OSIsoft Super Regional

Transform Your World

August 21, 2018

The Best of PIWorld 2018

Sue Quense, VP Sales , North America
August 21, 2018

2156 REGISTERED ATTENDEES

160 CUSTOMER PRESENTATIONS

NINE INDUSTRY TRACKS

58 PARTNER BOOTHS

THE SOCIAL SIDE

DIVERSITY & INCLUSION
co-sponsored with SAP

INNOVATION HACKATHON

PARTNER EXPO

INDUSTRY TRACK EXPERT PICKS

Oil & Gas
DCP MIDSTREAM
Saved over $20 million in the
first year with improved reliability ▶

Power Generation
AGL
Over $18 million in savings
in less than a year ▶

T&D
DUKE ENERGY
Saved 200+ hours of labor per
month with advanced analytics ▶

Water
TASWATER
ML for predicting sewer spills
cut detection by 13 hours ▶

Pulp & Paper
INTERNATIONAL PAPER
Reduced extraction time
by over 80% ▶

Mining, Metals & Materials
GOLDCORP
Additional 4% recovery
of zinc in 6 months ▶

Life Sciences
BIOGEN
Enabling community with
data sharing of events ▶

Transportation
TRAPAC
Over 60% improvement on
maintenance compliance ▶

Facilities
UNIVERSITY OF MARYLAND
Electrical outage response
reduced from 90 min. to zero ▶

TOP ANALYTICS PICKS

Machine Learning
AIR LIQUIDE
Achieved ROI
in 3 Months ▶

Industrial Analytics
NERGICA
De-icing Canada's
wind turbines with data ▶

Data Science
LEHIGH UNIVERSITY
Intro to Data Science with
the PI System ▶

TAS WATER

Enhancing Times Series Data to Prevent Sewer Spills

204,949
NUMBER OF
WATER CONNECTIONS

70
DRINKING WATER SYSTEMS

6,266 km
WATER MAINS

295
WATER DISTRIBUTION
STORAGE FACILITIES

970
WATER AND SEWAGE
PUMP STATIONS

180,000
NUMBER OF
SEWERAGE CONNECTIONS

4,745 km
SEWER MAINS

34
SEWAGE TREATMENT PLANTS
LEVEL 1

79
SEWAGE TREATMENT PLANTS
LEVEL 2

877
EMPLOYEES & CONTRACTORS

Using Data Science to predict blockages

Blockage occurred 24 August 2017, spilling approximately 6,000 L into Pittwater

Problem: When a sewer main blocks and ultimately spills, the first notification TasWater has is from a member of the public hours and sometimes days after it first spills.

Question: What processes and monitoring techniques could we implement to detect sewer main failures as soon as practicable after the blockage has occurred, minimising the impact or preventing a spill occurring.

DCP MIDSTREAM

- One of the largest U.S. natural gas processing companies
- One of the largest U.S. producers of NGLs
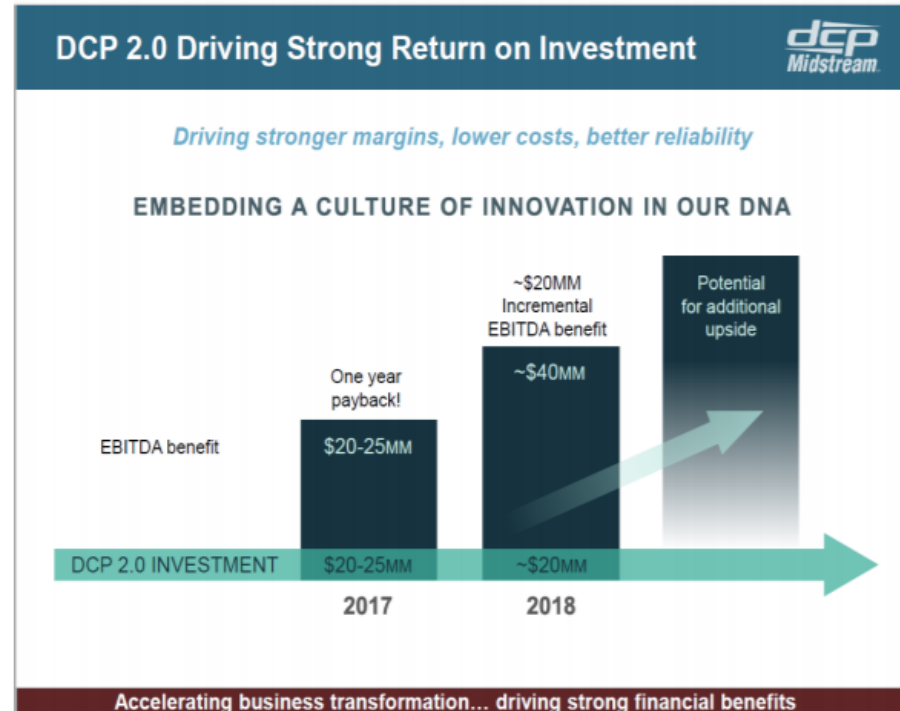- One of the largest NGL pipeline operators

