

Special Award to TransCanada's Enterprise Analytics Team

For Support of OSIsoft and the O&G Industry Team





Dave Johnson
UC 2013 – San Fran & EMEA

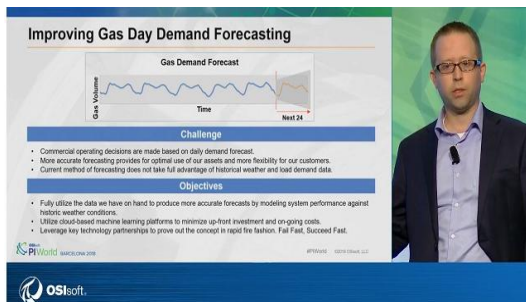
20+ UC/PI World Presentations San Francisco & EMEA 5+ Conferences



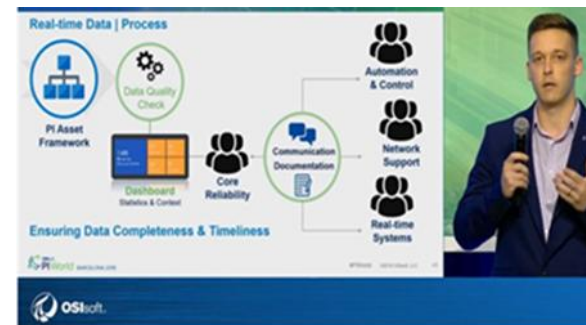
Keary Rogers (12+)



Emily Rawlings



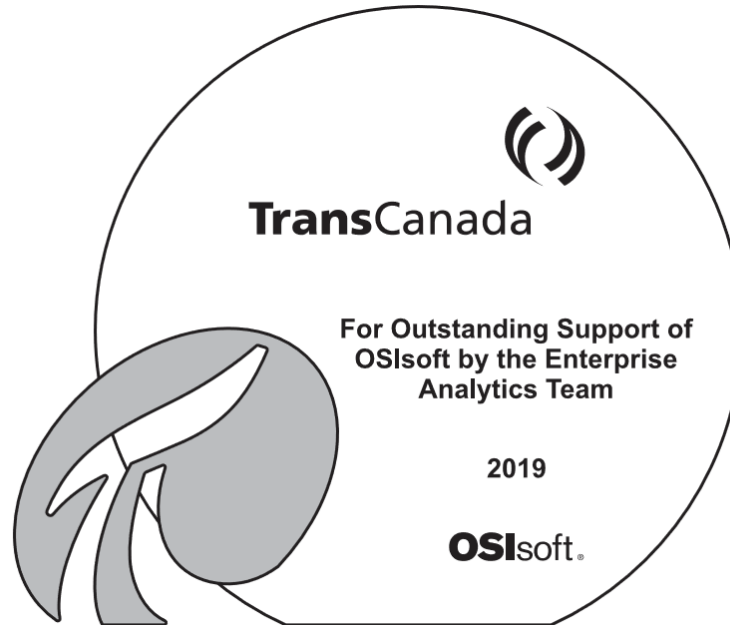
Brandon Bell & Josh Linville



Ionut Buse (10+)

Thank You

for Being Such a Fantastic Partner & Supporter of OSIsoft!



TransCanada OpsVision 20/20

Morgan Busse
Maria Sylte



Agenda

- About TransCanada
- Business & Technology Need
- Product Vision: Leveraging Existing Infrastructure
- Core Design & Technical Features
- OpsVision Overview & Product Roadmap
- Business Impact
- Conclusion

Forward-Looking Information and Non-GAAP Measures

This presentation includes certain forward looking information, including future oriented financial information or financial outlook, which is intended to help current and potential investors understand management's assessment of our future plans and financial outlook, and our future prospects overall. Statements that are forward-looking are based on certain assumptions and on what we know and expect today and generally include words like anticipate, expect, believe, may, will, should, estimate or other similar words.

Forward-looking statements do not guarantee future performance. Actual events and results could be significantly different because of assumptions, risks or uncertainties related to our business or events that happen after the date of this presentation. Our forward-looking information in this presentation includes statements related to: future dividend growth and the future growth of our core businesses.

Our forward looking information is based on certain key assumptions and is subject to risks and uncertainties, including but not limited to: our ability to successfully implement our strategic initiatives and whether they will yield the expected benefits, the operating performance of our pipeline and energy assets, economic and competitive conditions in North America and globally, the availability, demand for and price of energy commodities and changes in market commodity prices, the amount of capacity sold and rates achieved in our pipeline businesses, the amount of capacity payments and revenues we receive from our energy business, regulatory decisions and outcomes, outcomes of legal proceedings, including arbitration and insurance claims, performance and credit risk of our counterparties, changes in the political environment, changes in environmental and other laws and regulations, construction and completion of capital projects, labour, equipment and material costs, access to capital markets, interest, inflation, tax and foreign exchange rates, weather, cyber security and technological developments. You can read more about these risks and others in our November 8, 2017 Quarterly Report to Shareholders and 2016 Annual Report filed with Canadian securities regulators and the SEC and available at www.transcanada.com.

As actual results could vary significantly from the forward-looking information, you should not put undue reliance on forward-looking information and should not use future-oriented information or financial outlooks for anything other than their intended purpose. We do not update our forward-looking statements due to new information for future events, unless we are required to by law.

This presentation contains reference to certain financial measures (non-GAAP measures) that do not have any standardized meaning as prescribed by U.S. generally accepted accounting principles (GAAP) and therefore may not be comparable to similar measures presented by other entities. These non-GAAP measures may include Comparable Earnings, Comparable Earnings per Share, Comparable Earnings Before Interest, Taxes, Depreciation and Amortization (Comparable EBITDA), Funds Generated from Operations, Comparable Funds Generated from Operations, Comparable Distributable Cash Flow (DCF) and Comparable DCF per share. Reconciliations to the most closely related GAAP measures are included in this presentation and in our November 8, 2017 Quarterly Report to Shareholders filed with Canadian securities regulators and the SEC and available at www.transcanada.com.

TransCanada Corporation (TSX/NYSE: TRP)

