Nutrien & KBR: Leveraging SME Expertise with AVEVA UOC

Using AVEVA Unified Operations Center with AVEVA PI Server data across 13 sites

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Nutrien improve troubleshooting, monitoring and optimization across Nitrogen Facilities

**Challenge**
- Improve in troubleshooting, monitoring, and optimisation across Nitrogen facilities.
- Enhance collaboration for operational effectiveness.
- Cover occasional skills gaps across organization

**Solution**
- Established Nitrogen Real-time Operations Center (NROC) for real-time monitoring and optimisation.
- Integrated a robust technology platform including on AVEVA PI and AVEVA UOC

**Results**
- Streamlined operational processes, reducing downtime and increasing production capability.
- Enhanced equipment monitoring for early failure detection and fast troubleshooting.
- Positioned for continuous growth, adaptation, and operational optimisation through NROC.
2,000 RETAIL LOCATIONS
25,000 EMPLOYEES
20 PRODUCTION FACILITIES
$30B SALES
KBR Overview

With a full portfolio of services, proprietary technologies and expertise, we handle projects and missions throughout their entire lifecycle, from planning and design to sustainability and maintenance.

KBR works closely with GOVERNMENT and INDUSTRY CLIENTS to deliver science, technology and engineering solutions to governments and companies around the world.

- 32,000+ EMPLOYEES
- 80+ COUNTRIES
- INDUSTRY-LEADING SAFETY RECORD
- REVENUE $6.6B FULL YEAR 2022
In the process industry, with seasoned professionals transitioning and legacy assets in place, how can we effectively capture and amplify invaluable experience?
Vision | Nitrogen Real-time Operations Center (NROC) Overview

**10 Geographic Locations**
- Augusta
- Fort Saskatchewan
- Joffre
- Lima
- Trinidad
- Borger
- Geismar
- Kennewick
- Red Water
- Carseland

**13 Ammonia Plants**
- Augusta
- Borger
- Carseland
- Geismar
- Fort Saskatchewan
- Joffre
- Kennewick
- Lima
- Red Water
- Trinidad

**OBSERVE**
- Get process data
- Quality information
- Alarm data and limits
- Maintenance data

**ORIENT**
- Asset data model
- Integration & contextualization
- Visualization & insights
- AI/ML
- Knowledge and exp.

**ACT**
- Change set points
- Take operations and maintenance actions
- Change equipment configuration

**DECIDE**
- Remote monitoring, analysis and advisory
- Investigation
- Troubleshooting
- Optimization
- Water Treatment
- Rotating Equipment
- Process
- Fired Equipment

**NROC Colorado**
SMEs under one roof

**Vision**
Nitrogen Real-time Operations Center (NROC) Overview

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Home Safe, Every Day

Culture of Care

We care for ourselves, each other and our communities

Nutriën Way

- Take the time to work safely
- Identify hazards & stop work if necessary
- Pause frequently & focus
- Use the right tools & PPE for the job
- Look out for each other

Lead
Collab
Trust
NROC Solution Landscape

**AVEVA Unified Operation Center (UOC)**

- **AWS/INSIGHTS**
  - Alarm limits calculations
  - Mode calculations
  - Definitions

- **OPIS**
  - Operator logbook

- **ACCELERATOR**
  - Asset model / equipment hierarchy (Sensor and tag links)

- **POWER BI**
  - Alarms and event summary

- **SEEQ**
  - Process trends

**AWESOME CLOUD**

**Tungsten 2.0 Rest APIs**

**SITE APPS**

- **ERP- EAM**
- **LIMS System**
- **Simulation System** (Digital Twin)
- **Field Data Readings**
- **AVEVA PI SYSTEM + Other Historians**
- **Alarms and Event Management**

**Delivering Solutions, Changing the World.™**
NROC Solution Deliverables

**ENTERPRISE**
- Comparison between sites for production, energy, emission, and maintenance KPIs
- Comparison among critical equipment
- Identify best case and benchmarking
- Plant Overview with key KPIs and alerts with alarm personalization.

