LEVERAGE THE CLOUD TO DRIVE OPERATIONAL EXCELLENCE

Honeywell Connected Plant Solution From UOP
Honeywell UOP Creates Knowledge for the Oil and Gas Industry

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

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

UOP technologies are among the most widely proven in the world

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

Largest process licensing organization in the world
Key Customer Challenges

- **Energy and Emissions**
  - Emission standards
  - Energy reduction

- **Human Capital Challenges**
  - Knowledge gaps
  - Operational excellence

- **Underperforming Assets**
  - Sub-optimal operations
  - Performance vs peers

- **Unplanned Downtime**
  - Process issues
  - Equipment failures
Honeywell Connected Plant: Delivering What No One Else Can

UOP Domain Knowledge
+ HPS Capabilities
+ Partner Network

Honeywell Connected Plant

Industrial Software Solutions + Connected Platform for Operational Excellence

Cyber Secured Data Stream

Disparate Data Across Enterprise

Connected Plant

Process Availability & Optimization

OEM Partner Ecosystem

Equipment Availability Utilizing Partnerships

Analytics Based Insight at Enterprise Level

Process Specialist

Customer SME

Decisions & Actions

Digital Twin

Connected Plant
Honeywell Connected Plant Solutions from UOP

**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
Cloud Platform Architecture

Proactive, ongoing dialogue and recommendations. UOP expert review

Ongoing capture of plant (process/lab) data

Customer Site

Secure Honeywell cloud

Data Cleansing
Advanced Computation
Visualization

Gross Error Detection
Data Conditioning
Data Reconciliation

Purity
Production
Energy
Capacity

Solution-specific calculations and models
UOP expert reviews

Key Software

- Loop Scout®
- Uniformance® PHD
- Uniformance® Asset Sentinel
- UniSim® Design
- Hadoop® Data Lake
Solution Video

Process Reliability Advisor for Hydrocracking units

Check out more videos at www.uop.com/cps or at the Knowledge Center
Process Reliability Advisor

What is behind it?:
• Matches unit configuration
• Tuned UOP process models
• Technology specific fault models
• Embedded UOP knowledge, context, and background

What does it do?:
• Monitoring of unit performance
• Constraint limitations
• Event detection & mitigation
• Knowledge transfer
Process Reliability Advisor Use Case

for FCC units

Increased Catalyst Losses:

- Customer has an increase of catalyst losses from both the reactor and regenerator by 150%
- Customer has concerns with potential erosion in MCB, catalyst fines collection from Regenerator and Opacity increase in flue gas

Identification

- UOP review of the Particle Size Distribution (PSD) suggested root cause is attrition
- Jet Velocities of equipment confirmed source of attrition as high jet velocity of Lower Stripping Steam ring
- Field Survey also revealed open blast points

Solution

With Process Reliability Advisor
- Early event detection to flag potential operations that cause catalyst losses
- Around the clock monitoring of key faults tied to KPIs (e.g. Jet Velocities)
- Troubleshooting guidance to help fine tune the root cause
Process Reliability Advisor

Allows Customers to Detect and Solve Potential Problems Before They Happen

Resolution time from months and weeks to day and hours

Potential Downtime ~$1M/Day

No Downtime $0/Day

• Embedded Root Cause Analysis models constantly monitoring the process
• UOP Expert collaboration drives on cloud-platform drives pro-active troubleshooting

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On-Going Interaction with UOP Specialist

**Recommendations**
Have UOP become part of Your Team
- Early event detection and operational recommendations provided in Dashboard
- Regular interactions to discuss benefits

**Modifications**
Gain from Continuous Innovation
- Added enhancements to the Solutions
- Make minor process configuration updates

**Maintenance**
UOP will keep the system running by conducting all needed maintenance of Software & Hardware including tuning of the process models
Honeywell Connected Plant, Unequalled Equation for Success

We connect processes, assets and people to continually redefine optimal performance

- Deep domain expertise
- Data contextualization and historization
- Optimization & analytics via the digital twin
- Broad ecosystem of expertise & capabilities
- Predictive asset performance, increase uptime, decrease downtime
- Seamless knowledge transfer and competency mgmt.
- Enhanced decisions via data analytics
- Worker safety & compliance
- Unmatched industry offering
- Integrated solutions that span the entire enterprise

Based on foundation of advanced software solutions