



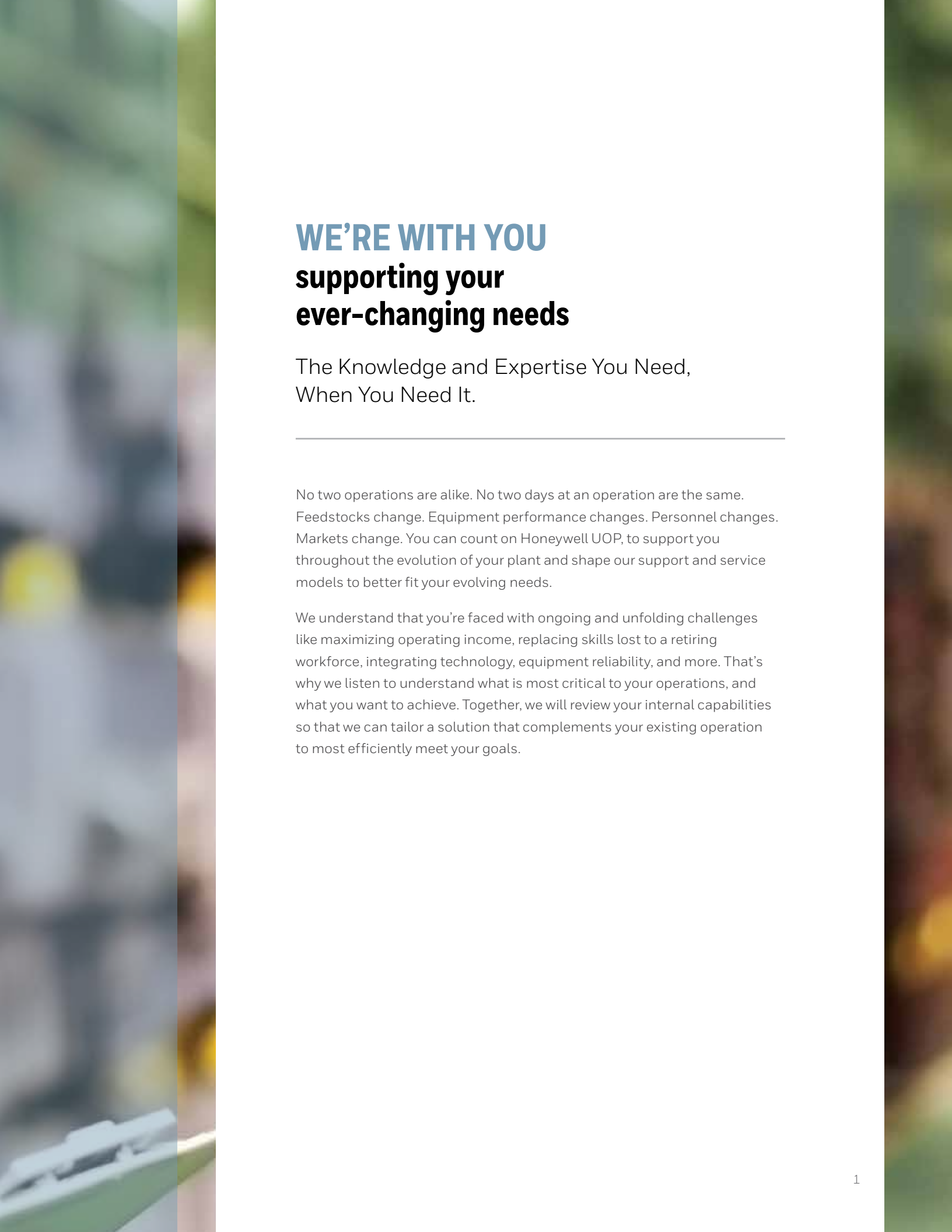
WE'RE WITH YOU Every Step of the Way

Custom Lifecycle Solutions for your operation





“ The experienced team at UOP understands the changing landscape and has helped me adapt as my needs change. ”



WE'RE WITH YOU **supporting your** **ever-changing needs**

The Knowledge and Expertise You Need,
When You Need It.

No two operations are alike. No two days at an operation are the same. Feedstocks change. Equipment performance changes. Personnel changes. Markets change. You can count on Honeywell UOP, to support you throughout the evolution of your plant and shape our support and service models to better fit your evolving needs.

