

Best Practices in “Going Digital”

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2019 GAS/ELECTRIC PARTNERSHIP CONFERENCE ✦ February 6-7, 2019

Opportunities in Gas Infrastructure

Best Practices in “Going Digital” – The What



“4Ms”

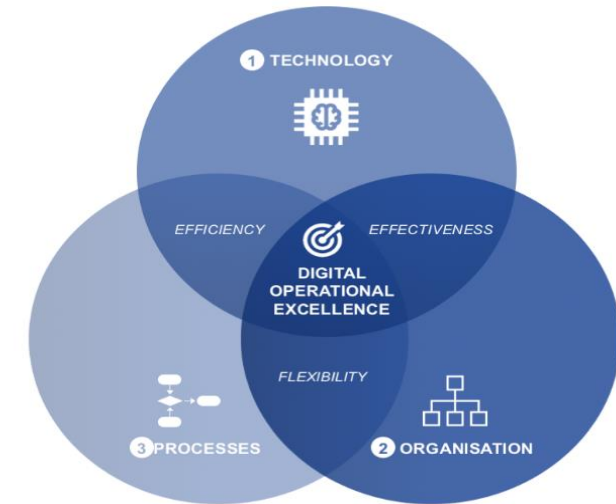
Make Me More Money..Safely

Alignment & Support of Strategic Business Objectives with KPIs & Accountability



**Lead by
Business/Operations (OT)
Supported by IT**

OT and IT



Reference: FOSTEC & Company

“Digitally” Accelerated Operational Excellence

- **Agility**
- **Empowerment**
- **Effectiveness**

Reference : DCP Midstream Web Site – DCP2.0

Best Practices in “Going Digital” – The How



Use of an Operational Data Infrastructure with configurable Digital Twin Templates



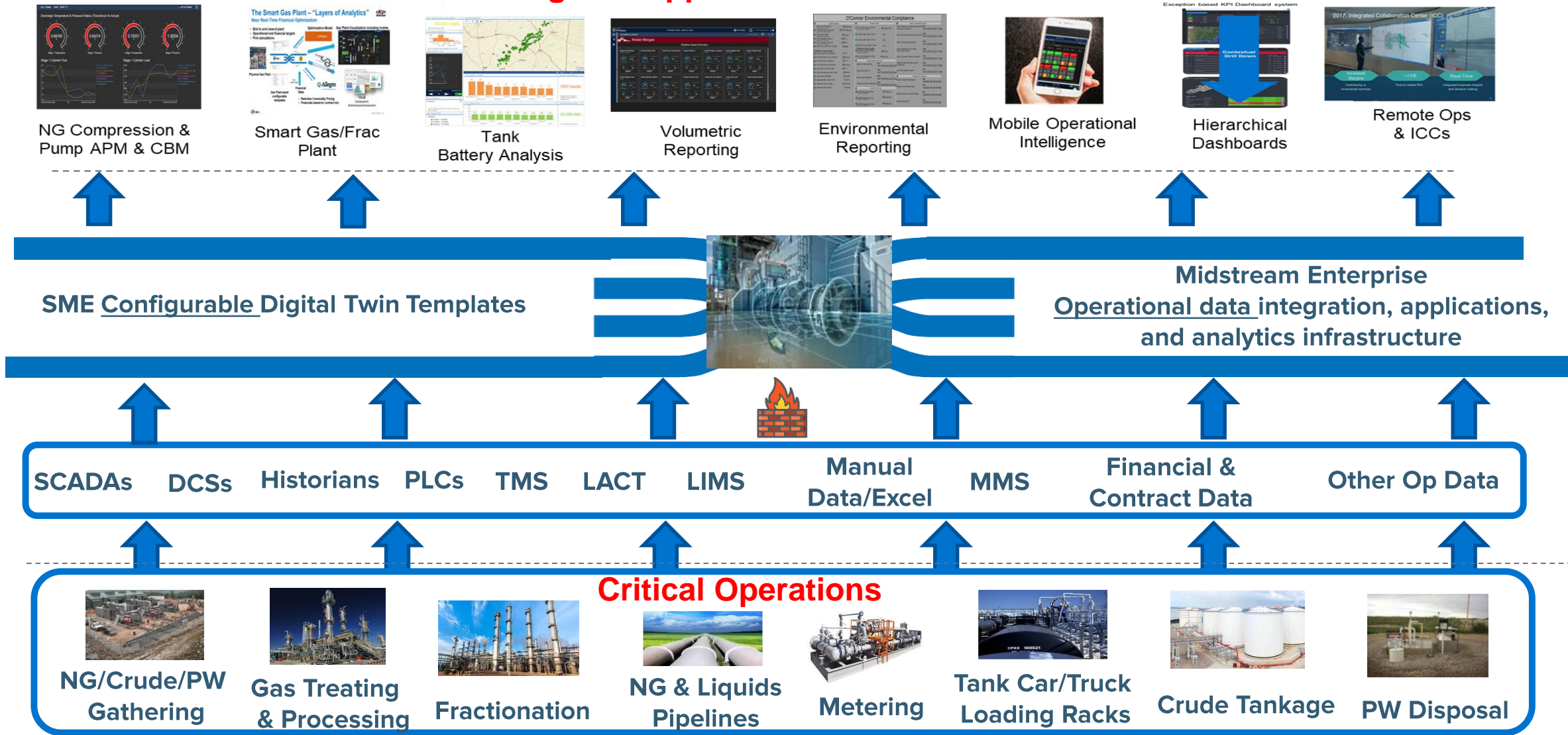
- Subject Matter Experts
- Organization - “in Context”
- Stakeholders