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

The Journey Begins- PI System and DCP's Digital Transformation

Delivering Disruptive and 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 Driving Strong Return on Investment

Driving stronger margins, lower costs, better reliability

EMBEDDING A CULTURE OF INNOVATION IN OUR DNA

~$20MM Incremental EBITDA benefit

Potential for additional upside

One year payback!

EBITDA benefit

$20-25MM

~$40MM

DCP 2.0 INVESTMENT | $20-25MM | ~$20MM

2017 | 2018

Accelerating business transformation… driving strong financial benefits

DUKE ENERGY RENEWABLES

- 150+ years of service
- 7.5 million electric customer
- 1.5 million retail gas customers
- Duke Energy began investing in commercial renewable assets in **2009**
  - Favorable market environment led to additional investments
- **Today**
  - **~ 2,500 MW of wind**
  - **~ 600 MW of solar**
  - **~ 1,400 MW of operated wind and solar**
  - Enough to power ½ **million** homes
  - **$5 billion** in assets
  - Presence in **AZ, CA, CO, FL, KS, NC, NM, NY, OK, PA, TX, WI, WY**

Asset Analytics in a Renewable World

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The Impact

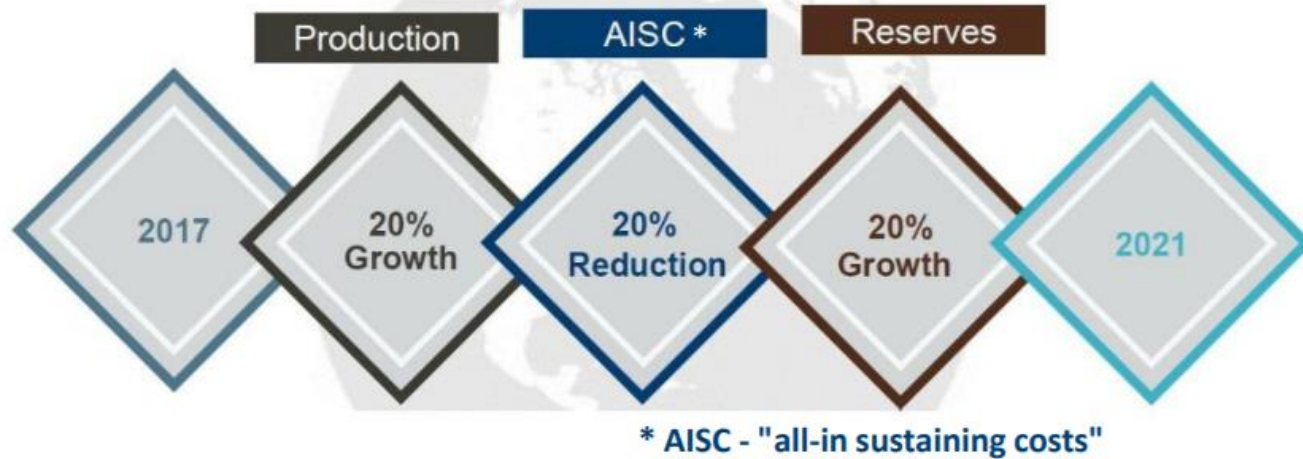- A single, secure data repository for the entire business unit to use

- Reduction in resource requirements on a monthly basis

- Automation of the reporting process

GOLDCORP

Real Time Data Critical to Mining

| Production | AISC * | Reserves |

2017 — 20% Growth — 20% Reduction — 20% Growth — 2021

* AISC - "all-in sustaining costs"

In 2016, the Company outlined its 20/20/20 growth plan that is expected to deliver a 20% increase in gold production, a 20% increase in gold reserves and a 20% reduction in AISC by 2021.

