Energy Process Utilities
3DEXPERIENCE FORUM
San Francisco
19th November 2015

Stephane Declee
VP Energy, Process & Utilities Industry
Who do we serve

9.1 Power
- Nuclear
- Thermal
- Hydro
- Wind
- Solar
- Biomass

9.2 Process
- Metals (Steel, Alu, Copper)
- Minerals (Cement, Glass)
- Pulp & Paper
- Water & waste treatment

9.3 Chemical
- Basic chemicals
- Polymers
- Specialty chemicals
- Industrial Gases
- Fertilizers

9.4 Utilities
- Electric Transmission & Distribution
- Water distribution
- Waste collection

9.5 Oil & Gas Downstream
- Oil & Gas Refining
- Petrochemicals
- Oil & Gas Transportation & Storage
What my industry values the most

SAFETY

PROFITABILITY

RELIABILITY

QUALITY

COMPLIANCE

SUSTAINABILITY
Industry Trends: Digitalization Acceleration

- Digital Capital Project
- Digital Social Knowledge
- Digital Operation
- Consumer Driven Optimization
- Digital Research
- IoT, Smart Metering, Bigdata
3DEXPERIENCE Platform | Virtual Twin Lifecycle

Plan it for Consumers
Specify It for Safety
Design It for Compliancy
Build It On Time
Operate It for Efficiency
Decommission It for Environment
Test It for Safety

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3DEXPERIENCE Platform | Virtual Twin Lifecycle

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Test It for Safety
Solution Experiences | Process & Chemical

Safe Plant Operation & Maintenance
Operate it for Efficiency & Safety

Optimized Plant Construction
Deliver it on time & on budget

Safe Plant Engineering
Engineer it for "No defect"

Sustainable Product
Maximum Discovery & Yield

Safe Plant Decommissioning
For Safety & less environmental impact

Customer Driven Supply
Plan it & Optimize it based on Demand

Winning Tender
When to bid, bid to win
Sustainable Product Experience

From Lab Innovation to Production for maximized yield

Sustainable Production

Sustainable Lab
Share science intelligence between multidisciplinary team

Sustainable Discovery
Discover & validate novel chemicals & materials

Licensed for Green
Sustainable Product Value Measurement

1. Collaboration boosts innovation productivity
2. Improved management of resources reduces usage
3. Speed processes & get to market faster
4. Reduced documentation time with electronic data capture & auditing
5. Centralize & reuse experiment data
6. Elimination of « dark data » (1)

(1) Dark data – Gartner – experimental and testing data with limited or no re-use, searchability, or leverage for enterprise problem solving.
### R&D: From Material Science to Lab Collaboration

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
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| **Chevron Phillips Petrochemicals** | - Sustainable Lab  
- End to end Chemical Inventory Management                                      |
| **ExxonMobil**                  | - Sustainable Lab  
- Complex data aggregation for new catalyst collaborative development       |
| **3M**                          | - Sustainable Lab  
- Scientific Innovation Lifecycle Management for 7500+ researchers           |
| **Leading North America EPC**   | - Sustainable Discovery  
- Molecular Modeling & Simulation  
- Scientific data aggregation                                                 |
| **Schlumberger**                |                                                                           |
What does Quintiq do?

Solve business operations planning puzzles

Supply Chain Planning & Optimization

KPI-based planning

Manufacturing
Planning & Scheduling

Logistics
Routing & Dispatching

Workforce
Scheduling

Resources
Production
Logistics
Customer Driven Supply Experience

Operational Delivery Planning
- Master Production Scheduling
- Detailed scheduling

Demand Driven Supply Planning
- Scenario Driven Optimization
- Sales & Operation Planning
- Inventory Management

Demand Driven Strategic Planning
- Scenario Driven Optimization
- Investment & Capacity Planning
- Annual Delivery / Budget Planning

Distribution Planning
- Truck Planning & Scheduling
- Vessel Planning & Scheduling
- Pipeline Planning & Scheduling
CAPEX: Capital Projects Transformations
On Quality, On Time, On Budget with improved Margin

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<thead>
<tr>
<th>AS-IS</th>
<th>TO-BE</th>
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<tbody>
<tr>
<td>“E” “P” “C”</td>
<td>“EPC Collaboration”</td>
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<tr>
<td>“EPC” then “O&amp;M”</td>
<td>“Owner Experience EPC”</td>
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<tr>
<td>“Documents”</td>
<td>“Data &amp; full digital mock-up”</td>
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<td>“Manual report”</td>
<td>“Live Dash boarding”</td>
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<td>“2D Planning”</td>
<td>“Multi Dimensional Planning”</td>
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<td>“Project by project”</td>
<td>“Project portfolio”</td>
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<td>“One Off”</td>
<td>“Knowledge &amp; Reuse”</td>
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CAPEX: Capital Project Management References

**NIAEP**
- Optimized Plant Construction
- Integrated Plant Engineering

**CAIRN India**
- Optimized Plant Construction

**CNNC/ CZEC**
- Integrated Plant Engineering
- Optimized Plant Construction

**Leading North America EPC**
- Optimized Plant Construction
Efficient Plant Operation
Operate & Maintain it for Efficiency, Safety & Compliancy

3DEXPERIENCE platform
Asset Virtual Twin

Consistency & Traceability

Optimized Asset Production

Optimized Maintenance Planning

Efficient and Safe Workforce

Enterprise Resource Planning
Enterprise Asset Management
Maintenance Execution System
Electronic Document Management System

Operational Asset Data Business Systems
# OPEX: Digital Asset in Operation References

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<thead>
<tr>
<th>HMEL</th>
<th>AkzoNobel</th>
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<td>• Safe Plant Operation &amp; Maintenance</td>
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