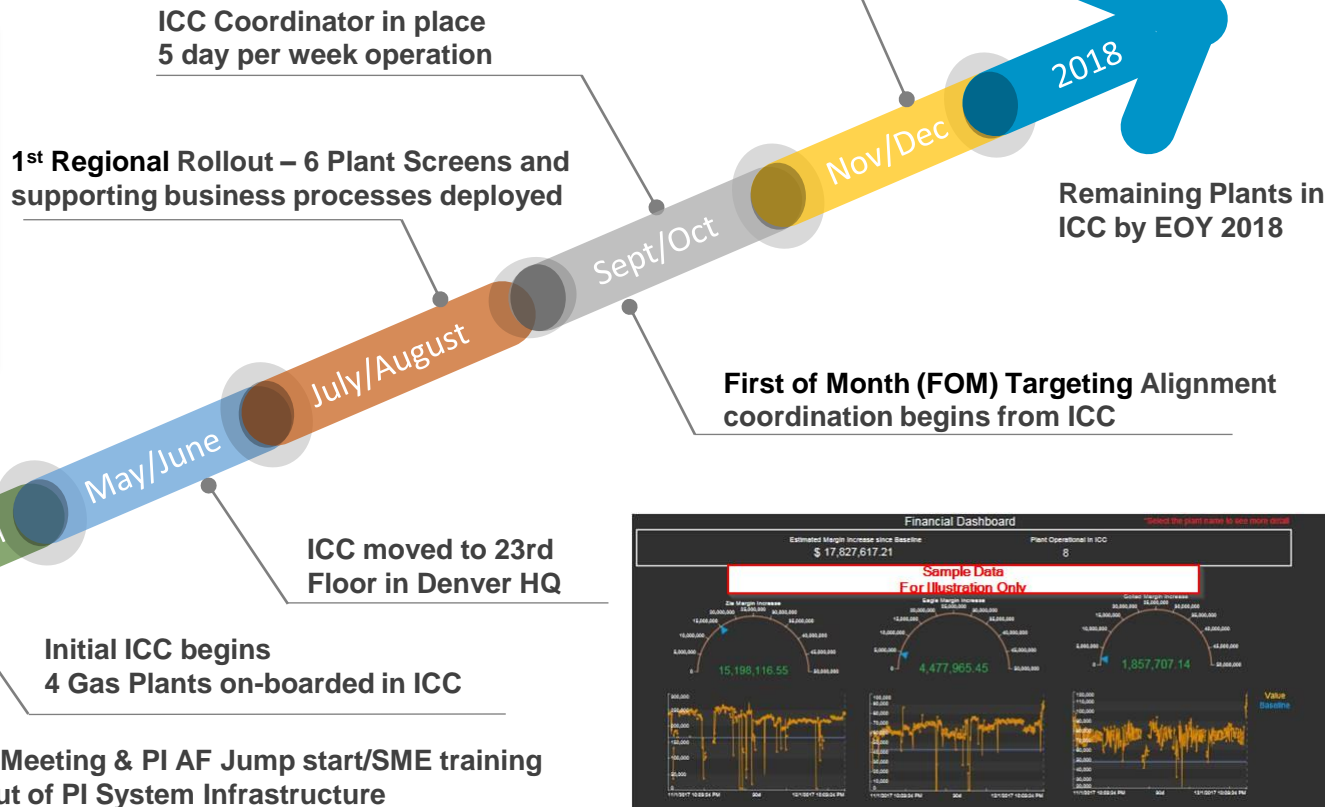
Workplace

From 2 to 5  
Agile Delivery Teams

Agile Methodology defined and  
adopted

Tech Stack and Design System  
architected, built, and implemented

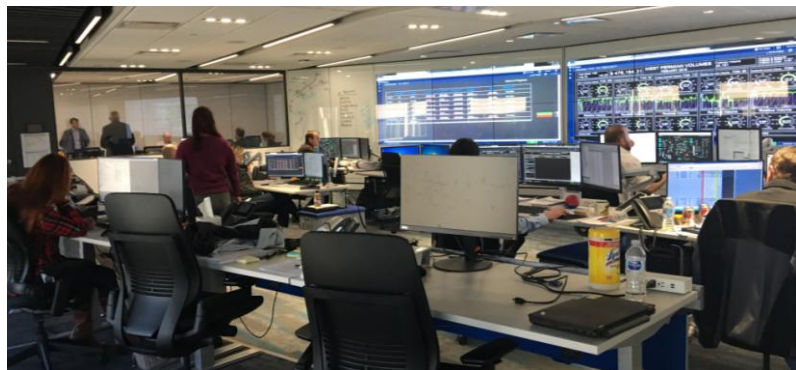
# ICC Rapid Standup & Transition





# The Integrated Collaboration Center (ICC)

## Business Transformation In Action: Operations of the Future - Now



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# Data Foundations - Embracing the Challenge

***We need a deep understanding of our operational data in context, transformed into information and knowledge, but:***

- Our existing data architecture was focused on process control and operations, with analytics and reporting almost an after-thought
- There was no centralized and normalized set of operational data across the company
- Multiple versions of the “truth,” often in spreadsheets that were emailed to multiple parties

***To get our operational data house in order, we deployed an enterprise-wide PI System***



# Why OSIsoft, the PI System, and the EA?

- **Key Considerations:**

- Performance, Scalability, Reliability, and Security (cyber & data)
- Integration with other systems
- Rapid deployment
- Keeping control systems (DCS and SCADA) focused on control
- Keeping up with ever evolving technological changes
- Empowerment & innovation
- Self sufficiency



- **Strong OSIsoft and the PI System Value proposition:**

- Enterprise OT infrastructure – agnostic, scalability, performance, reliability
- Analytics platform
- Cyber/data security & governance
- World class support - Account manager, NOC, Tech Support, Company
- PI System community – large E&P customer base

***To rapidly attain DCP2020 Strategy, Vision, & Value, we chose  
an Enterprise Agreement***

# Our Approach to Rapid Implementation & Value



- 1. Hybrid PI AF Jump Start & SME Training with EA KO Meeting:**
  - ✓ Naming conventions – Element, category, attributes, expression syntax, etc.
  - ✓ PI AF structure, architecture & integration with SCADA/DCS/IT Systems
  - ✓ PI AF governance - SMEs guide, product team implement, PI Team provides standardization & QA
- 2. Leveraged Enterprise Agreement – COE, EPM, rapid stand up of PI System**
- 3. Rapid, agile method, heavy use of PI AF/PI Vision Templates**
  - ✓ Deployment team worked on 2 parallel tracks: data connections/tag creation and product development
- 4. Formation of in-house PI Team augmented with OSIsoft COE and SIs**
- 5. EA Governance – Parallel Leadership teams, Executive Sponsors, KPIs, quarterly leadership team meetings**