**PLANT**
- KPI deviation
- Plant KPIs and production forecast
- Active Key Alerts

**EQUIPMENT**
- Problematic Process Area
- Problematic Equipment

**Real-time Insights:**
- KPIs equipped with diverse predefined limits
- Real-time data triggers personalized alarms, ensuring prompt responsiveness

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Delivering Solutions, Changing the World™
AVEVA UOC | Central Tool for Remote Operations

- Related Trends
- Alarm Summary Dashboards and Reports
- Related Equipment Master Data and Work Order Summary
- Enterprise Level Dashboards
- Plant Level Dashboards
- Process Area Schematics
- Equipment Detailed Schematics
- Real time Alarm Data Management
- Aid incident investigation
- Generate knowledgebase
AVEVA UOC | Central Tool for Remote Operations

**Advanced Data Analytics:**
- Data comparison for insights across plants.
- Perform trends analysis in Seeq
- Perform detailed data analysis in Power BI

**Hierarchical Drill-Down:**
- Provides hierarchical navigation from enterprise to equipment level.
- Enables in-depth exploration of processes and subsystems.

**Contextualized Insights:**
- Presents contextual data for operations, maintenance, and quality.
- Empowers informed decision-making.

- Related Trends
- Alarm Summary Dashboards and Reports
- Related Equipment Master Data and Work Order Summary

- Enterprise Level Dashboards
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- Process Area Schematics
- Equipment Detailed Schematics

- Real time Alarm Data Management
- Aid incident investigation
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**Left Screen**

**Main Screen**

**Right Screen**
# KBR Key Design Anchors

## Approach

<table>
<thead>
<tr>
<th>Data Standardization</th>
<th>Templatization</th>
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<tbody>
<tr>
<td><strong>Consistency in data representation</strong>&lt;br&gt;Enables Quick comparisons between identical equipment, process areas</td>
<td><strong>Template-driven strategy</strong>&lt;br&gt;Consistent in visual representation&lt;br&gt;Expedites solution delivery</td>
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<tr>
<td><strong>Harmonization of diverse unit measurements</strong>&lt;br&gt;Enhance KPI value comparability</td>
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## Value Drivers

<table>
<thead>
<tr>
<th>Benchmarking</th>
<th>Personalized Alarms</th>
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<tbody>
<tr>
<td><strong>Benchmarking enablement across 13 ammonia plants</strong>&lt;br&gt;Identification of optimal KPIs to empower Subject Matter Experts (SMEs) in swift decision-making</td>
<td><strong>Customized alarms based on individual roles</strong>&lt;br&gt;Flexibility to define role-based severity and limits&lt;br&gt;Enhanced efficiency in addressing plant issues</td>
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## Key Success Factors

<table>
<thead>
<tr>
<th>The Right Partnership</th>
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<tbody>
<tr>
<td>✓ Delivery Partner with an understanding of the process, not just the digital tools</td>
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<td>✓ A partner agnostic to software provider</td>
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<tr>
<th>Agile Approach</th>
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<tbody>
<tr>
<td>✓ Early delivery and quicker value realization</td>
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<tr>
<td>✓ Lesser design gaps</td>
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<tr>
<td>✓ Early corrections and minimize rework</td>
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<tr>
<th>Scalability, Robustness and Flexibility</th>
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<tr>
<td><strong>Integration Framework</strong></td>
</tr>
<tr>
<td>✓ Rest APIs provided scalability and robustness to landscape</td>
</tr>
<tr>
<td>✓ Flexible to accommodate changing business needs</td>
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<th>Centralized Master Data Management</th>
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<tr>
<td>✓ Setting up right context to every configured data element e.g., assets, data values, target and limits</td>
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<tr>
<td>✓ Enabled analytical capabilities with less efforts in data modelling</td>
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<tr>
<th>Calculation Engines</th>
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<tr>
<td>✓ Simulation tools used for complex calculation e.g., equipment performance</td>
</tr>
<tr>
<td>✓ Simple calculations configured using Microsoft Excel spreadsheets</td>
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<tr>
<th>Communication &amp; Quality of Delivery</th>
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<tr>
<td>✓ Predefined templates for input collection enabled with validation mechanism</td>
</tr>
<tr>
<td>✓ Automated data load directly using the templates</td>
</tr>
<tr>
<td>✓ Validation with SME</td>
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Questions?

Please wait for the microphone. State your name and company.

Please remember to...

Navigate to this session in the mobile app to complete the survey.

Thank you!

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