One of North America's Largest Natural Gas Pipeline Networks

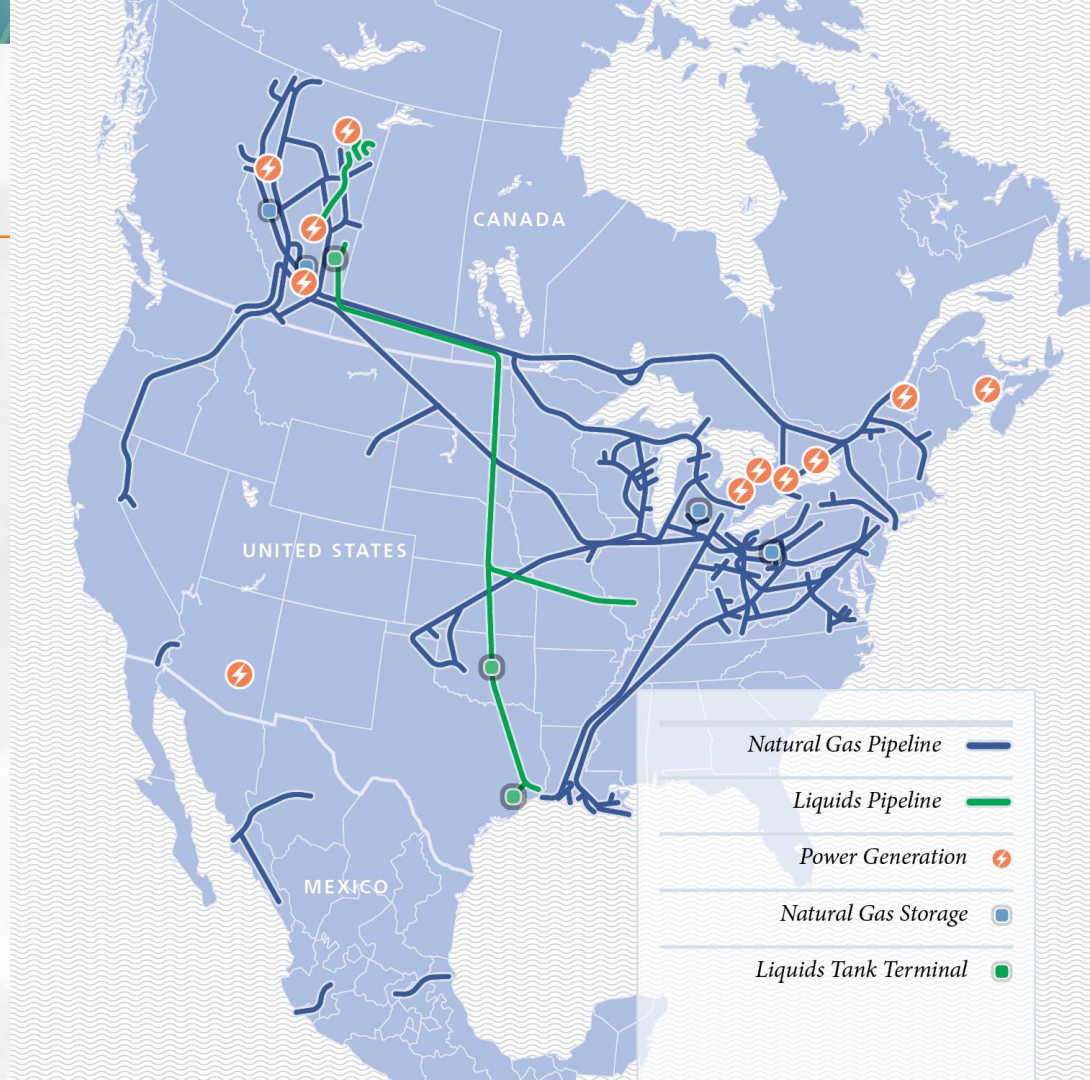
- Operate 91,900 km (57,100 mi.) of pipelines
- Transport ~25 per cent of continental demand
- Over 650 Bcf of gas storage capacity

One of Canada's Largest Private Sector Power Generators

- 11 power facilities, approximately 6,600 MW
- Low-emissions portfolio includes nuclear and natural gas generation

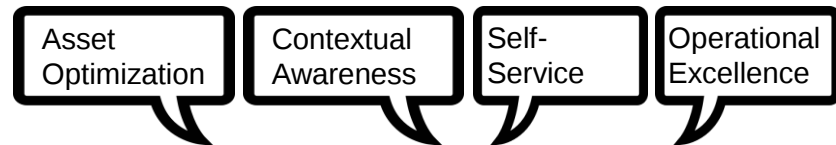
Premier Liquids Pipeline System

- 4,900 km (3,000 mi.) of pipelines
- Keystone System transports ~20 per cent of Western Canadian exports
- Safely delivered more than 2 billion barrels of Canadian oil to U.S. markets



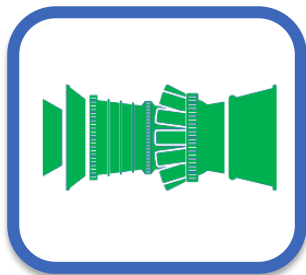
Business Need

Drive Operational Intelligence



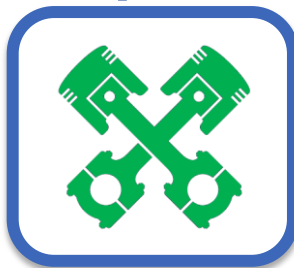
Technology Need: Exposing a Diverse Fleet

Turbines



50+ Makes/Models

Reciprocating



100+ Makes/Models

Electric



15 Makes/Models



Vintage

Target Features

Scalability



Ease of Implementation

Maintainability



Automated Upkeep

Usability



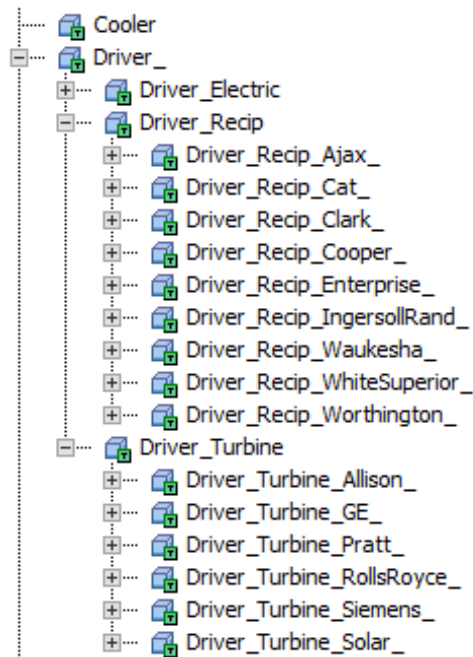
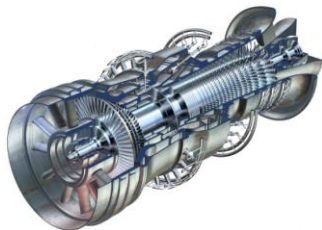
Intuitive

TransCanada Historical Use of PI

Equipment

Robust AF Design

Digital Twin



350+
Element Templates

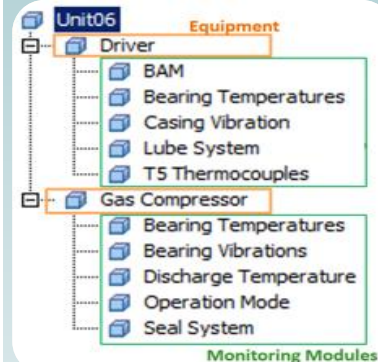
x30

11K+
Elements

560+
Analysis Templates

x70

40K+
Analyses

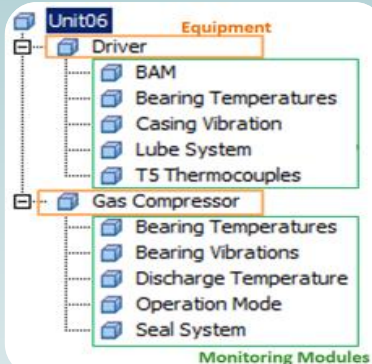
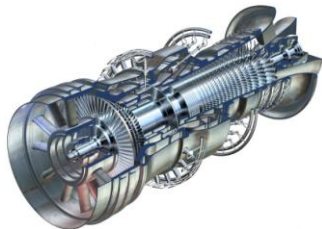