# Our PI System Enterprise Architecture



## • PI System Infrastructure (full HA)

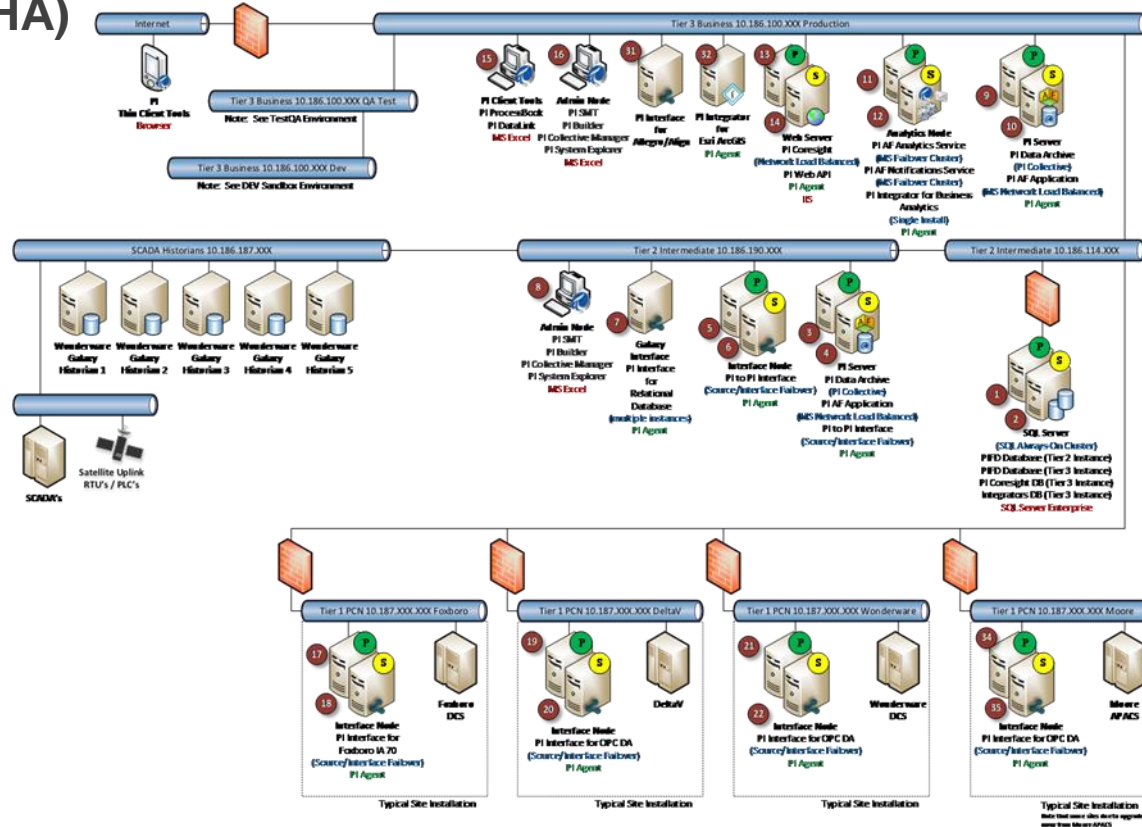
- 4 PI Archives~ 580,000 tags
- 96+ Interfaces
- PI AF ~ 8,200 elements
- PI Vision ~ 320 displays

## • Templates:

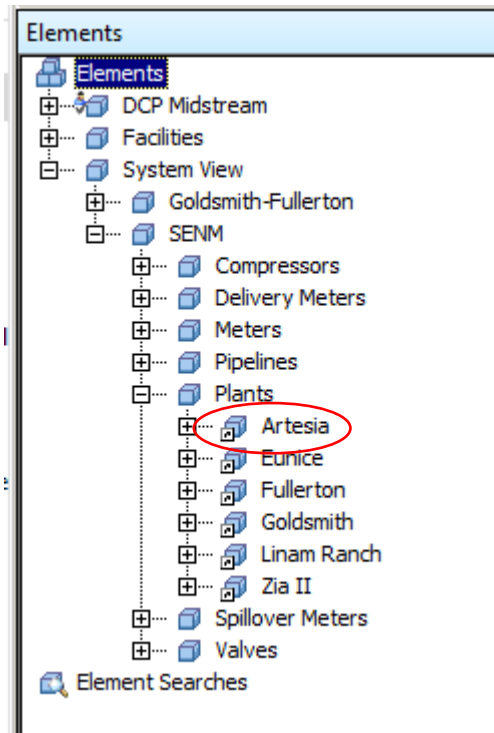
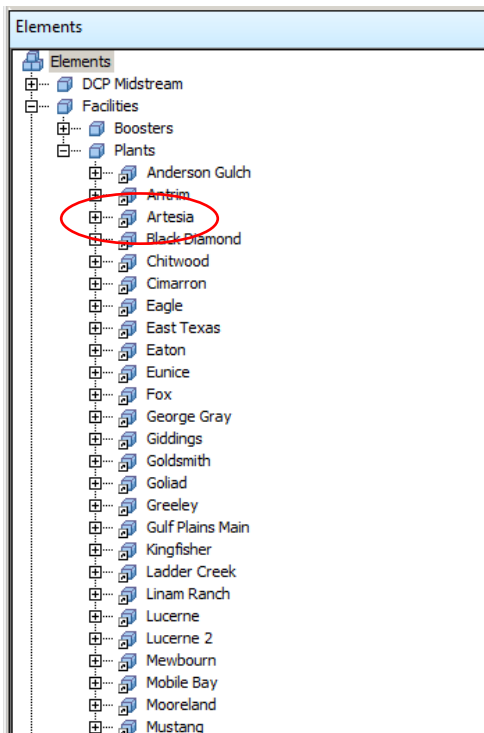
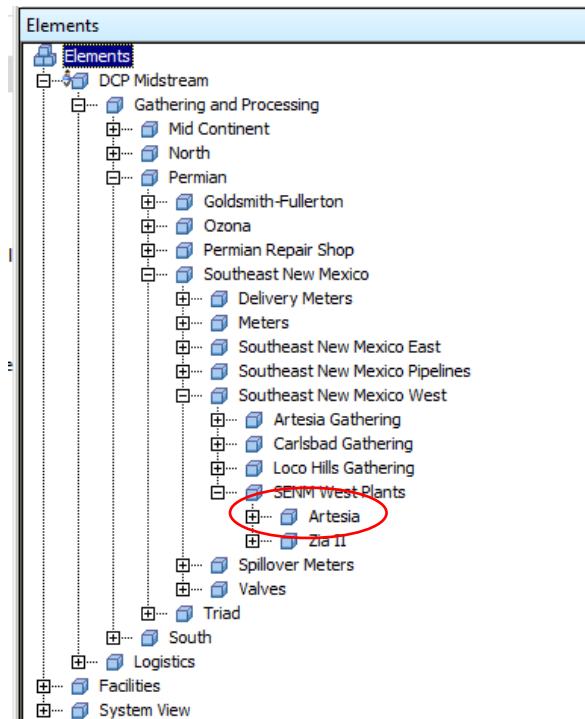
- ~ 325 PI AF Element
- ~ 55 Event Frames
- ~ 90 notifications