Identifying Opportunities for Improvement

During 2017 OSIsoft and Goldcorp executed a Business Impact Workshop at Peñasquito site, where its main objective was:

- Gather different operations areas and **Identify business value opportunities**
- **Define initiatives** associated to the business opportunities.
- All the above activities executed by **leveraging OSIsoft services**.
- Deliver value in **less than 1 year**.

WATER MANAGEMENT   ENVIRONMENTAL & HEALTH   ENERGY MANAGEMENT   MINE TO PLANT INTEGRATION   METAL RECOVERY

Simulation and Visualization Drive Improved Production

Challenge

- Significant variations in ore blend
- Fixed recovery target
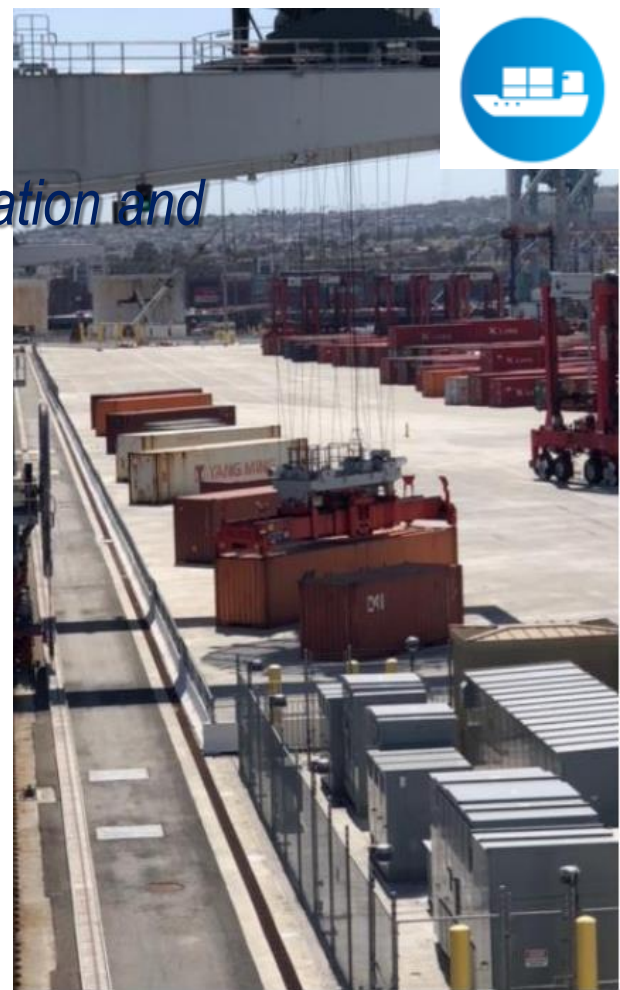- Limited operator view into feedstock composition

Results

- A Dynamic Simulator provides real-time targets based on feed grades and other on-stream measurements
- Use of PI real-time data for decision making has changed the philosophy and operating culture within the control room.
- The equivalent of 4 to 5 days of additional production has been achieved since the simulator was implemented.