TransCanada Applications of PI Suite

Equipment

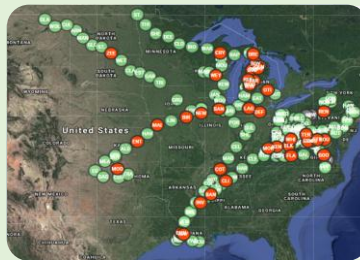
Digital Twin

Applications



Robust Asset Framework

Anomaly Detection

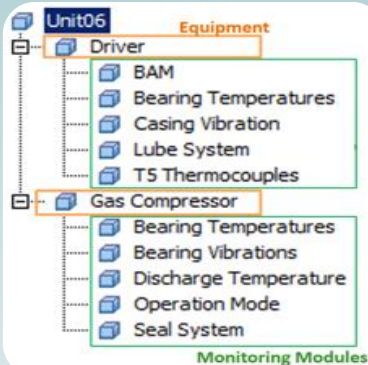
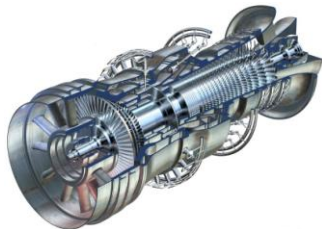


TransCanada Applications of PI Suite

Equipment

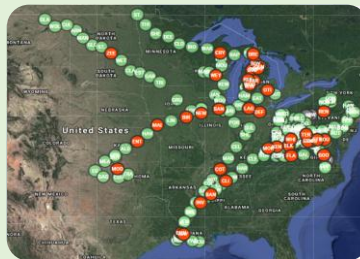
Digital Twin

Applications



Robust Asset Framework

Anomaly Detection



Ops Vision



PI Vision Introduction



Easy Click-and-Drag Construction



Supported Across Multiple Devices



No Special Software Requirements

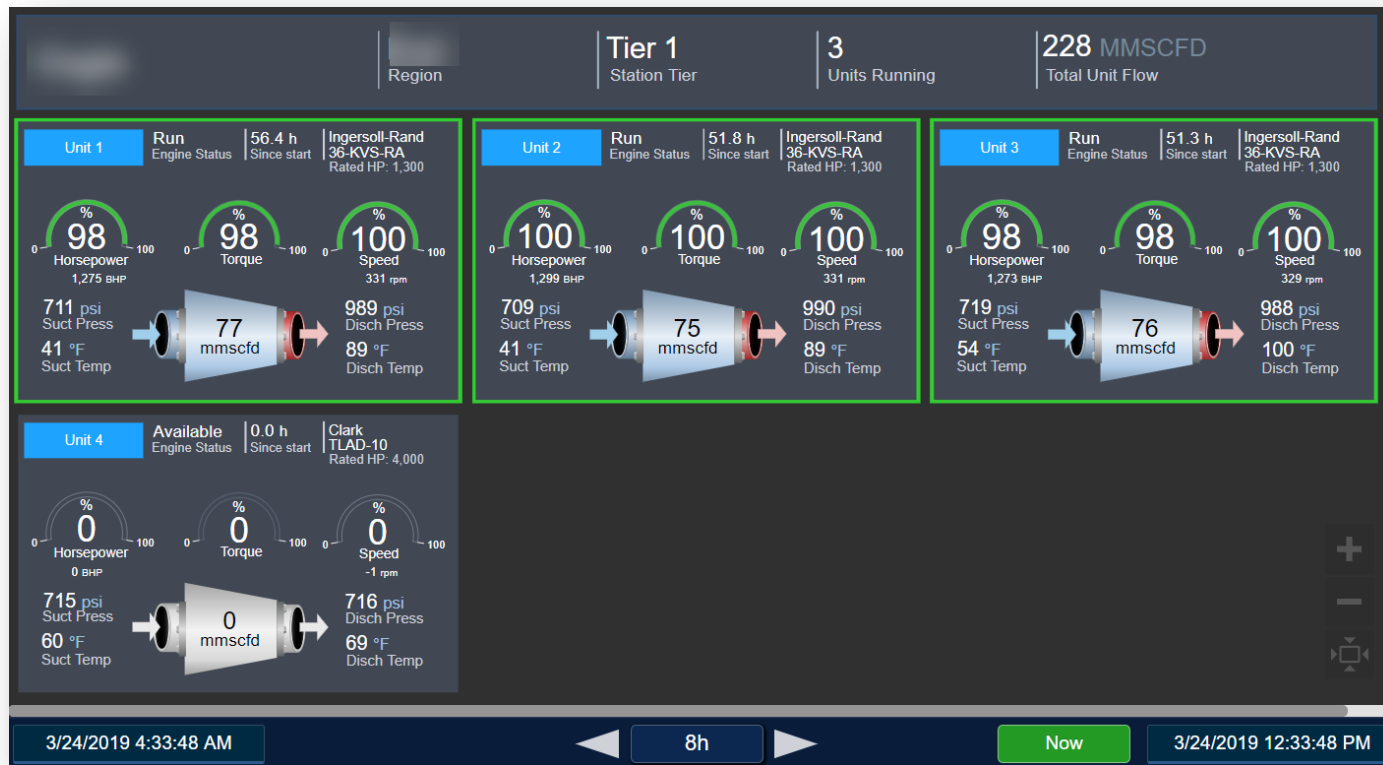
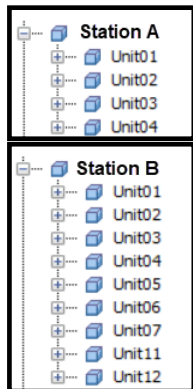


Extensibility Framework: Create Custom Symbols

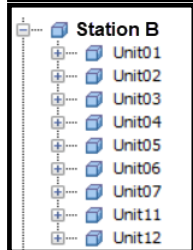
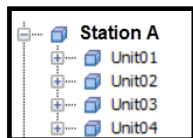