We understand that you're faced with ongoing and unfolding challenges like maximizing operating income, replacing skills lost to a retiring workforce, integrating technology, equipment reliability, and more. That's why we listen to understand what is most critical to your operations, and what you want to achieve. Together, we will review your internal capabilities so that we can tailor a solution that complements your existing operation to most efficiently meet your goals.

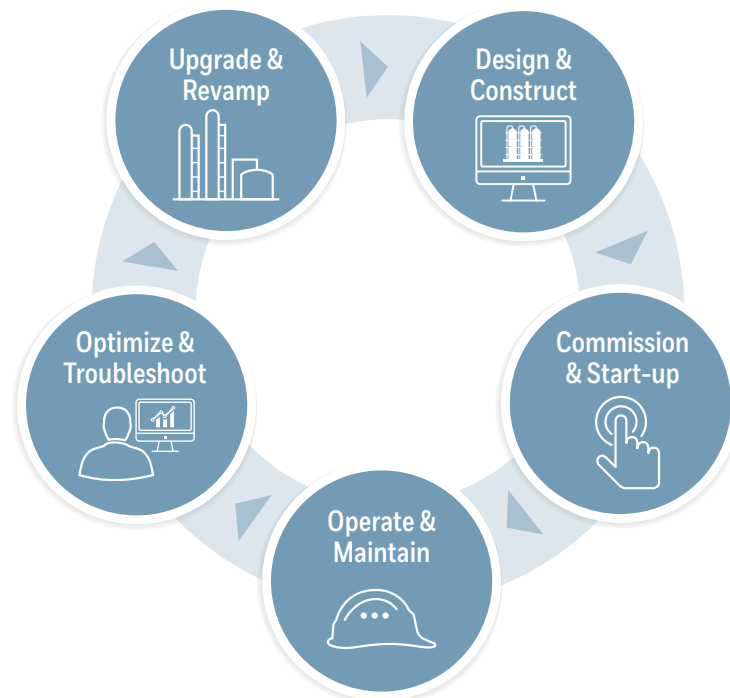


WE'RE WITH YOU **supporting you as your** **lifecycle needs change**

It Starts With A Conversation, Not A Catalog.

At UOP, we don't believe in a one size fits all approach to lifecycle management. You have unique needs and capabilities that impact your operations, and our approach is tailored to your needs.

Whether you are looking for a little bit of help or a lot of help, UOP is here for you. UOP's custom solutions allow you to fully engage the experts at UOP or just supplement your own house capabilities. Either way, we work with you to develop a solution that is right for YOU. You can rely on UOP to bring our unique knowledge, expertise and industry experience to all aspects of your operations- from design to construction to maintenance and optimization. UOP is here to help you and can make it happen.





WE'RE WITH YOU to help you overcome the challenges you face

We're Here to Listen Every Step of the Way.

We know your issues, challenges and needs can change over time, so let's start the conversation...and keep on talking.

We are here to help- from design challenges like Process Safety and regulatory compliance to improved energy consumption or equipment and process upgrades and optimizations over the years.

We know your needs are constantly changing, and we're here to help you meet your changing demands as you progress through the lifecycle of your operations...

Upgrade & Revamp

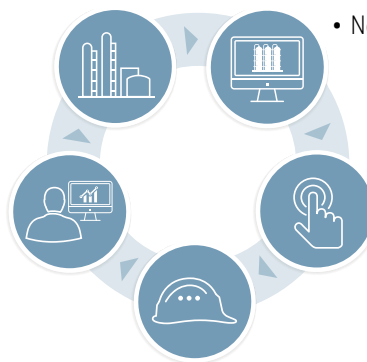
- Production Increases
- Reliability Improvements
- Optimized Execution

Design & Construct

- Innovative, Reliable Technology
- Modular Design & Equipment Supply
- Process Safety & Regulatory Compliance
- New Engineer Onboarding

