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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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AVEVA



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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.**



An aerial photograph of a vast, lush green agricultural field, likely corn, with a tractor pulling a spray rig in the center. The sun is low in the sky, creating a warm, golden glow and long shadows across the rows of crops.

Nutrien[®]
Feeding the Future[™]



Nutrien[®]
Feeding the Future[™]

Nitrogen

Phosphate

Potash

Retail

Nutrien[®]

Feeding the Future[™]



25,000
EMPLOYEES



20
PRODUCTION
FACILITIES



2,000
RETAIL
LOCATIONS



\$30B
SALES



Government Solutions





Sustainable Technology
Solutions



Sustainable Technology
Solutions

Sustainable Technology

Sustainable Services



KBR works closely with

GOVERNMENT and INDUSTRY CLIENTS

to deliver science, technology and engineering solutions to governments and companies around the world.

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.*



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?

KBR INSITE® Process Performance – Center of Excellence



Standard INSITE® Modules

Asset Performance

- Catalyst
- Reformer
- Reactors
- Compressors
- Heat Exchangers

Advisory Reports

- Event Reports
- Benchmarking
- Best Practice
- Performance Reports

Advanced INSITE® Modules

Process Models

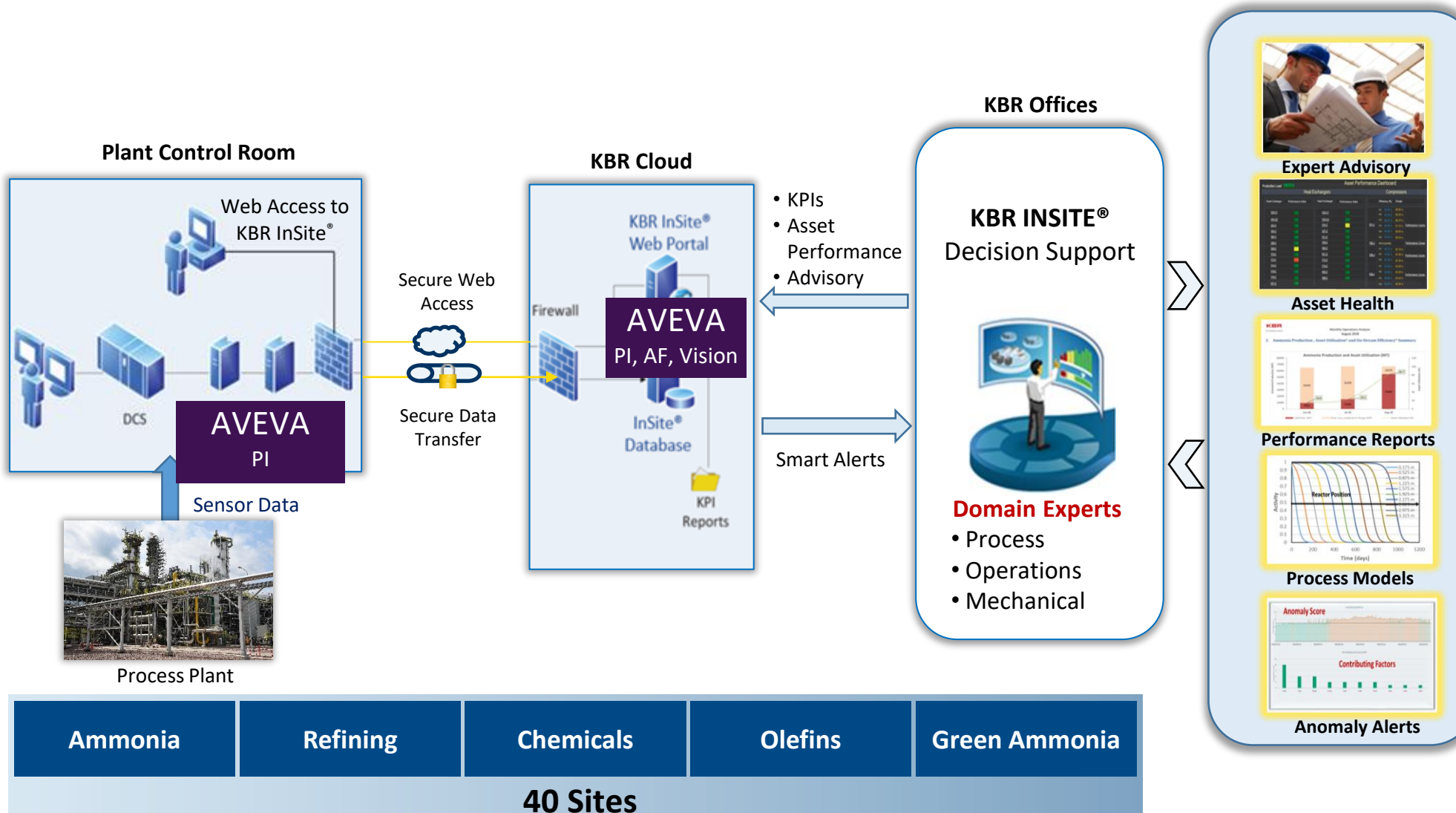
- Advanced KPI Calculations
- Data Reconciliation
- Process Optimization
- What-if Analysis