- Layers of “Analytics”
- Private/Public Clouds
- OT/IT “Data Lakes”

The Digitally Enabled Midstream Company

Configured Applications & Enabled Solutions



The Smart Gas Plant – “Layers of Analytics”

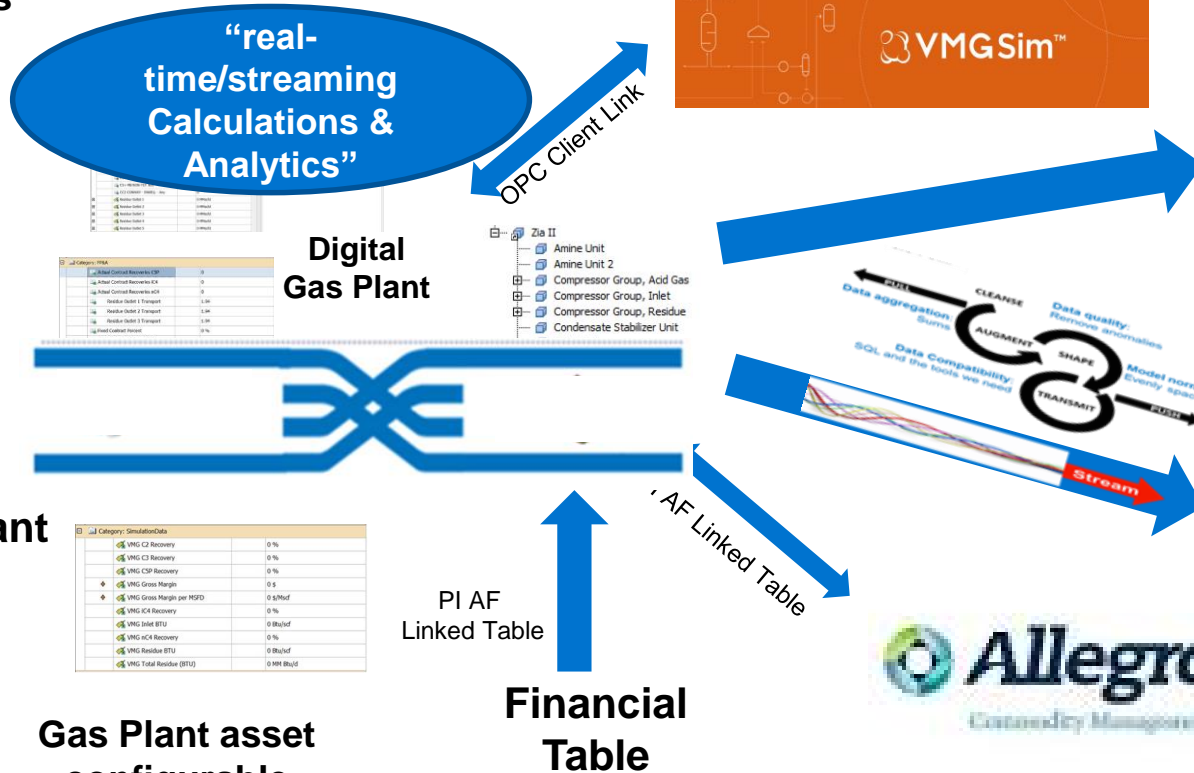
An Operational Data Analytics Infrastructure



