UOP Creates Knowledge for the Oil and Gas Industry

UOP technology makes more than 60% of the world’s gasoline, 70% of its polyester and 90% of biodegradable detergents, and processes more than 40% of its LNG.

Better Economics
UOP technologies offer a high return on investment

Continuous Innovation
Continuous technology improvement allows customer operations to remain cutting edge

Reliability
UOP technologies are among the most widely proven in the world

Expertise
UOP has a century-long record leading technology development for the oil and gas industry

- Process Technology
- Catalysts
- Adsorbents
- Equipment
- Services

2,500 Engineers and scientists
200 with PhDs
3,000+ Active patents
800+ R&D employees

31 out of 36 refining technologies in use today were developed by UOP

Largest process licensing organization in the Oil & Gas market

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UOP Current Support Services

- Regional Services
  - Direct & continual contact with experienced UOP service manager
  - On-going technical support
  - Consultation, troubleshooting, best practices, opportunity identification, data review
  - Opportunity to mentor new engineers in UOP processes
  - Catalyst & adsorbents services
  - Operational efficiencies
  - Provides link to entire UOP array of technical and skill specialists

- Technology Services

- Field Services
  - Start-up and Product Reload Services
  - Inspection

- Training Services

- Process Transformation

- Optimization and Energy Studies
What do the customers say they want?

- What is the true function of Technical Services
  - Increased Uptime
  - Operating Expense Savings
  - Consumable lifespan
  - Maintenance
  - Process Optimization
Sound familiar?

- Improve stability
- Move closer to specification limit
Enterprise Needs for Operational Analytics

Collecting and storing all relevant data in the organization

Predicting and detecting issues and opportunities

Visualizing information anytime anywhere to gain valuable insights

Making right decisions at the right time with the right information
Challenges

- Engineers spending too much time extracting and aligning data from various sources
- Different tools needed for each type of data; different users have access to different tools
- Users constructing isolated and inconsistent analysis tools
- Lack of visibility to real-time performance against business metrics
Dehydration Process Technology

Major Equipment Items:
- Feed Gas Separator (KO Drum), Product Gas Filters
- Multiple Adsorber Vessels (Parallel Adsorption Service & Regeneration)
- Regeneration Heater, Regeneration Gas Cooler, Regeneration Gas KO Drum
UOP Guard Product Portfolio

Uniformance® PHD
- Capture and store relevant real-time process and event data
- Collect and store millions of values per second
- Experion and OPC connectivity and auto tag maintenance
- Included interfaces for user application connectivity
- Use with asset model (Asset Sentinel) for “big data” analytics

Loop Scout®
- Communication architecture enabling process plant connectivity
- SSL encryption and communication built into the tool
- Batch transmission capabilities to accommodate slower internet connections
- Comprehensive OPC Server communication capabilities
UOP Guard Product Portfolio

Uniformance® Asset Sentinel

- Detect and predict risks and opportunities with asset-centric advanced analytics
- Powerful analytics with asset-based calculations and fault models
- Integrated workflow from alert notification, troubleshooting, to problem resolution
- Embedded process content (pump, compressors, turbines, etc.) and thermodynamic package
- Email & mobile notifications for faster response

UniSim® Design

- Intuitive and interactive process modeling environment
- Enables engineers to create steady-state and dynamic models for plant and control design
- Also used for performance monitoring, troubleshooting, operational improvement, business planning, and asset management
UOP Guard Product Portfolio
UOP Guard Product Portfolio
Customer Login to UOP Customer Portal
ARMGuard Dashboard
Challenges

- Engineers spending too much time extracting and aligning data from various sources
- Different tools needed for each type of data; different users have access to different tools
- Users constructing isolated and inconsistent analysis tools
- Lack of visibility to real-time performance against business metrics
Addressing the Challenges

Curated data available real time to any level of the business

All levels of organization have access to a common dashboard through existing UOP Customer Portal

Complex analytics used by UOP Technical Service available 24/7

Business metrics reported clearly through OPEX savings and extended consumable life
Connected Performance Services (CPS)

Knowledge Delivery as a Service

Key Customer Challenges

Unplanned Downtime
- Process issues
- Equipment failures

Human Capital Challenges
- Knowledge gaps
- Operational excellence

Underperforming Assets
- Sub-optimal operations
- Performance vs peers

Energy and Emissions
- Emission standards
- Energy reduction

The Connected Plant Delivered with CPS

- Analyze plant performance to reveal full potential through a Cloud-based service
  - Around-the-clock monitoring of plant data and rigorous simulations
  - Provides on-going, operational recommendations to close performance gaps
  - Leveraging UOP Process Models & longstanding experience in operational support and troubleshooting
- Combining 100+ years of Oil & Gas processing experience with next-generation software platforms
CPS Solutions

Process Reliability Advisor
- Pre-empt process issues with embedded root cause analysis
- Operate closer to constraints
- Drive best operating practices

Process Optimization Advisor
- Maximize profitability through changing process and economic conditions
- Evaluate new opportunities with “what-if” analysis
Understanding ARMGuard and CPS

• ARMGuard
  - Specific application for natural gas dehydration process units
  - Open loop tool for operators and plant engineers
  - Adsorbent optimization around a single process unit
  - Focal area is consumable lifespan
  - Periodic alerts based on KPI deviations
  - Quarterly reports
  - Can be integrated into the CPS overall gas plant offering

• CPS
  - Developed for complex refinery and petrochemical processes
  - Open loop tool for plant managers and business enterprise decision makers
  - Process optimization complex wide
  - Two key focal areas: Reliability and Optimization
  - Around the clock monitoring by UOP process specialist
  - Process Reliability solution for gas plants will include ARMGuard application
Discussion Questions

1. How do you see your enterprise taking advantage of these new possibilities?
2. What other process or equipment applications do you view this as potentially valuable?
3. Where is your plant investing in “Connected” offerings?
4. How do you see Honeywell supporting?