## • Integrators:

- Business Analytics(BA)
- ESRI ArcGIS
- Azure & PI Cloud Connect



# Developing PI AF – OT Data with Structure



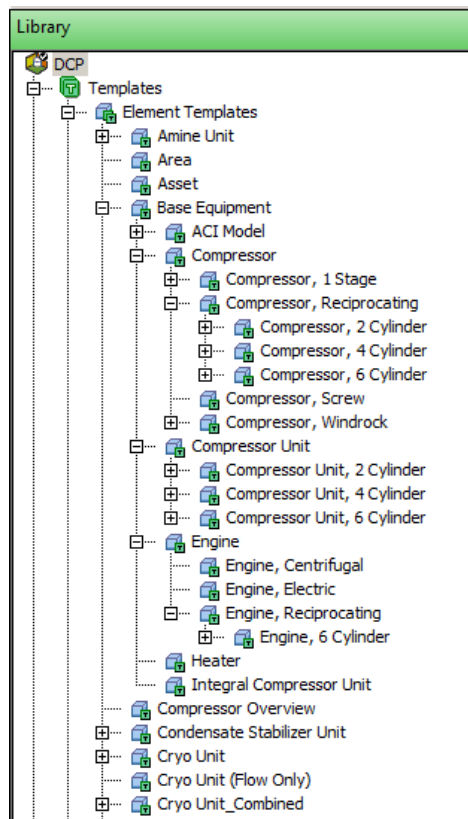
# The Power of PI AF Templates

## Elements

- ~325 Templates
- ~8,200 elements

## Analyses

- ~ 900 Templates
- ~103,000 analyses



A screenshot of the PI AF 'Cryo Unit' analysis template. The template is displayed in a window with tabs for 'General', 'Attribute Templates', 'Ports', 'Analysis Templates', and 'Notification Rule Templates'. The 'Analysis Templates' tab is selected, showing a table of analysis points. The table has columns for 'Name', 'Description', and 'Default Value'. The analysis points are grouped into categories: 'Bottoms Reboiler', 'Chiller', 'Cold Separator', 'Demethanizer', and 'Expander Booster 1' and 'Expander Booster 2'.

Name	Description	Default Value
Category: Bottoms Reboiler		
Bottom Reboiler Inlet Temperature		0 °F
Bottom Reboiler NGL Return Temperature		0 °F
Bottom Reboiler NGL Supply Temperature		0 °F
Bottom Reboiler Outlet Temperature		0 °F
Category: Chiller		
Category: Cold Separator		
Cold Separator Level		0 %
Cold Separator Liquid To Demethanizer Flow		0 MMscfd
Cold Separator Liquid To Demethanizer Flow Control Valve Position		0 %
Cold Separator Liquid To Reflux Flow		0 MMscfd
Cold Separator Liquid To Reflux Flow Control Valve Position		0 %
Cold Separator Pressure		0 psig
Cold Separator Temperature		0 °F
Category: Demethanizer		
De-methanizer Bottoms Level		0 %
De-methanizer Bottoms Temperature		0 °F
De-methanizer Overhead Pressure		0 psig
De-methanizer Overhead Temperature		0 °F
Category: Expander Booster 1		
Category: Expander Booster 2		

# Ability to do Predictive Analytics in PI AF

Example Element: [DCP Midstream\Gathering and Processing\North\DJ Basin\Weld County Super\Weld County Super Plants\Lucerne](#)

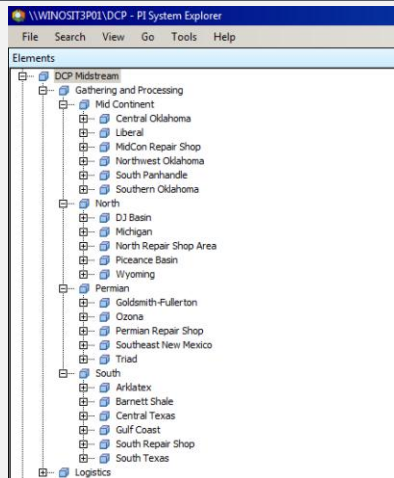
[Add a new variable](#) ⌵ ⌵ Evaluate

Name	Expression	Output Attribute	
GasDay	<code>IF Hour('*') &lt; 8 THEN 'y+8h' ELSE 't+8h'</code>	<a href="#">Map</a>	⊗
ResidueVolDTDRealtime	<code>//Final value for previous day at 8 AM CST IF BadVal(TagTot('Residue Outlet Total Flow', GasDay, '*')) THEN NoOutput() ELSE TagTot('Residue Outlet Total Flow', GasDay, '*')</code>	<a href="#">Residue Outlet Total Volume DTD Realtime</a>	⊗
SecondsRemaining	<code>86400-Int('*'-GasDay)</code>	<a href="#">Map</a>	⊗
PredictedVol	<code>ResidueVolDTDRealtime + 'Residue Outlet Total Flow'*SecondsRemaining/86400</code>	<a href="#">Residue Outlet Total Volume (Predicted)</a>	⊗
Variance	<code>PredictedVol - 'Residue Outlet Total Volume (Predicted) Target'</code>	<a href="#">Residue Outlet Total Volume (Predicted) Variance from Target</a>	⊗
ResidueEnergyDTDRealtime	<code>//Final value for previous day at 8 AM CST IF BadVal(TagTot('Residue Outlet Total Energy Flow', GasDay, '*')) THEN NoOutput() ELSE TagTot('Residue Outlet Total Energy Flow', GasDay, '*')</code>	<a href="#">Residue Outlet Total Energy Flow DTD Realtime</a>	⊗
PredictedEnergy	<code>ResidueEnergyDTDRealtime + 'Residue Outlet Total Energy Flow'*SecondsRemaining/86400</code>	<a href="#">Residue Outlet Total Energy Flow (Predicted)</a>	⊗