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



Physical Gas Plant



| Category | Simulation Data | Value |
|---------------------------|-----------------|-------|
| VMG C2 Recovery | 0 % | |
| VMG C3 Recovery | 0 % | |
| VMG C4 Recovery | 0 % | |
| VMG C5 Recovery | 0 % | |
| VMG Gross Margin per MOPD | 0 \$ | |
| VMG C6 Recovery | 0 % | |
| VMG C7 Recovery | 0 % | |
| VMG C8 Recovery | 0 % | |
| VMG C9 Recovery | 0 % | |
| VMG C10 Recovery | 0 % | |
| VMG C11 Recovery | 0 % | |
| VMG C12 Recovery | 0 % | |
| VMG C13 Recovery | 0 % | |
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| VMG C96 Recovery | 0 % | |
| VMG C97 Recovery | 0 % | |
| VMG C98 Recovery | 0 % | |
| VMG C99 Recovery | 0 % | |
| VMG C100 Recovery | 0 % | |

Gas Plant asset configurable templates

Reference: DCP Midstream's PI World 2018 Presentation

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

Best Practices in “Going Digital”

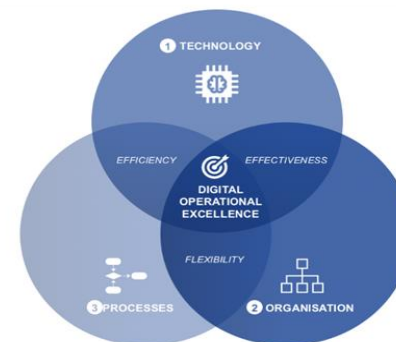


“4Ms”

Strategic Alignment & Support
of Business Objectives



Lead by Business
Supported by IT



Reference: [FOSTEC & Company](#)

“Digitally” Accelerated
Operational Excellence



Operational Data Infrastructure



Self Service Focused



Layers of Analytics from the
Edge to the Cloud

*Thank
you*



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Opportunities in Gas Infrastructure