Collection Feature: Quick overview of all assets based on the same template

OpsVision 20/20



Collection Implementation



Edit Collection Criteria ▾

► Database EA

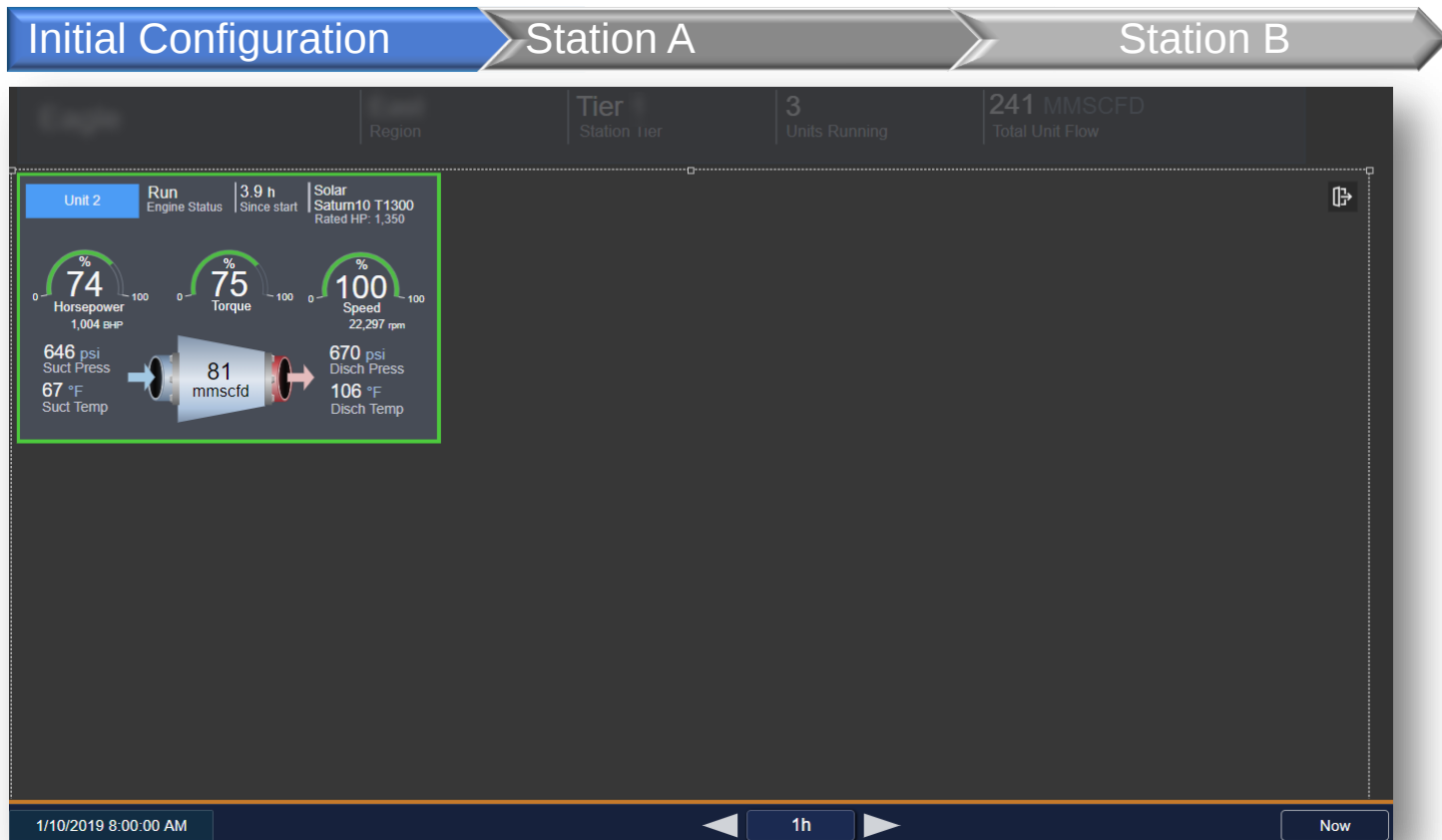
► Search Root TC\Compression\StationA

► Asset Name

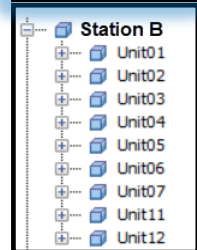
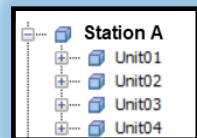
▼ Asset Type Selected

Asset Type

CompressionUnit ▾



Collection Implementation



Edit Collection Criteria ▼

► Database EA

► Search Root TC\Compression\StationA

► Asset Name

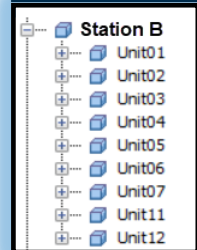
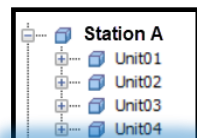
▼ Asset Type Selected

Asset Type

CompressionUnit ▼



Collection Implementation



Edit Collection Criteria

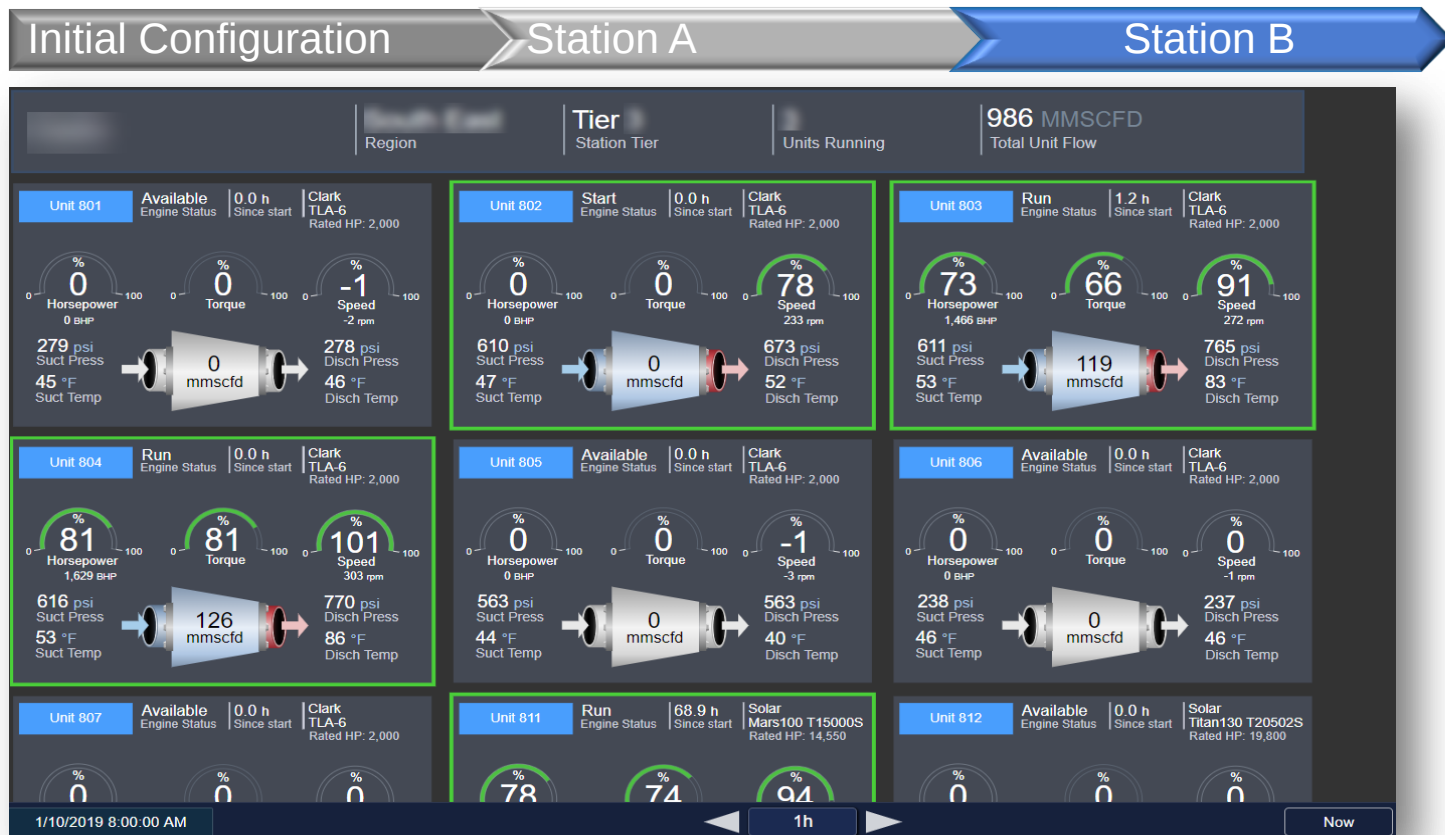
Database: EA

Search Root: TC\Compression\StationA

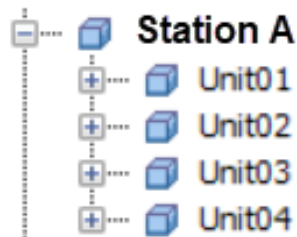
Asset Name:

Asset Type: Selected

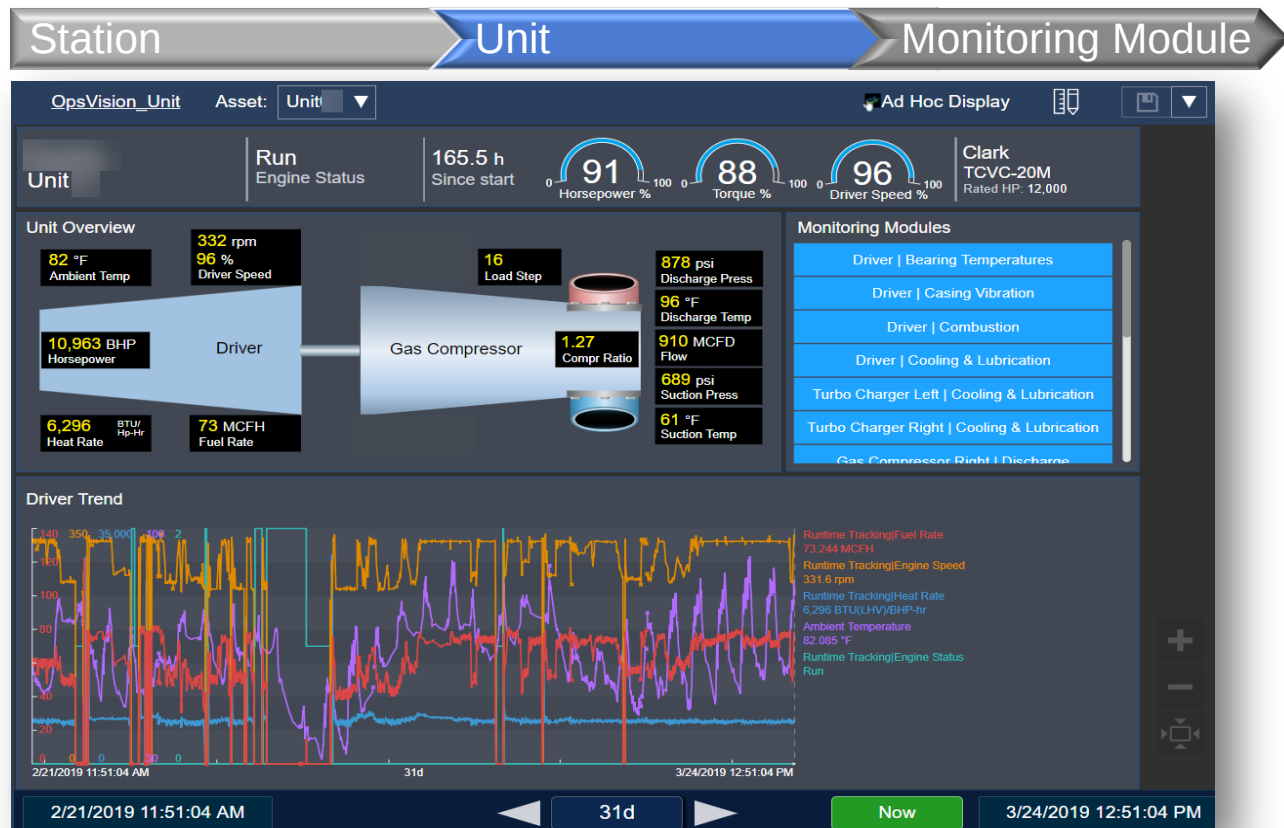
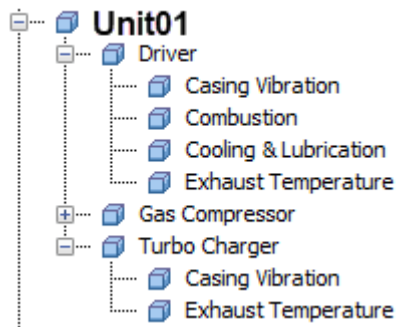
Asset Type: CompressionUnit



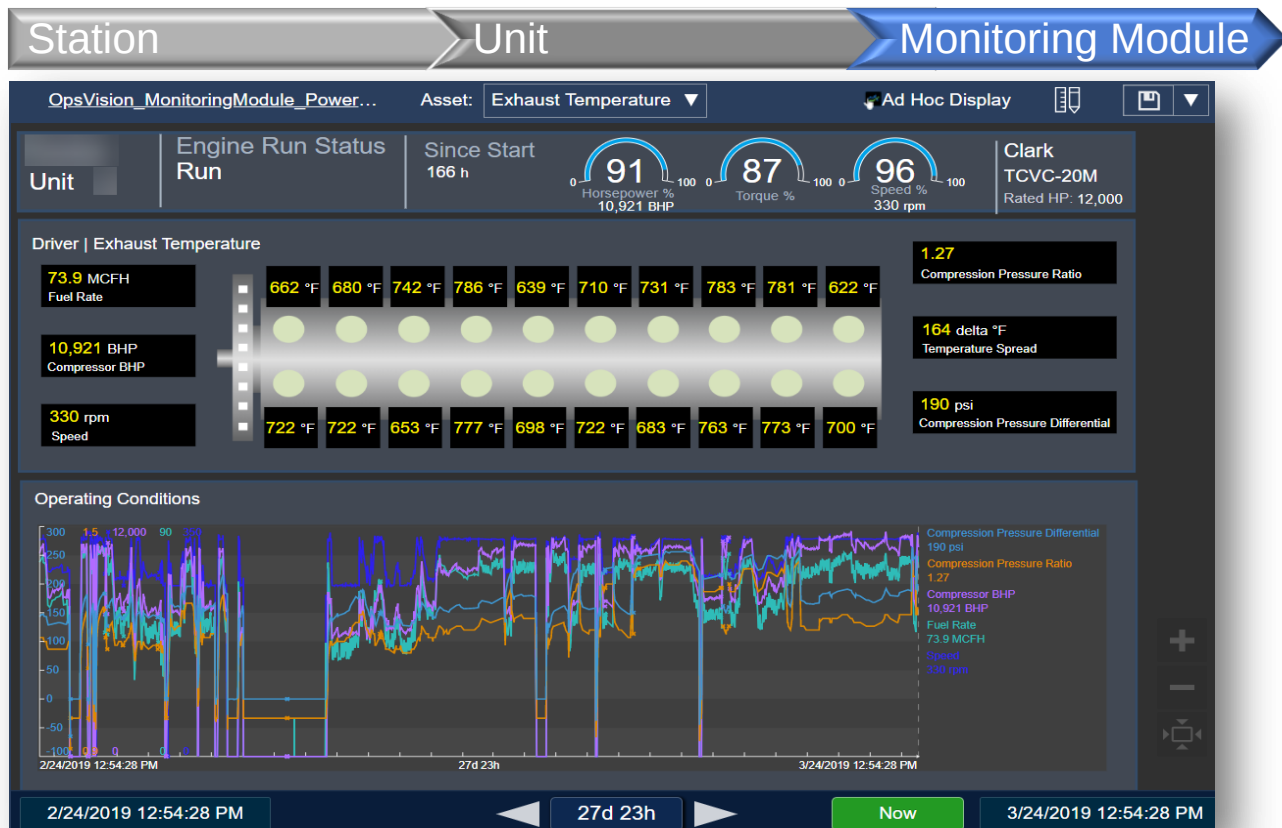
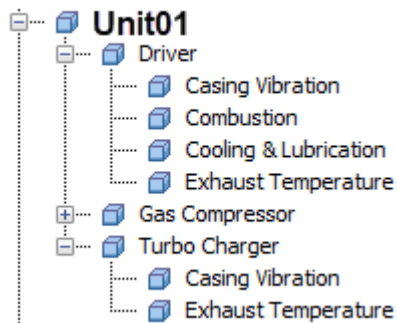
OpsVision Core Design