Scheduling: ☐ Event-Triggered ☒ Periodic  
Period: 00h 05m 00s [Configure](#) [Advanced...](#)

# DCP Midstream PI System Development

## Building the Tools for Reliability



### PI Asset Framework (PI AF)

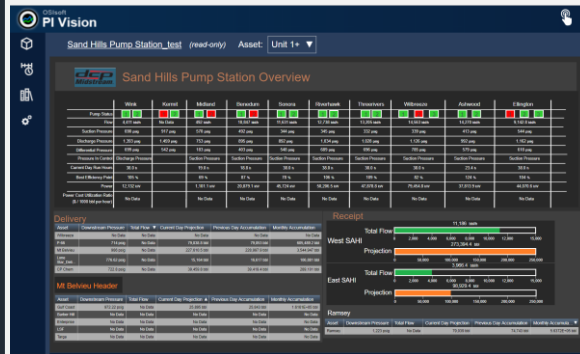
Develop Hierarchy of Gas Plant, Compressor Station, Gathering System and Pipeline Assets

Organization of Data Into Useful Sets

Standardization Across Sites

Templates for Scalability

Translation/Integration With Other Business Systems



### PI Vision

Dashboards for Operational Monitoring

Multiple Sources of Data Combined Into Single View

Pair Analytics w/Real-Time Values

Single Point Access Across Organization

From: [PINotifications@dkmidstream.com](mailto:PINotifications@dkmidstream.com) [mailto:PINotifications@dkmidstream.com]  
Sent: Monday, October 09, 2017 2:40 AM  
To: Babu, Joshua D  
Subject: Engine Cylinder Temp Deviation on C193 at Wells Ranch (2017-10-09 02:35) generated a new notification event.

Event: Engine Cylinder Temp Deviation on C193 at Wells Ranch (2017-10-09 02:35)  
Name: Engine Cylinder Health  
Server: WINOSIT3101  
Database: DCP Midstream  
Start Time: 10/9/2017 2:35:00 AM Mountain Daylight Time (GMT-06:00:00)  
Target: DCP Midstream/Gathering and Processing/North/DJ Basin/Weld County Super/Weld Gathering/Wells Ranch/C193/Engine  
Severity: None  
Send Time: 10/9/2017 2:40:06 AM Mountain Daylight Time (GMT-06:00:00)

Please reference the table below for Cylinder Temperatures that triggered this notification:

Cylinder	Temperature at Notification (°F)	Offset (°F)
1 L	1337.30004882813	0
1 R	1339	0
2 L	1349.19995117188	0
2 R	1350.30004882813	0
3 L	1356	0
3 R	1340.69995117188	0
4 L	1346.5	0
4 R	1354.90002441406	0
5 L	2498	-1200
5 R	1342	0
6 L	839.200012207031	75
6 R	1315.69995117188	0

### PI Alerts & PI Notification

24/7 Monitoring & Communication of Anomalies

Failure Detection, Efficiency Monitoring, Work Mgmt.

Improve Operational Awareness

Eliminate "Digging" for Issues



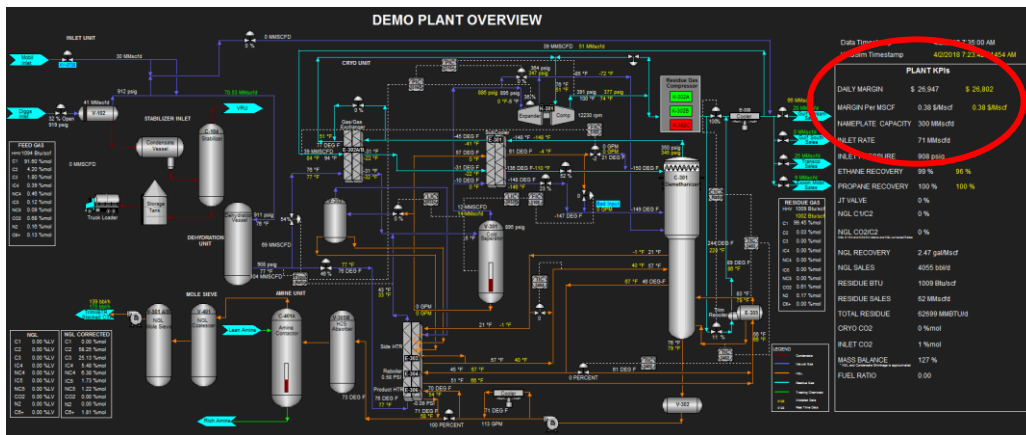
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# Real Time Operational & Financial Targets

Using Operational, Process Simulation and Financial Data to Optimize Plant Performance

Case Study: Real-time Process Simulation and Financials Provide Operating Targets and Potential Value Improvement



PLANT KPIs		
DAILY MARGIN	\$ 26,947	\$ 26,802
MARGIN Per MSCF	0.38 \$/Mscf	0.38 \$/Mscf
NAMEPLATE CAPACITY	300 MMscfd	
INLET RATE	71 MMscfd	
INLET PRESSURE	908 psig	
ETHANE RECOVERY	99 %	96 %
PROPANE RECOVERY	100 %	100 %

## Background

- Optimal plant operation depends on many factors including feed composition, operating mode, plant and equipment design
- Target operating (e.g. temperatures, pressures) were not readily accessible
- Incremental value of operating at optimal conditions was unknown

## Solution

- Linking process simulations to PI data & layers of analytics provides operating parameters for the plant at optimal conditions
- Financial info linked to real time and modeled data provides current and potential value of plant operation
- Real time optimized operating and financial data provide definitive targets for operators

## Results

- More accurate, consistent and reliable plant operations provides significant margin improvement
- Quantifying impact of sub-optimal operation allows effective prioritization of plant maintenance and small capital projects
- Visibility to plant capability, current status and associated value is fundamental to ICC operation