Optimize & Troubleshoot

- Problem Resolution
- Capacity & Yield Optimization
- Utility Optimization



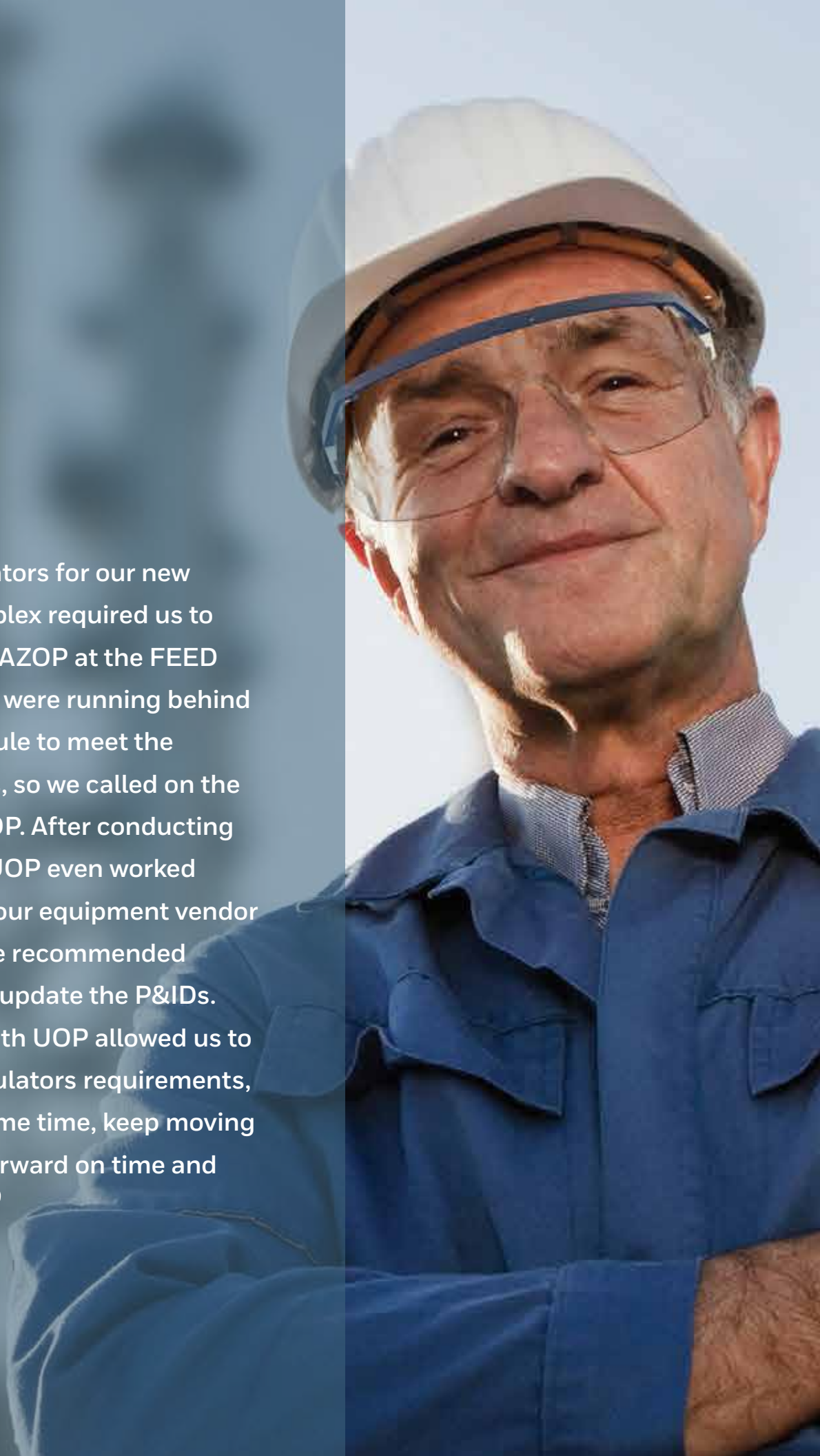
Commission & Start-up

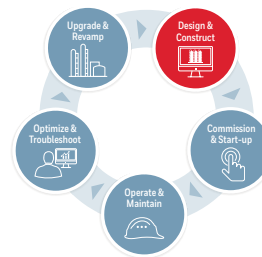
- Employee Skills & Competency Development
- Checkout & Preparation
- Catalyst & Materials Assistance
- Procedures
- Operations Testing & Benchmarking

Operate & Maintain

- Equipment Reliability & Maintenance
- Production Reliability
- Competency Management

“ Our regulators for our new refinery complex required us to complete a HAZOP at the FEED stage, but we were running behind on our schedule to meet the requirements, so we called on the experts at UOP. After conducting the HAZOP, UOP even worked directly with our equipment vendor to make some recommended changes and update the P&IDs. Partnering with UOP allowed us to meet our regulators requirements, and at the same time, keep moving the project forward on time and on budget. ”





WE'RE WITH YOU throughout the Design and Construction of your operations

We're here to help you implement the most innovative and reliable technology...safely, efficiently and cost effectively.