AI and Machine Learning

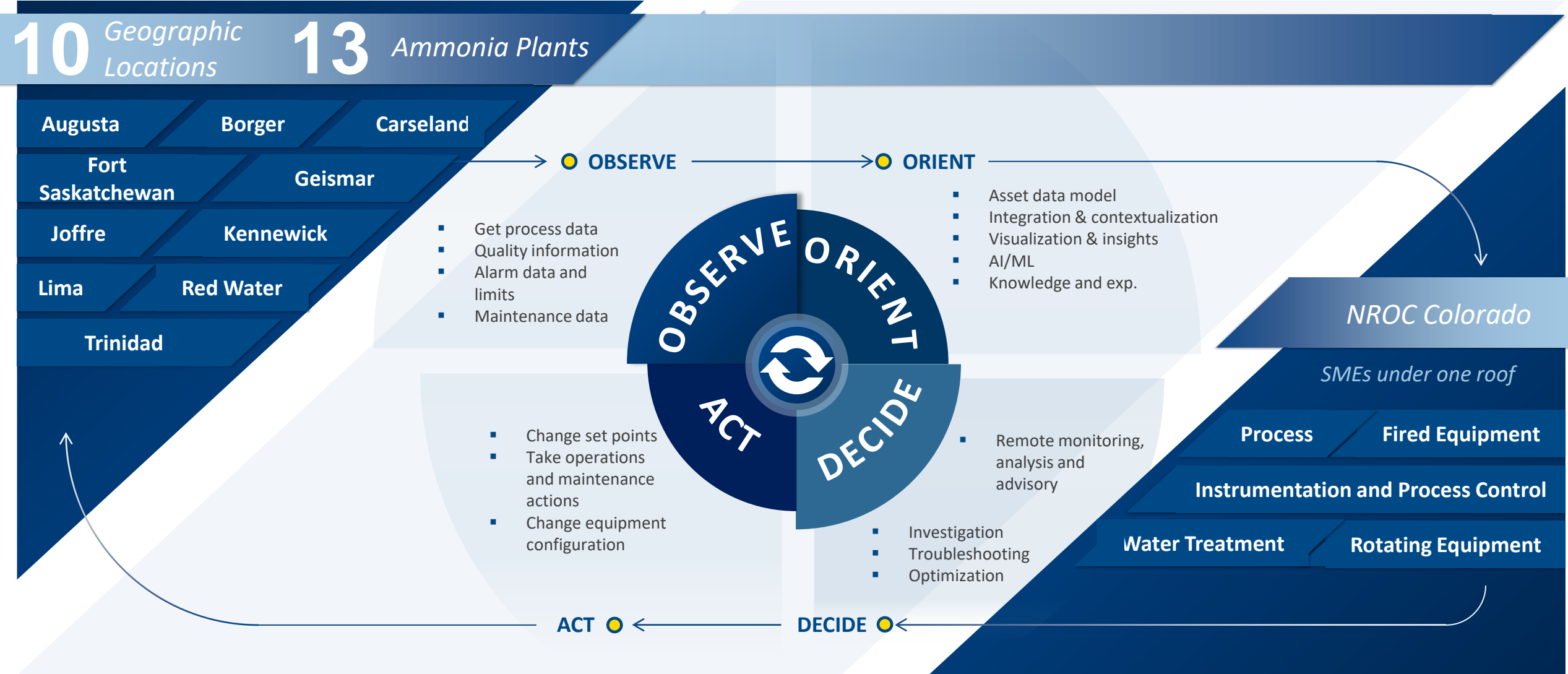
- Anomaly Detection
- Contribution Factors
- Root Cause Analysis
- Predictive Models

APC Recommendations and Monitoring

- Monitor APC Performance
- Provide Recommendations for Loop Tuning



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



Home Safe, Every Day

Culture of Care

Nutrien 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

AWS CLOUD

AVEVA Unified Operation Center (UOC)

AWS/INSIGHTS

- Alarm limits calculations
- Mode calculations
- Definitions

OPIS

- Operator logbook

- Process hierarchy, equipment and online sensors
- Equipment templates
- Alarm management
- Personification of data

- Equipment/train level displays
- Area level process schematics
- Site process overview displays
- Plant level dashboards
- Enterprise level dashboards

POWER BI

- Alarms and event summary

SEEQ

- Process trends

ACCELERATOR – ASSET MODEL / EQUIPMENT HIERARCHY (Sensor and tag links)

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

AVEVA PI (Enterprise)

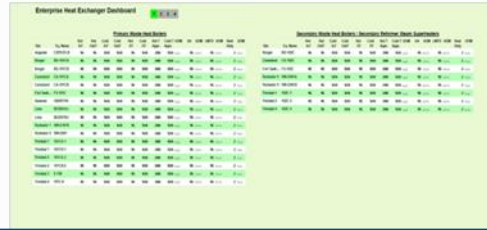
NROC Solution Deliverables



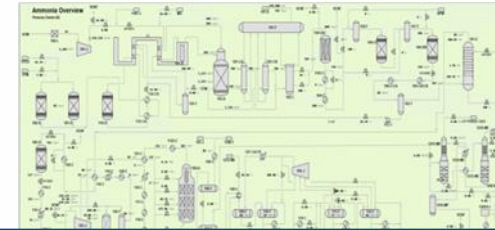
ENTERPRISE



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.