# Example of a Gas Plant Financial Calculation

Add a new variable			Evaluate
Name	Expression	Output Attribute	
ProducerNGLnC4	Convert('Producer NGL Volume nC4',"gpd") * 'Producer NGL nC4 Price'	Map	
ProducerNGLiC5	Convert('Producer NGL Volume iC5',"gpd") * 'Producer NGL iC5 Price'	Map	
ProducerNGLnC5	Convert('Producer NGL Volume nC5',"gpd") * 'Producer NGL nC5 Price'	Map	
ProducerNGLC6P	Convert('Producer NGL Volume C6P',"gpd") * 'Producer NGL C6P Price'	Map	
ProducerNGLCost	ProducerNGLC2 + ProducerNGLC3 + ProducerNGLiC4 + ProducerNGLnC4 + ProducerNGLiC5 + ProducerNGLnC5 + ProducerNGLC6P	Gross Margin Producer NGL Cost	
Part6	6 // Pipeline Revenue	Map	
PipelineRevenue	('NGL Outlet 1 Uplift' * Convert('NGL Outlet 1 Contract Portion',"frac") + 'NGL Outlet 2 Uplift' * Convert('NGL Outlet 2 Contract Portion',"frac") + 'NGL Outlet 3 Uplift' * Convert('NGL Outlet 3 Contract Portion',"frac") ) * Convert('.\Cryo Unit NGL Outlet 1 Contract Portion',"frac")	Gross Margin Pipeline Revenue	
Part7	7 // Totals	Map	
Margin	IF BadVal(ResidueRevenue+NGLRevenue+FeeRevenue-ProducerResidueCost-ProducerNGLCost+PipelineRevenue) THEN DigState("Bad Input") ELSE ResidueRevenue+NGLRevenue+FeeRevenue-ProducerResidueCost-ProducerNGLCost+PipelineRevenue	Gross Margin	

# Tracking Plant Downtime and Causes

*Event Frames, Notifications and Reason Codes to Improve Plant Reliability*

Example Element: [DCP Midstream\Gathering and Processing\North\DJ Basin\Weld County Super\Weld County Super Plants\Lucerne](#)

Event Frame Template: Plant Down

Add... True for Severity Evaluate

Name	Expression
<input type="checkbox"/> Start triggers	
StartTrigger1	'.\Inlet Liquids Handling Unit Plant Inlet Total Flow' < 'Plant Uptime Minimum Flow'

1 hours Warning

Scheduling: ☐ Event-Triggered ☒ Periodic  
Period: 00h 05m 00s, Offset: 00h 01m 00s Configure

PI Vision

Plant Down

New Display Ad Hoc Display ONE\DAVinciguerra ?

### All Unacknowledged Events

Regardless of event time

Event Name	Asset	Start Time	End Time	Duration	Reason	Acknowledged By	Acknowledgement
Mobile Bay Plant is down	MOBILE BAY	4/9/2018 9:36:00 AM	In Progress	2h 22m			<span>Acknowledge</span>

### Acknowledged Events

Within Time Period Selected

Event Name	Asset	Start Time	End Time	Duration	Reason	Acknowledged By	Acknowledgement
Eunice Plant is down	EUNICE	3/23/2018 7:06:00 PM	4/6/2018 2:39:52 PM	13d 19h	Other Communication	ONE\jipelli	Acknowledged
Cimarron Plant is down	CIMARRON	4/1/2018 1:56:00 PM	4/3/2018 9:36:00 AM	1d 19h	Unplanned Field	ONE\Williams	Acknowledged
Giddings Plant is down	GIDDINGS	4/2/2018 12:16:00 PM	4/2/2018 3:46:00 PM	3h 30m	Other Communication	ONE\jipelli	Acknowledged

4/2/2018 11:58:32 AM 7d Now 4/9/2018 11:58:32 AM

# The Smart Gas Plant – “Layers of Analytics”

## Near Real-Time Financial Optimization



- End to end view of plant
- Operational and financial targets
- PvA calculations



Physical Gas Plant

Unit	Value
Amine Unit	1.0
Compressor Group, Acid Gas	1.0
Compressor Group, Inlet	1.0
Compressor Group, Residue	1.0
Condensate Stabilizer Unit	1.0
Cryo Unit	1.0
Flare Stack	1.0
Inlet Liquids Handling Unit	1.0
Mole Sieve Unit	1.0
Refrigeration Unit	1.0
TEG Unit	1.0

Unit	Value
Amine Unit	1.0
Compressor Group, Acid Gas	1.0
Compressor Group, Inlet	1.0
Compressor Group, Residue	1.0
Condensate Stabilizer Unit	1.0
Cryo Unit	1.0
Flare Stack	1.0
Inlet Liquids Handling Unit	1.0
Mole Sieve Unit	1.0
Refrigeration Unit	1.0
TEG Unit	1.0

Digital Gas Plant

Category	Value
Amine Unit	1.0
Compressor Group, Acid Gas	1.0
Compressor Group, Inlet	1.0
Compressor Group, Residue	1.0
Condensate Stabilizer Unit	1.0
Cryo Unit	1.0
Flare Stack	1.0
Inlet Liquids Handling Unit	1.0
Mole Sieve Unit	1.0
Refrigeration Unit	1.0
TEG Unit	1.0

Gas Plant asset configurable templates

### Optimization Model VMGSim



OPC Client Link

- Amine Unit
- Amine Unit 2
- Compressor Group, Acid Gas
- Compressor Group, Inlet
- Compressor Group, Residue
- Condensate Stabilizer Unit
- Cryo Unit
- Flare Stack
- Inlet Liquids Handling Unit
- Mole Sieve Unit
- Refrigeration Unit
- TEG Unit

PI AF Linked Table

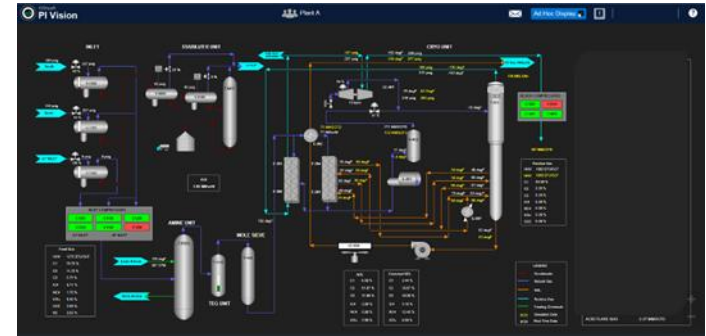
PI AF Linked Table

### Financial Table



- Real-time Commodity Pricing
- Financials based on contract mix

### Gas Plant Visualization including mobile



Visual Dashboards & Multidimensional Assessment

# Data & Trends for Condition Based Maintenance

PI Trends & PI Analytics to Maximize Component Life & Value



## Case Study: Real-time Trending and Immediate Notification to Monitor and Respond to Equipment Condition



From: [PINotifications@dcpmidstream.com](mailto:PINotifications@dcpmidstream.com) [mailto:PINotifications@dcpmidstream.com]  
Sent: Monday, October 09, 2017 2:40 AM  
To: Bobby, Joshua D  
Subject: Engine Cylinder Temp Deviation on C193 at Wells Ranch (2017-10-09 02:35) generated a new notification event