There's a lot to consider when designing and building a new unit, process or complex. The experts at UOP have seen it all, and are here to help you deliver on time, and on budget. You can rely on the trusted advisors at UOP for everything from technology design, engineering, safety, to modular design and equipment supply.

Throughout the Design and Construction phases, customers turn to UOP for:

Innovative, Reliable Technology

- 70+ Innovative Refining, Petrochemical & Gas Processing Technologies
- Premium Catalysts & Adsorbents
- Basic Engineering Design
- Front-End Engineering Services
- 3D Model Reviews
- Advanced Distillation & Heat Transfer Solutions
- Hydrogen Solutions

Modular Design & Equipment Supply

- Skid-Mounted Modules & Individual Process Units
- Speciality Equipment
- Proprietary Control Systems
- Shop Inspections

Process Safety & Regulatory Compliance

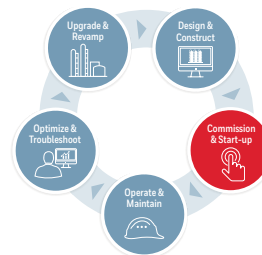
- HAZOP, HAZID, ENVID, LOPA, PHA, SIL
- Process Safety Training

New Engineer Onboarding

- Engineering Design Seminar
- Residency Programs



“ We were starting up a new Propane Dehydrogenation unit, which was new technology for us, so our in-house knowledge was very limited. UOP proposed a training solution that included both process technology and simulator training. Through this program, our team developed the process knowledge and technical capabilities needed to achieve consistent unit operations and production targets. In the end, this helped us shave 11 days off of our planned start up schedule. Those additional 11 days translated to almost \$10 Million in added revenue. ”



WE'RE WITH YOU as your trusted advisor during Commissioning and Start-up of your operations

We understand the investment you're making in your operations, and how important safe and effective commissioning and start-up are to begin production and start generating profits.

We're here to help you to help you maximize the investment you're making in your operations, starting with safe and effective commissioning and start-up.

Let the experts at UOP help you get a jump start on production with:

Employee Skills & Competency Development

- Classroom Training: Technology Fundamentals
- Training Simulators
- On-the-job Training

Checkout & Preparation

- Equipment Specification Validation
- Vessel, Piping, Instrumentation, Control System Checks
- Punchlist & Deviation Review and Resolution
- Laboratory Setup & Validation Assistance
- Specialized Instrumentation Setup

Catalyst & Materials Assistance

- Inspect & Inventory Catalysts, Adsorbents, Chemicals
- Development of Loading Procedures & Loading Monitoring
- Provide Catalyst, Adsorbent, Loading Assistance

Procedures

- Commissioning Planning & Scheduling
- Development of Customized Commissioning, Startup, Operating, Shutdown & Emergency Procedures
- Construct Lab Schedule (Start Up & Normal Operations)
- Safety Audits
- Daily Commissioning Instructions & Reporting

Operations Testing & Benchmarking

- Instrumentation & Control System Tuning
- Construct Material & Utility Balance
- Establish Data Collection Method
- Continuous Operations Evaluation & Reporting
- Performance Test Procedures & Evaluation



“ When our pipeline froze in the middle of a harsh winter, stopping feed to our Steam Methane Reformer, we thought we would have to shut down the entire refinery. UOP’s on-site advisors developed an operations strategy to maintain Platforming hydrogen production and keep the refinery running 8 more weeks until SMR feed could be restored. This UOP solution included pre-planning turnaround repairs and delivering emergency make up catalyst. With UOP’s guidance, we avoided an early shutdown and were able to reclaim \$11.2MM in operating margin over the 8 weeks the run was extended. ”



WE'RE WITH YOU to help you with Operation and Maintenance

We're here to help you proactively identify and implement strategies for optimizing the reliability of your assets by developing and deploying effective Operations and Maintenance capabilities.

While your production starts with the most innovative and reliable technology...it doesn't end there. We understand that strong operational and maintenance disciplines are needed to ensure you are getting the most out of your current assets. The team of experts at UOP can help you with a focus that maximizes your return on investment.

