bp: An overview of bp’s key real-time products and solutions

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bp
• bp Context and General Updates

• bp Production and Operations Chemical Management Decision Support System
  • Chemical Injection Inventory Management System (CIIMs)
    • Value Statement
    • Capability and Feature Overview
    • Tool Deep Dive

• bp Production and Operations Refinery Management
  • bp AIMS Tool (Asset Intelligence for Monitoring and Surveillance)
    • Value Statement
    • A Product Overview and Deep Dive
    • Good Practices / Findings

• OPAL Program Overview
bp context and approximate usage of AVEVA PI products

- **Business areas**: 4
- **PI servers**: 60+
- **PI interfaces**: 318+
- **PI tags**: 3.9m+
- **PI AF analyses**: 187k+
- **PI Vision analytics**: 12.5k+
How bp leverage AVEVA PI products to Proactively Manage Production Chemicals
CIIMS Value Statement

$7M Per Annum Savings through better management of Chemical Spend via the use of the CIIMS decision support system

- Provides Central Management of Production Chemistry Calculations
- Provides timely alerts of excursions
- Provides a decision support system that enhances process performance and reduction of deferrals
- Provides a digital solution to aid Production Chemists in meeting PHCA compliance standards

10% Recognized Overdosing
50% Annual Target Dosing Spend Reduction

16 Sites Live
Coming 2024

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CIIMs Capability and Features

- Level 0 Dashboards allow our Production Chemists to see a manageable overview across all assets so that they can more easily manage chemical products.
- Displays Chemical injection points along with chemical and most of the relevant information like Dosage, Corresponding Pumps status, Chemical injection rate, target flow rate in real-time. Other related attributes can be added as required.
- Forecasting remaining inventory to provide lead times for planning and managing replenishments.
- Provides a user interface for manually inputting KPI Targets, Limits, Setpoints, Process Variables, and CIIMs Configuration updates.
Our production chemists needed a way to better wholistically manage where intervention was required so that they could make informed decisions and better optimize where to employ chemical remediations.
The Story

Our production chemists needed a way to monitor their chemical inventories in real time and to be able to forecast how much time before a given chemical would run out.
Our production chemists needed a way to take a deeper look at injections against target dosage limits.

AntiFoam-Process Injection Trends

- **IP1-T1 PROD MNFLD Chart-1**
  - Dosage-High Limit: 8 ppm v/v
  - Dosage-Low Limit: 2 ppm v/v
  - Target Dosage: 3 ppm v/v

- **IP2-T2 PROD MNFLD Chart-1**
  - Dosage-High Limit: 8 ppm v/v
  - Dosage-Low Limit: 2 ppm v/v
  - Target Dosage: 3 ppm v/v

- **IP3-TEST MNFLD Chart-1**
  - Dosage-High Limit: 8 ppm v/v
  - Dosage-Low Limit: 2 ppm v/v

- **Chart-2**
  - Flow: 1.6673E+05 L/h
  - Injection Rate: 0.54144 L/h
  - Target Barrier Availability: 95%
  - Target Injection Rate: 0.05744 L/h

- **Chart-2**
  - Flow: 1.3645E+05 L/h
  - Injection Rate: 0.5045 L/h
  - Target Barrier Availability: 95%
  - Target Injection Rate: 0.02744 L/h

- **Chart-2**
  - Flow: 6.999.9 L/h
  - Injection Rate: 9 L/h
  - Target Barrier Availability: 95%
  - Target Injection Rate: 0.03984 L/h
The Story

Our production chemists needed a way to review the injection points along with relevant information like dosage, pump status, chemical injection rates, and target flow rates in real-time.
CIIMs Modules Deep Dive: Process Systems Overviews Cont.’
What’s next for CIIMS?

- GOM Rollout (est. 2024)
- Feature Expansion in AGT
How bp leverage AVEVA PI products to Proactively Manage Refinery Units
AIMS Value Statement

$5M

YTD Value generated through the reliability improvements, commercial optimization, and digital risk reduction using the AIMS platform

- Provides one version of the truth for process data and calculations
- Enables remote monitoring and collaboration
- Enhances Refinery wide Mass Balancing Capabilities
- UHM Reporting capabilities
- Enables rapid solution rollouts across 6 refineries

Unit Delivery by Year

2022: 11
2023: 25
2024: 42
2025: 61
2026: 77
2027: 94

Coming
Live Units

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AIMS Journey

The Story

AIMS’ genesis was rooted in the recognized need to provide our process engineers with a more optimized way of performing unit health monitoring and mass balance reconciliation across all refineries. Their legacy platform struggled to scale and proved to be a complex and difficult system to sustain.

The Backbone

Key Challenges

- Tuning Calculation Frequency
- Managing Template Versions
- Prioritizing Analyses Calcs
- Handling varying UOMs
- Tuning the End to End Critical Data Pipeline

The path to standardization

- AF drove Immediate benefits toward scaling and standardization
- AF provides the platform we needed to overcome new and pre-existing challenges
- Process Engineers are a Part of the Team helping drive best practices
AIMS Overview of Good Practices

Context

AIMS is on a 7-year journey, and the team have faced varying challenges along the way. The team have identified the following best practices that have helped keep the program from hitting roadblocks that could compromise delivery.

Leverage PI AF Tables

- Use of tables to manage template versions across units
- Use of tables to map inputs required for composite formulas

Deployment Automation

- Unique ways identified to handle the heavy lifting data validations
- Unique ways found to assist in migration packages

Standardize through Templates

- Leverage AF to clean up unit attribution and make them more complete in a way that scales
- Ensure you have governance support to manage the onboarding of new UOMs
- Ensure you have governance support to be stewards or process calculations
How bp leverage AVEVA PI products to drive our OPAL Initiative
OPAL: Optimized Process & Analytics Launchpad

- **P&O strategic** Refining information system
  - Designed for efficient and effective information access by all Personas and disciplines at refineries and support organizations worldwide
  - Providing user-centric information presentation based on use cases across the organization

- Home for **centrally managed** process unit **calculations, reports, dashboards, events, and displays**
  - Standardized graphic displays for Refining/unit/asset monitoring

- **Integrated** platform approach to maximize user efficiency in daily information work enabled by the cloud-based PI Asset Framework, PI Advance Analytics and PI Archive
  - Visualization in PI Vision
  - Contextualization and linking of spread information to form a launchpad for users
  - Standardization of best practice approaches
  - Supporting possible advanced visualization and analysis in Power BI
  - Supporting possible application/workflow solutions in Power Apps
Ontologies/Asset Hierarchy and PI-AF functions as the “data directory” to organize and enhance data. This hosts centralized standards and static / design equipment information.

User starts his journey here.

PI Vision for schematics & trending, and more use cases in accordance to centralized standards.
OPAL Use cases
(subset on PI system)
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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