Event: Engine Cylinder Temp Deviation on C193 at Wells Ranch (2017-10-09 02:35)  
Name: Engine Cylinder Health  
Server: WINOSIT3T01  
Database: DCP Midstream  
Start Time: 10/9/2017 2:35:00 AM Mountain Daylight Time (GMT-06:00:00)  
Target: DCP Midstream Gathering and Processing/North/DJ Basin/Weld County Super/Weld Gathering/Wells Ranch/C193/Engine  
Severity: None  
Send Time: 10/9/2017 2:40:06 AM Mountain Daylight Time (GMT-06:00:00)

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1.L	1337.30004882813	0
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2.R	1350.30004882813	0
3.L	1356	0
3.R	1340.69995117188	0
4.L	1346.5	0
4.R	1354.90002441406	0
5.L	2498	-1200
5.R	1342	0
6.L	839.200012207031	75
6.R	1315.69995117188	0



### Background

- Historically, we used a control system-based monitoring (i.e. alarms and shut downs on small set of parameters)
- Limited advanced warning capability

### Solution

- Compression Health Monitoring Team Developed Standardized Tools and Analyses using Operational Data to Monitor Equipment & Improve Reliability
- Use PI Vision & Notifications to Trend and Flag Abnormal Operating Conditions
- Local work groups are using the PI system to expand and customize monitoring capabilities beyond our initial "centralized" tools

### Results

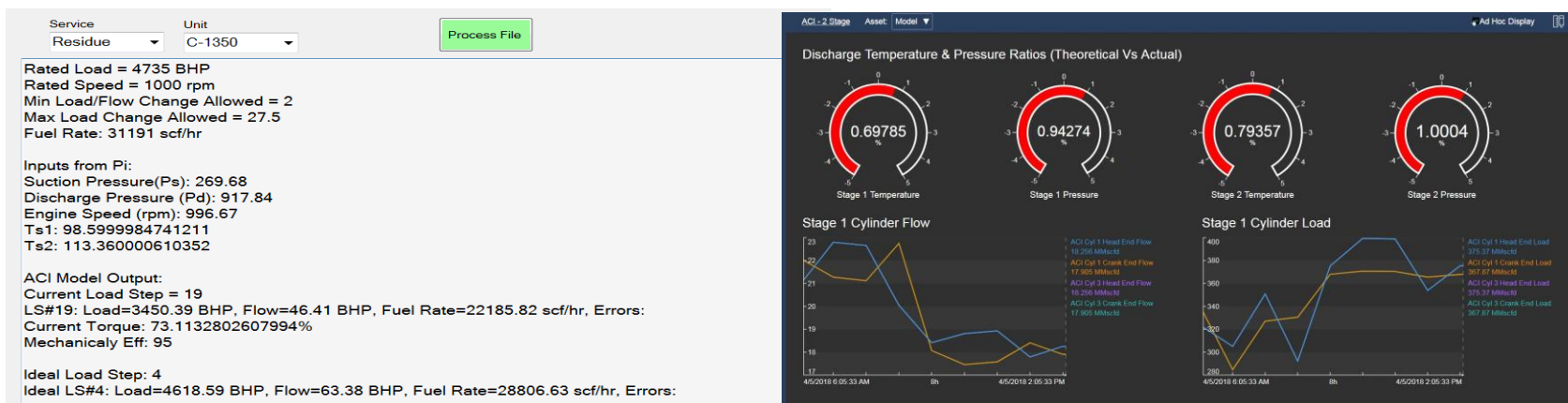
- More quickly identify and troubleshoot issues
- Reduce Frequency of Equipment Failures and associated downtime
- Simple first steps toward condition-based monitoring

# Real-Time Compression Optimization

Using PI AF & First Principles Models to Predict & Optimize Compressor Operations



## Case Study: Real-time Compressor Optimization using PI Data and First Principles Models



### Background

- Historically, we run compressor performance curves during design and then periodically to confirm proper performance
- Changes in gas volume, composition, field pressures can significantly change the optimal operating point

### Solution

- Compression Health Monitoring Team runs first principle models using real time PI data. Model output is used to define optimal compressor settings for current operation.
- PI Vision displays provides operating conditions based on optimal load step

### Results

- More quickly identify optimal compressor operating parameters
- Reduced operating costs
- Improved equipment reliability

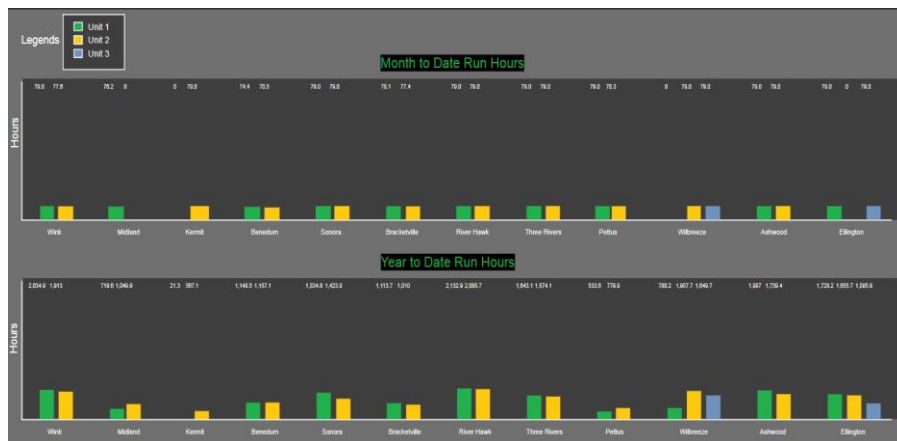


# Monitoring Pipeline Pump Rotation

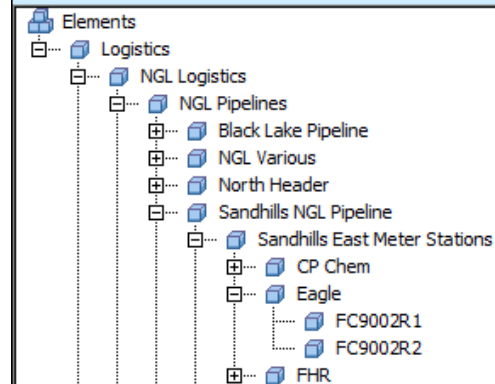
Using PI AF and Vision to Monitor NGL Pipeline Pump Operations



Case Study: Comparison of real time pipeline pump usage to ensure even wear and tear of pumps



## Elements



## Background

- Reliability and operation team spent a lot of time tracking down asset utilization in the past
- Under/Over utilized pumps are more likely to experience issues with seal failing, mud daubers getting in the motors, and other problems

## Solution

- PI Vision display of side by side pumps and pump stations throughout pipeline to compare and monitor run hours in current month and current year