OpsVision Core Design



OpsVision Core Design

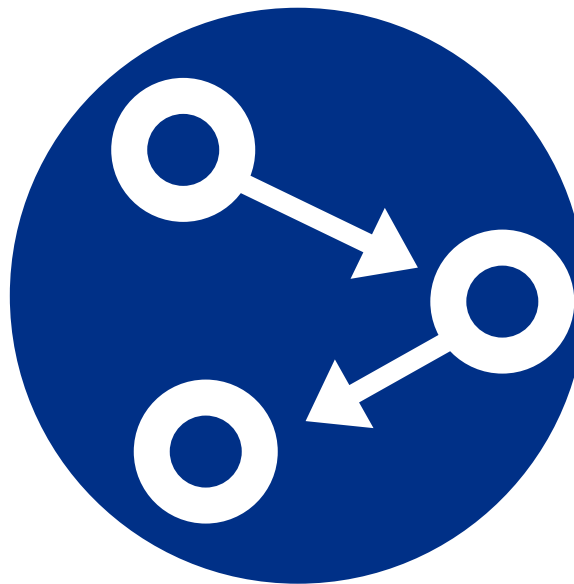
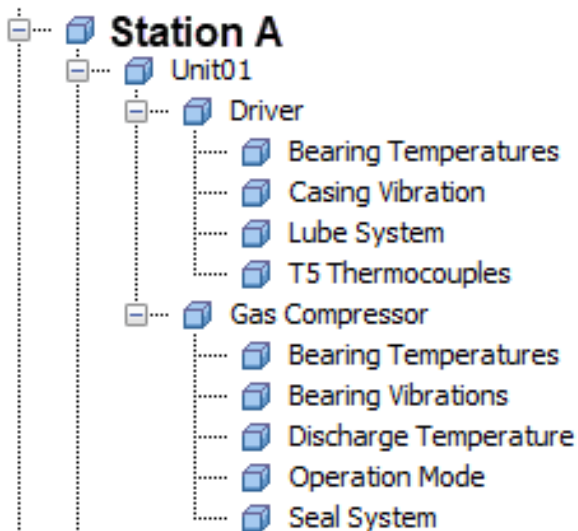


OpsVision Core Design

Station

Unit

Monitoring Module



Navigation?

Navigation Framework

Dynamic Hyperlink



Custom Symbol: Extensibility Framework

Driver | Cooling & Lubrication

Dynamically generate Label and URL
based on AF Attributes

Collections



Group Assets by Category

Monitoring Modules

Driver | Casing Vibration

Driver | Combustion

Driver | Cooling & Lubrication

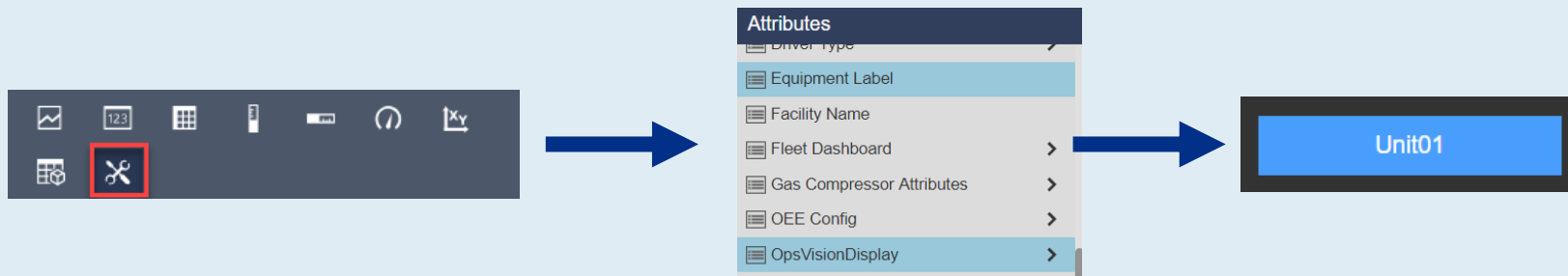
Gas Compressor | Discharge Temperature

Dynamic Hyperlink

Step 1: Create Reference Attributes in PI Asset Framework

	Equipment Label	Unit01
	Facility Name	Adaline
	Fleet Dashboard	
	Gas Compressor Attributes	0
	OEE Config	
	OpsVisionDisplay	#/Displays/609/OpsVision_Unit?Asset=\\PT2...

Step 2: Select “Dynamic Hyperlink” Icon in PI Vision, Select Reference Attributes, and Create Button



Leverage the “Collections” Feature

Step 1: Convert Dynamic Hyperlink to Collection

Driver | Cooling & Lubrication

Configuration Info...
Add Navigation Link...
Convert to Collection...
Switch Symbol to ▶

Step 2: Customize Collection Criteria

Edit Collection Criteria ▼

Database	EA
Search Root	TC\Compression\Adaline\Unit01
Asset Name	
Asset Type	
Asset Category	MonitoringModule

Result:

Monitoring Modules

Driver | Casing Vibration

Driver | Combustion

Driver | Cooling & Lubrication

Gas Compressor | Discharge Temperature

Driver | Exhaust Temperature

Driver | Manifold

Gas Compressor | Oil Consumption

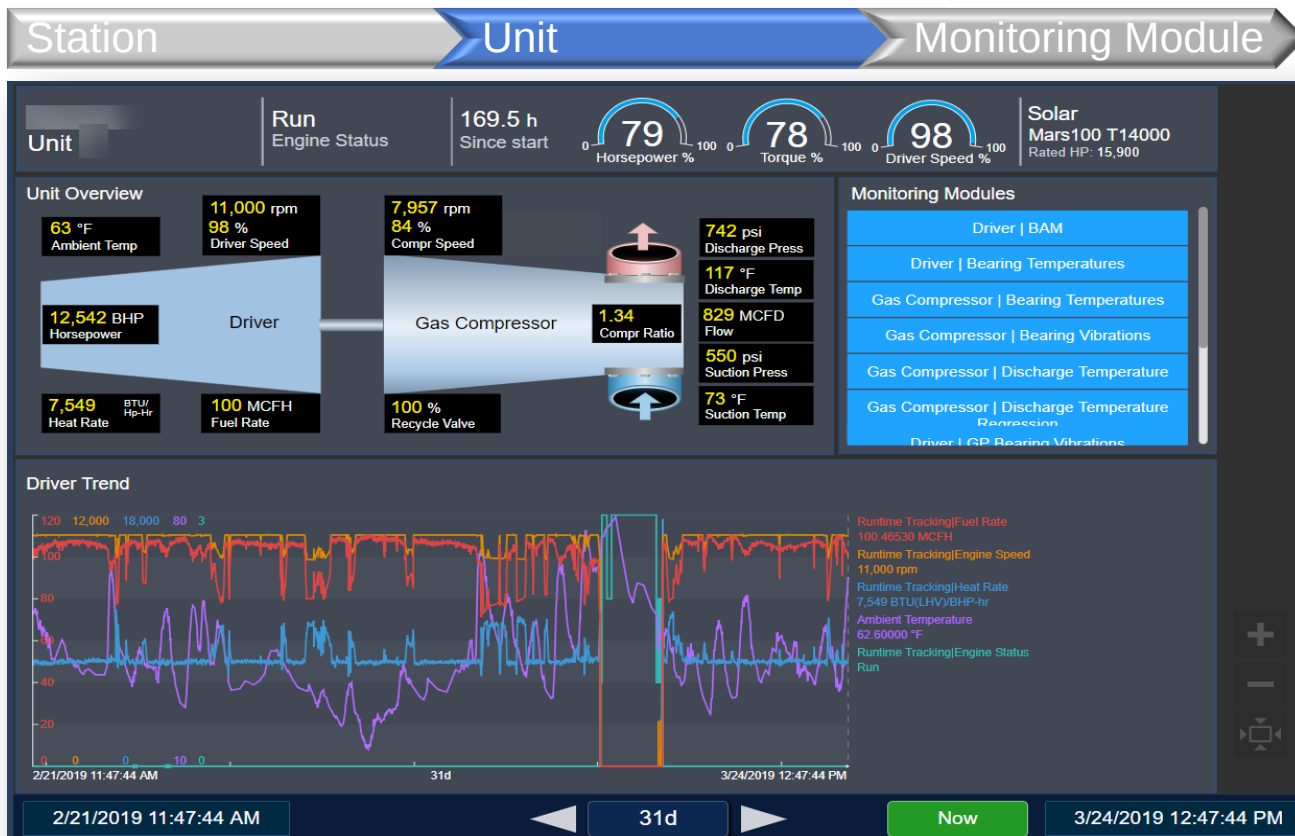


OpsVision | Facility Overview

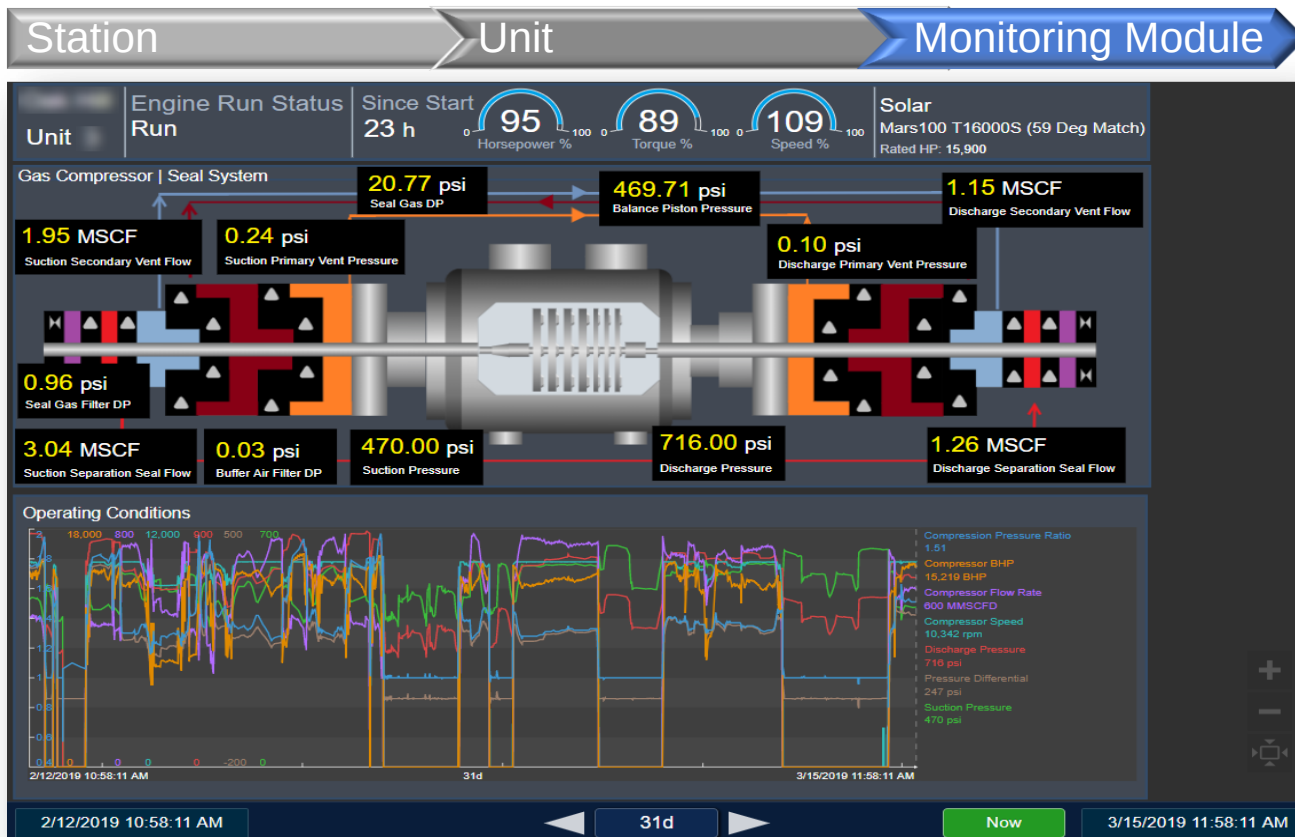


Change Station / Context Through Drop-Down

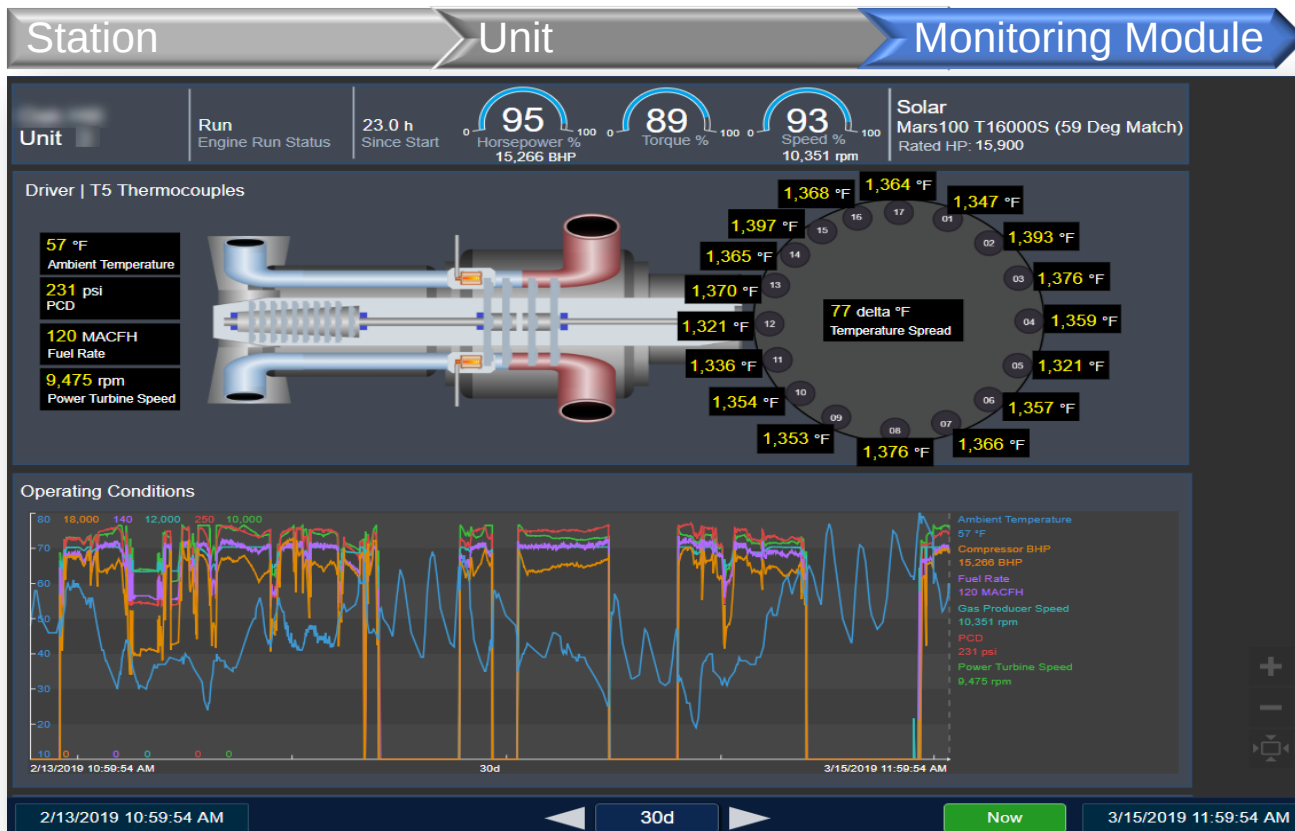
OpsVision | Unit Overview



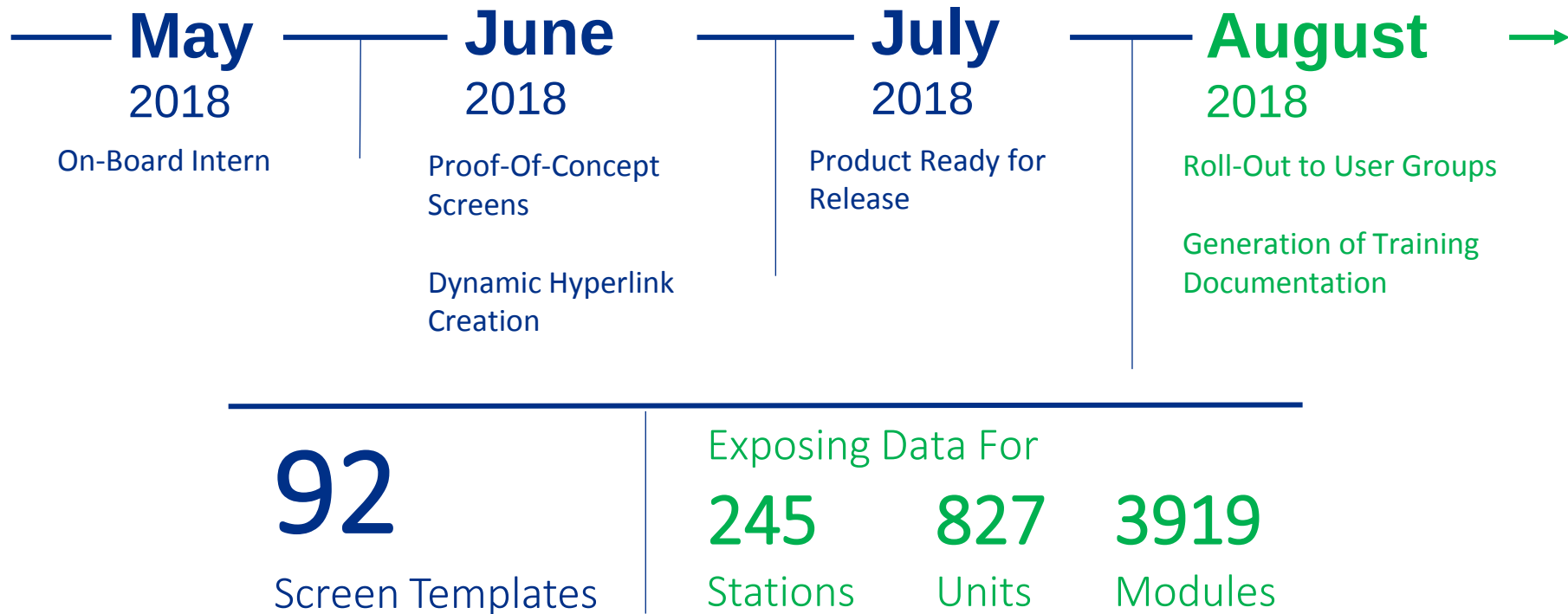
OpsVision | Monitoring Module | Seal System



OpsVision | Monitoring Module | T5 Thermocouples



Product Roadmap



Business Impact: End User Feedback



TransCanada OpsVision 20/20

Self-Served Contextualized Operational Intelligence



CHALLENGE

How can we expose our digital assets to the larger organization?

Focus on Achieving:

- Scalability
- Maintainability
- Usability

SOLUTION

Leverage digital infrastructure, templates, and one custom symbol to build a scalable product

- Platform Used: PI Vision
- Construction Time: 3 Months
- Resources: 1 Intern Resource

RESULTS

Created a high utility tool to expose operational data to users across the organization

- Minimal Ongoing Maintenance
- Overwhelming positive feedback from users

Presenters



- Maria Sylte
- Reliability Engineer
- TransCanada
- Maria_Sylte@transcanada.com



- Morgan Busse
- Reliability Engineer
- TransCanada
- Morgan_Busse@transcanada.com

Questions?

Please wait for
the **microphone**

State your
name & company



Please remember

TO DOWNLOAD
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