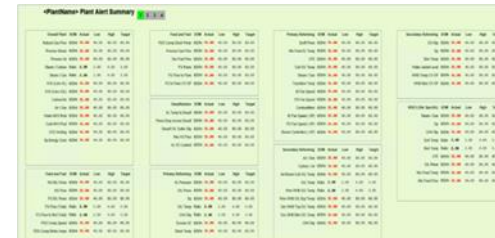
PLANT



KPI deviation

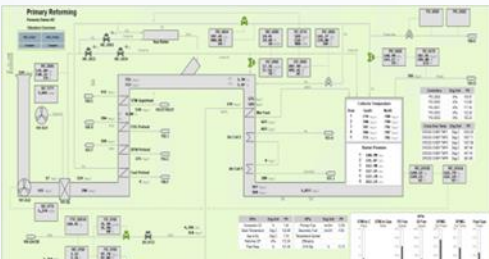


Plant KPIs and production forecast



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

500+
Displays

3000+
Assets

100+
Templates

10000+
Monitoring
Parameters

200+
KPIs

Nutrien™

Nut

ADEYINKA OPADEYI

SR ENGINEER
AMMONIA PROCESS NROC

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



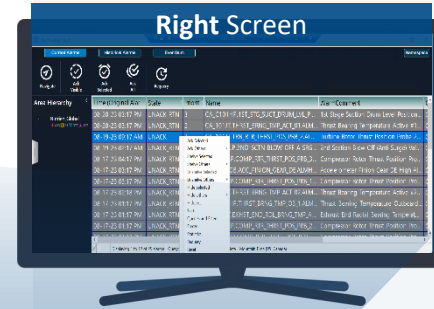
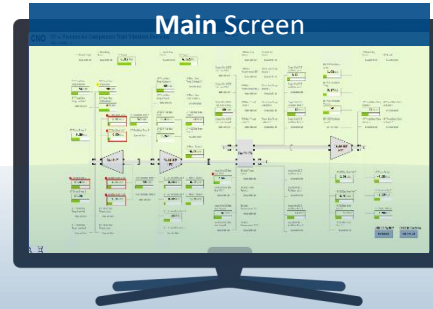
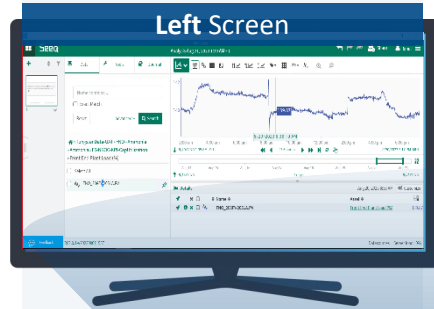
Advanced Data Analytics:

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

- 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



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.



Approach		Value Drivers	
Data Standardization	Templatization	Benchmarking	Personalized Alarms
<p>Consistency in data representation</p> <hr/> <p><i>Enables Quick comparisons between identical equipment, process areas</i></p>	<p>Template-driven strategy</p> <hr/> <p><i>Consistent in visual representation</i></p> <hr/> <p><i>Expedited solution delivery</i></p>	<p>Benchmarking enablement across 13 ammonia plants</p> <hr/> <p><i>Identification of optimal KPIs to empower Subject Matter Experts (SMEs) in swift decision-making</i></p>	<p>Customized alarms based on individual roles</p> <hr/> <p><i>Flexibility to define role-based severity and limits</i></p> <hr/> <p><i>Enhanced efficiency in addressing plant issues</i></p>
<p>Harmonization of diverse unit measurements</p> <hr/> <p><i>Enhance KPI value comparability</i></p>			

The Right Partnership

- ✓ Delivery Partner with an understanding of the process, not just the digital tools
- ✓ A partner agnostic to software provider

Agile Approach

- ✓ Early delivery and quicker value realization
- ✓ Lesser design gaps
- ✓ Early corrections and minimize rework

Scalability, Robustness and Flexibility

Integration Framework

- ✓ Rest APIs provided scalability and robustness to landscape
- ✓ Flexible to accommodate changing business needs

Centralized Master Data Management

- ✓ Setting up right context to every configured data element e.g., assets, data values, target and limits
- ✓ Enabled analytical capabilities with less efforts in data modelling

Calculation Engines

- ✓ Simulation tools used for complex calculation e.g., equipment performance
- ✓ Simple calculations configured using Microsoft Excel spreadsheets

Communication & Quality of Delivery

- ✓ Predefined templates for input collection enabled with validation mechanism
- ✓ Automated data load directly using the templates
- ✓ Validation with SME

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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AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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