The Foundation for OpEx is Operational Intelligence

Digitally
Enabled
Culture

Operational Excellence

Digitally
Enabled
Work Processes

Action

Accountability

Continuous Improvement

Operational Intelligence



OT chart of
accounts



Integration
Applications
Analytics

Operational Data
(OT) Infrastructure

Quality

Integration

Normalization

Context

Operational Data

SCADA

DCS

PLCs

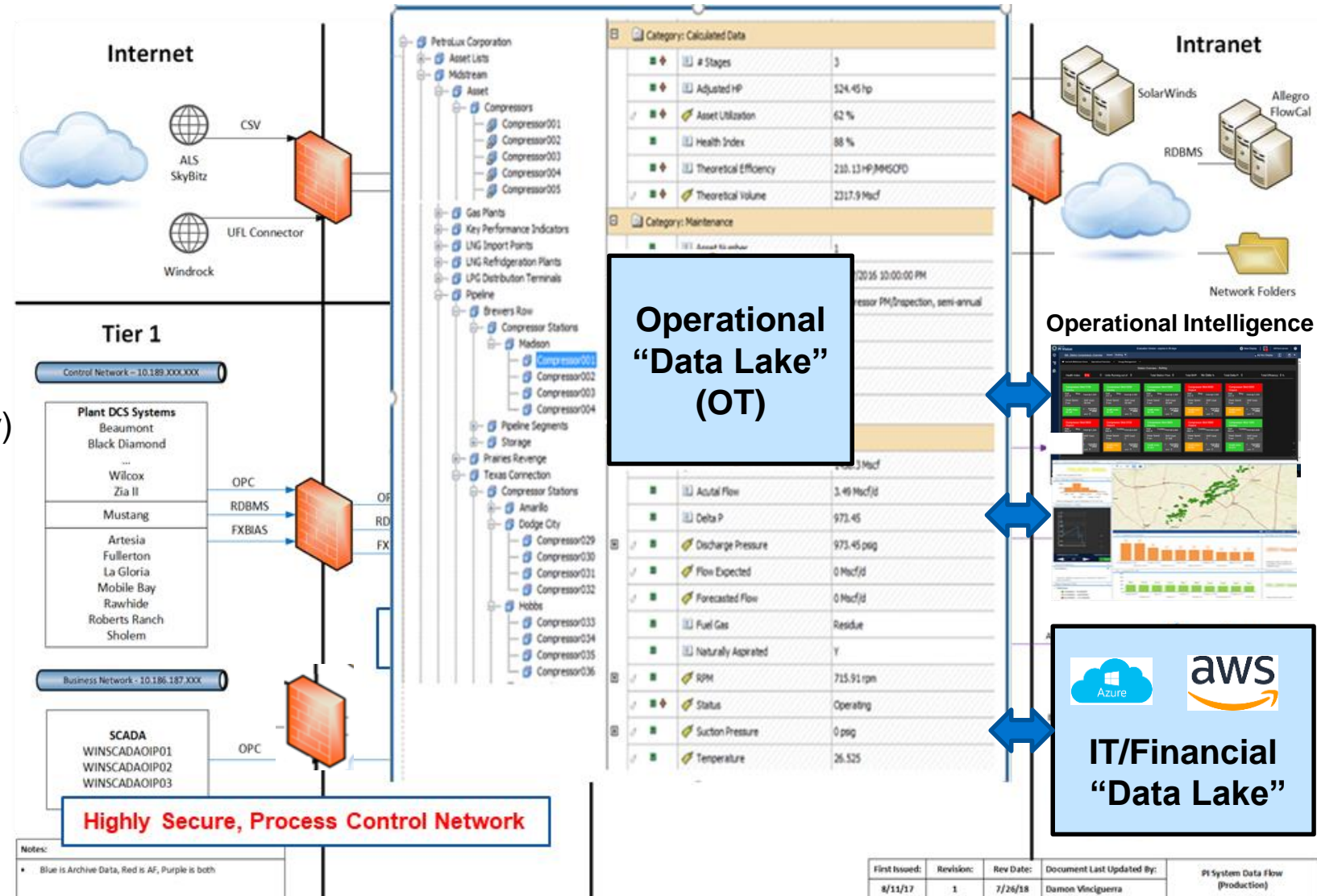
Mobile

IOT/Cloud

Meta Data

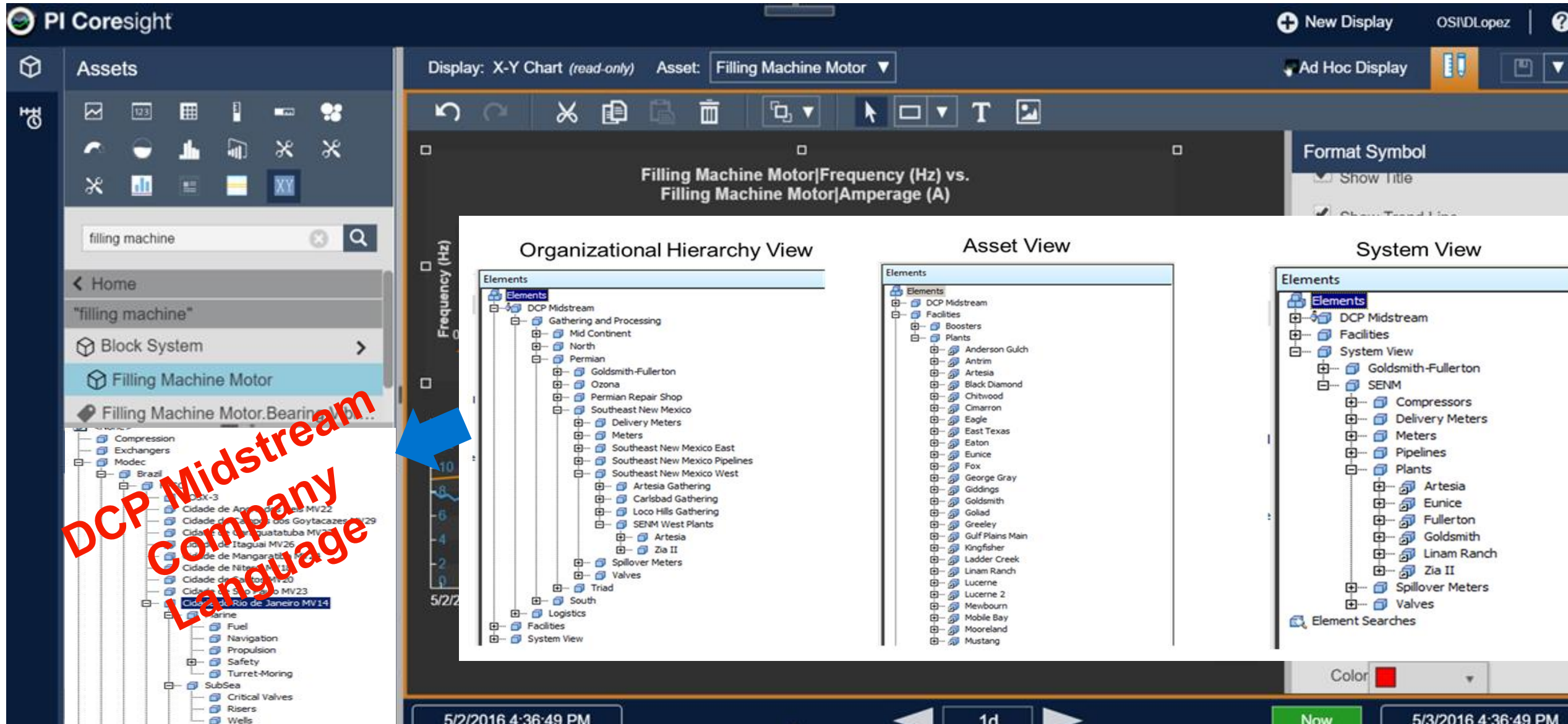
Example of an OT Data Integration Infrastructure