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TraPac

TraPac drives operational results through automation and digitalization at Port of Los Angeles

- Container terminal operator and vessel stevedore that provides port terminal services to the West Coast of USA

- Port of Los Angeles is flagship operation

- Leading edge in container-terminal automation in North America

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Goals and Challenges

Goals

- Improved operational efficiency
- Accelerated issue resolution
- Improved preventative maintenance program

Challenges

- Complex automation solution that involves multiple systems from different vendors
- Inadequate data-acquisition tools for in-depth analysis of existing KPIs

Improve Operational and Maintenance Performance

- Improved operational efficiency
  - RMG Cycle Time decreased by more than 10 %
- Accelerated issue resolution
  - Significantly faster. Flipper issue resolved within a shift.
- Improved Preventative Maintenance Program
  - Increased Maintenance Compliance: 100% on target

Biogen

Using the System Connector to Build a Strong Security Posture

Challenge

- Today's control systems are increasingly networked, internal customers need access to more and more data

Networking makes data more available but at the same time those systems become more vulnerable to security threats
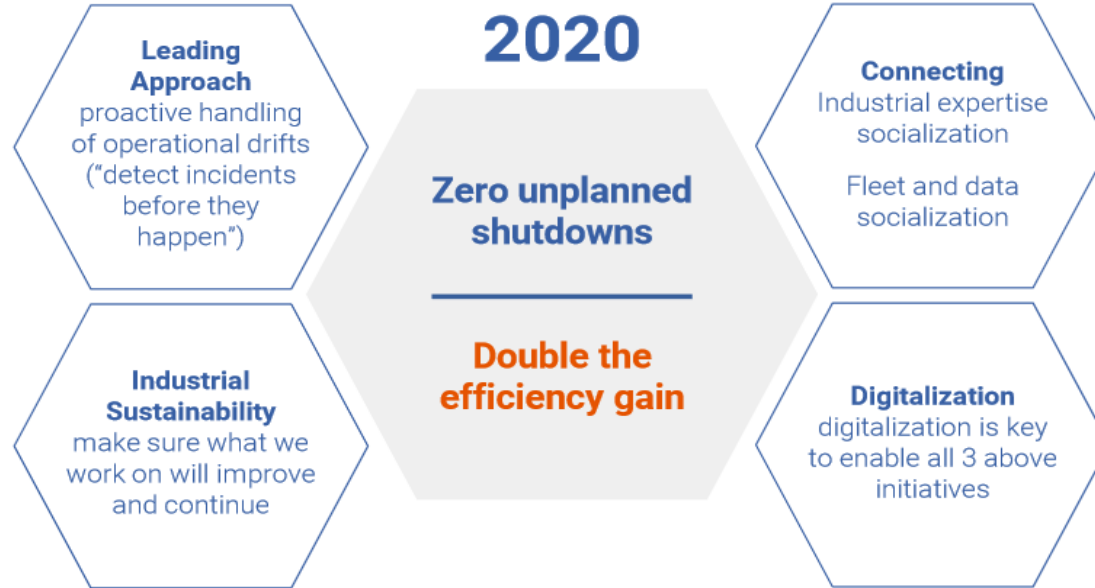
Intellectual property and confidential data often reside on PI - how do we reduce vulnerability?

AIR LIQUIDE

Air Liquide Large Industries business challenge

2020

Zero unplanned shutdowns

Double the efficiency gain

Leading Approach
proactive handling of operational drifts ("detect incidents before they happen")

Industrial Sustainability
make sure what we work on will improve and continue

Connecting
Industrial expertise socialization

Fleet and data socialization

Digitalization
digitalization is key to enable all 3 above initiatives

SIO.Perform Stream@Air Liquide How OSIsoft PI with analytics improve ROI

Results

- Every Hydrogen plant in Europe, Middle East and Asia-Pacific equipped with SIO.Perform solution

- Project payback in 3 months

- Saving 10 times the project cost after 8 months

- Benefits in terms of human resources, visibility, Air Liquide's customers, image…

Takeaways

- Incorporating Advanced Analytics and Machine Learning can deliver real benefits today
- Architecting for Security is important and achievable
- Think about expanding your use of PI to the discrete parts of your operations
- Giving people visibility into the process engages them in improving it
- Organizing and contextualizing your data saves time and money
- Rapid payback is achievable with properly scoped, resourced and executed projects
- Working with partners and system integrators can accelerate your projects

- NEVER NEVER NEVER pour bacon grease down the drain!

Thank You

Sue Quense VP Sales North America
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