For the Operation and Maintenance of your equipment, turn to the experts and UOP to help you with:

Equipment Reliability & Maintenance

- Inspection Services
- Corrosion Management
- Turnaround Planning
- Equipment Spare Parts

Competency Management

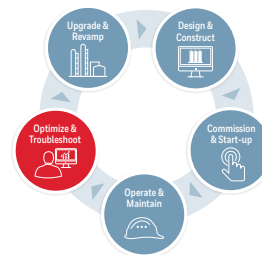
- Self-Paced Learning: Web-Based Training
- Self-Paced Learning: Expert Systems
- Advanced Operations & Troubleshooting Training
- On-site Coaching and Mentoring

Production Reliability

- Catalyst Regeneration Assistance
- Continuous Performance Monitoring
- Catalyst/Adsorbent Life Management
- Catalyst Reloading Assistance
- Precious Metal Management
- IIOT cloud-enabled Troubleshooting Services
- IIOT cloud-enabled Optimization Services



“ We needed to increase our LCO Hydrocracker throughput and improve diesel yield to take advantage of a particularly favorable diesel market but we were bumping up against the unit’s design limits. UOP conducted an evaluation of the unit’s bed quenches and established updated guidelines for safe upper operating limits of the LCO reactor. With more optimized operational guidelines, we were able to safely and significantly increase the unit’s feed rate and percentage diesel yield and capture an additional \$100K/day in operating margin. ”



WE'RE WITH YOU to help you Optimize and Troubleshoot your operations

We're here to help you optimize under-performing assets, and help you to quickly get back to full production capabilities when problems jeopardize your production.

We know that underperforming assets, or even worse...DOWN assets, can be one of the biggest challenges in your plant's operations. Our experts are here to help you develop strategies for proactively optimizing current capabilities. We're also here when you need us most: when problems threaten your production and speedy resolution is critical.

When It comes to Optimizing and Troubleshooting, UOP customers turn to our experts for:

Problem Resolution

- Expert Troubleshooting Services
- Inspection Services
- Laboratory Services
- Catalyst Analytical Services
- Automated Troubleshooting Recommendations Based on Operating Data
- Process Safety Incident Reviews
- Hydrogen Solutions
- IIOT cloud-enabled Troubleshooting Services
- IIOT cloud-enabled Optimization Services

Capacity & Yield Optimization

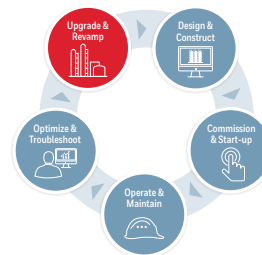
- Unit Performance Evaluations/Audits
- Automated Optimization Recommendations Based on Customer Economics
- Assessment of Feed and/or Product Specification Changes

Utility Optimization

- Heater Audits
- Rotating Equipment Audits
- Hydrogen Management Studies
- Control System Tuning, Optimization & Updates



“ We built our Parex unit in 1973 and purchased a Rotary Valve. Over the years, we had developed what we thought was an optimal maintenance program to optimize RV uptime. However, after a visit to our site, a UOP technical advisor noticed that compared to more modern design, we experienced more mechanical maintenance issues including excessive movement and increases in pins sheering. The UOP expert recommended several technology upgrades that became available after our original 1973 purchase. By upgrading to the new technology, we have significantly increased reliability and cut our unplanned RV outages in half...resulting in significant gains in uptime and production. ”



WE'RE WITH YOU when it comes time to Upgrade or Revamp your equipment

We're here to help you proactively develop and execute strategies for maximizing your investment by implementing technology upgrades and/or revamping current equipment.

We understand the pressures of getting the most out of your current assets. Identifying when equipment and technology upgrades will cost-effectively improve output and product quality are just a few of the ways the experts at UOP can help you maximize your return on investment.

Through Upgrade and Revamp strategies, UOP has helped customers achieve:

Production Increases

- Customized Revamp Studies
- Catalyst and Adsorbent Upgrades
- Distillation Trays Replacement
- Heat Exchanger Tube Replacement
- Alternate Feed & Product Evaluations

Reliability Improvements

- Control System Upgrades
- Burner & Flare Replacement
- Regulatory Compliance

Optimized Execution

- Modular Revamps
- Maximum Re-use of Equipment

More than 100 years of global experience, and counting

Honeywell UOP provides process technology, materials, and equipment for gas processing, refining and petrochemical industries. With 16 engineering and R&D centers and 13 manufacturing facilities in 19 countries, we are close to our customers wherever they are. Since 1914, UOP has developed more than 70 licensed processes and have 3,000 active patents for the industries we serve.







WE'RE WITH YOU.
Let's have
that conversation.

For more information

To schedule a call or an onsite meeting to review your operation and needs, contact us at 847-391-2000 or visit uop.com.

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