## Results

- Reliability and operation team can now easily track pump utilization
- Control center can proactively manage which pump to run, thereby ensuring even wear and tear and minimizing equipment failure in the future

# Outline

- DCP at a Glance
- Overview of DCP2.0
- PI System Selection and Implementation Approach
- Chapter 1 Highlights
- **Best Practices & Lessons Learned**
- Chapter 2 Focus and Deliverables
- Summary

# A Little Bit of Wisdom.....



1. Focus on PI AF standards, structure, and governance
2. Get SMEs up to speed on PI AF & developing templates w/COE support
3. Establish PI COE and EA governance with KPIs for success
4. Use of PI System/PI AF/PI Vision with experienced SI
5. Just showing the data to the users is huge (requires good data quality)
6. Democratic versus Centralized
7. Transformation encompasses People, Process and Technology (and technology is the “easy” part)
8. EA to support digital transformation & rapid time to value

# If we had to do it over....



1. Simple starts and simply start
2. Develop broad PI System awareness, competency, and process to ensure full leverage
3. Keep an eye on the PI System roadmap and new functionality

# Outline

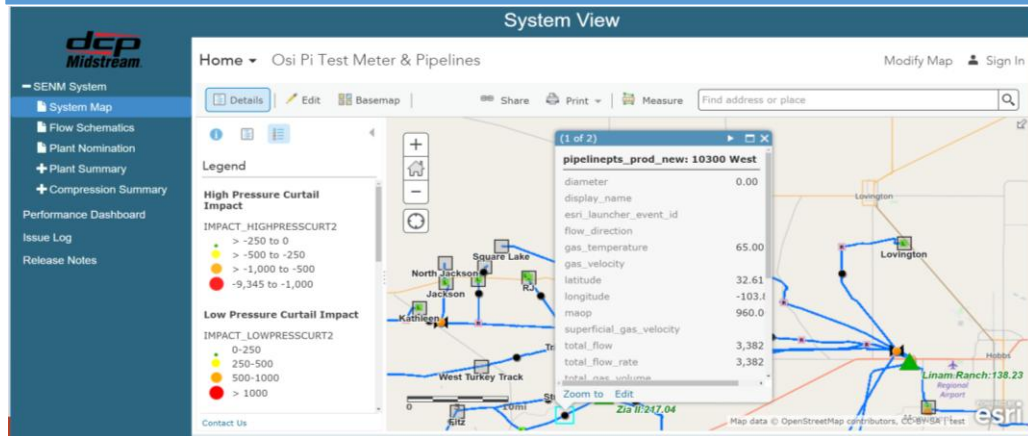
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# Linking Operational to Geographic Data

Using Operational and Geospatial Data to Optimize Gathering and Processing Performance



**Future Opportunity : Real-time operational data in space can lead to greater efficiencies and operating margin**



(1 of 2)	
pipelinepts_prod_new: 10300 West	
diameter	0.00
display_name	
esri_launcher_event_id	
flow_direction	
gas_temperature	65.00
gas_velocity	
latitude	32.61
longitude	-103.1
maop	960.0
superficial_gas_velocity	
total_flow	3,382
total_flow_rate	3,382
total_gas_volume	
Zoom to Edit	

## Background

- The midstream business is spread over a wide area, requiring lots of driving miles for operations and maintenance
- With its long distances and extensive interconnections, our gathering system operations must consider geography of our assets

## Solution

- Linking operating data with geospatial gathering system and pipeline information will allow rapid understanding of issues and responses to normal and upset conditions.

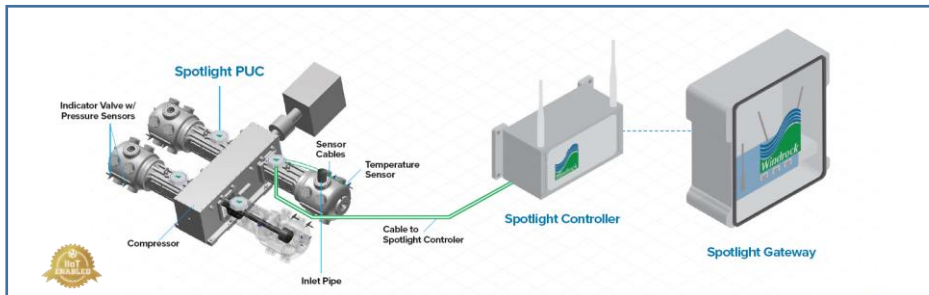
## Expected Results - KPIs

- Optimal gas routing
- Increased volumes
- Greater reliability
- Fewer miles driven

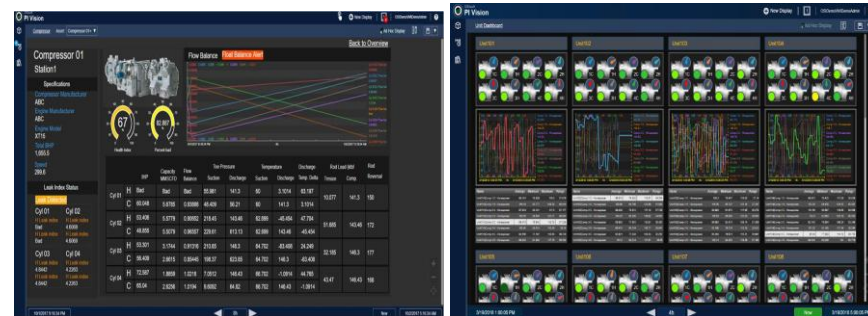
# IIOT Enabled Advance Machinery Analytics