- **Plant DCS** (OPC, RDBMS, FXBAIS)
- **Wonderware SCADA** (OPC, RDBMS)
- **Allegro** – Market Prices (RDBMS)
- **Windrock Spotlight** (Connector for UFL)
- **VMGSim** (OPC – bidirectional data flow)
- **ACI Compression Modeling** (custom utility – bidirectional data flow)
- **Current local temperature** (custom utility)
- **FlowCal** - Volumes and GC (RDBMS)
- **SkyBitz** – remote tank monitoring (UFL)
- **ALS** – lab tests of oil samples (UFL)
- **SolarWinds** – network equipment status (Connector for UFL)
- **FieldSquared** – Operator rounds (custom utility and UFL)



Reference: DCP Midstream's PI World 2018 Presentation

Self Serve Operational Intelligence



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Opportunities in Gas Infrastructure

Scalability & Manageability with Digital Templates

Configured via Agile Method by the SMEs with Governance



Elements

- Templates: 408
- Instances: 11,898
- **29 times as many instances as templates**

Real-Time Analytics

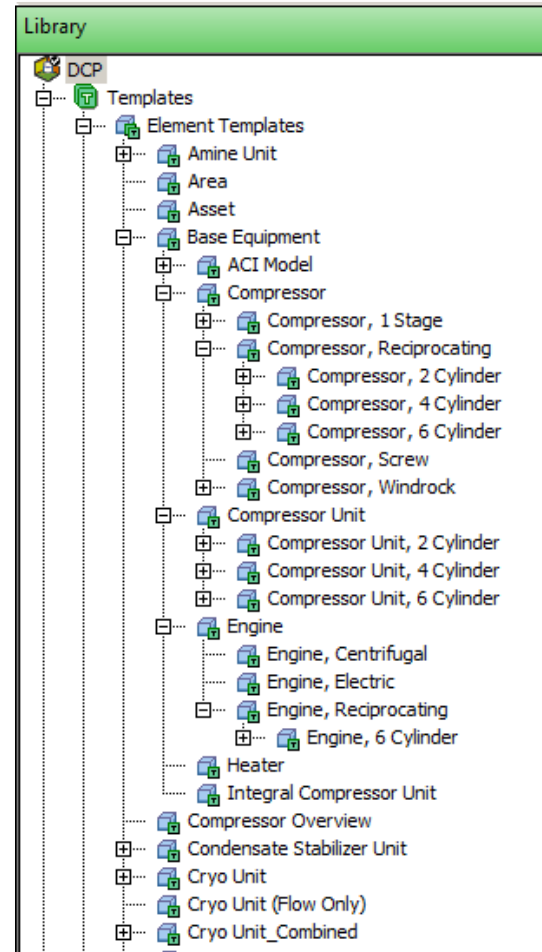
- Templates: 807
- Instances: 84,020
- **104 times as many instances as templates**

Notifications

- Templates: 109
- Instances: 42,336
- **388 times as many instances as templates**

Event Frames Generated

- **1,331,017**



| 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 | | |

Reference: DCP Midstream's OSIsoft Dallas Regional Seminar