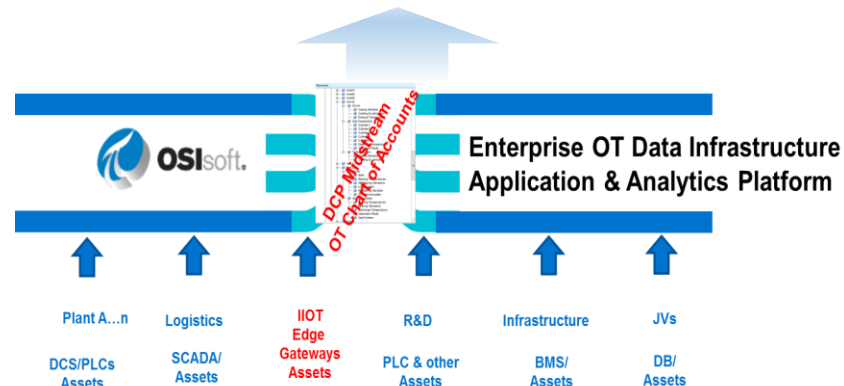
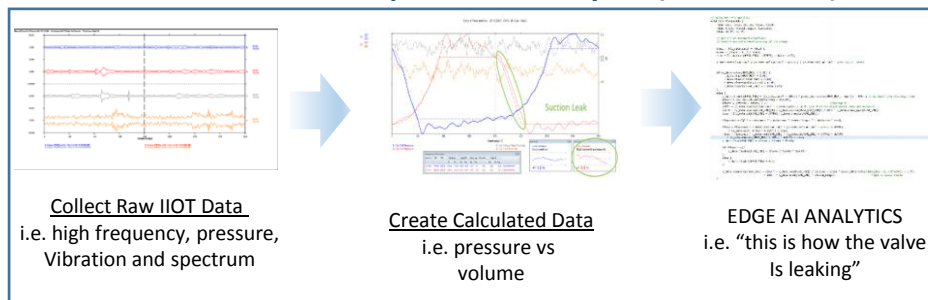
Spotlight Site Installation = 2 hrs  
IIOT sensory inputs that augments existing  
SCADA/PLC inputs in the PI System



Integrate with the PI System for Complete  
Cause and Effect Analytics via PI AF and PI Analytics  
Embed Windrock specialized analytics displays into PI Vision



## From Data to specialized Analytics (Cloud based)

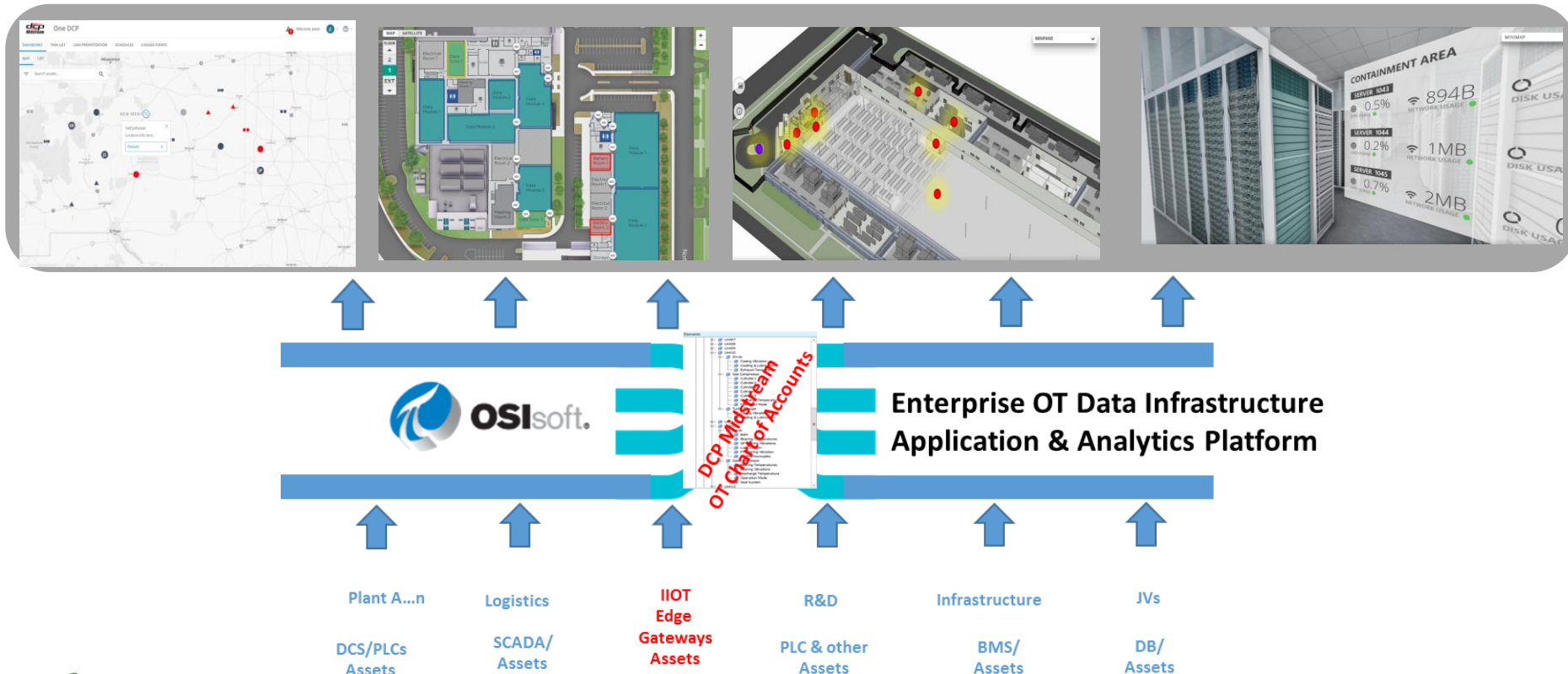




# The Smart Booster Station – Real-time VR

c**o**ncept3D

**dcp**  
Midstream



# Outline

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# Enabling Business Transformation with the PI System



Access to quality, timely, and contextualized data is fundamental to enabling DCP Midstream's Business Transformation and focus on empowering innovation and proactive data based decision making

## COMPANY AND GOAL

DCP Midstream provides a broad array of midstream services from the well head to market and wanted to use **data and information as a strategic asset** to enable a Business Transformation to deliver differentiated customer satisfaction, safety, & performance.



## CHALLENGE

Disparate data sources from SCADA, and DCS inhibiting ability to make timely, business decisions

- Multiple data sources
- Lack of tag and asset naming stds
- Low level of collaboration
- Average asset reliability and margin performance

## SOLUTION

Selected the PI System as a strategic enterprise OT infrastructure with an EA to underpin DCP2.0 Business Transformation and ICC

- Implemented multi-tiered PI System enterprise architecture in a rapid, agile method in 10 months
- Focus on PI AF-based OT data structure – abstraction, normalization, and context
- Enabled Business Transformation and Integrated Collaboration Center (ICC)

## RESULTS

Saved \$20MM-\$25MM in EBITDA benefit first year from improved gas plant operation, asset reliability, & ICC coordination

- Financial optimization of 30 gas plants (remainder in 2018)
- Reduced O&M costs & growth momentum from new projects
- More proactive/predictive vs reactive...a culture of innovation
- Improved customer service, satisfaction and differentiation

# Questions

Please wait for the **microphone** before asking your questions

State your **name & company**



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DCP Midstream

Merci

谢谢

Спасибо

Danke

Gracias

Thank You

감사합니다

ありがとう

Grazie

Obrigado

Optional: Click to add a takeaway you  
wish the audience to leave with.