

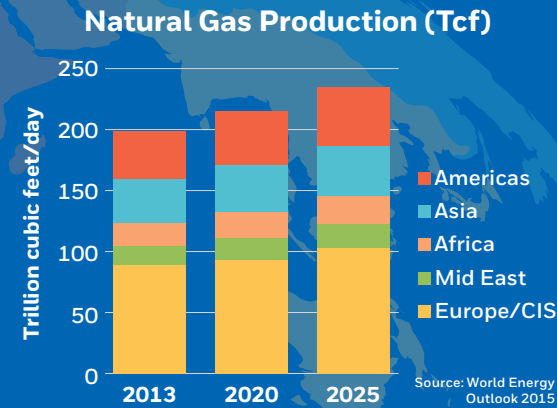
Gas Processing

Speed. Simplicity. Efficiency

Modular Gas Processing Plants

The Golden Age of Gas

Over the next decade, global gas use will rise by more than 20% and will account for almost one quarter of energy demand. To prepare for this, it is vital that we develop existing, proven reserves and tap into the world's vast unconventional gas and oil resources, but this doesn't come without challenges.



To Meet Demand, Gas Processors Need the Right Solution

Much of the world's gas reserves are located in remote, hard-to-reach locations, requiring solutions that can be applied in varying conditions. Meanwhile, gas developers need to be able to predict and control capital spending, while maximizing the value of their natural gas and natural gas liquids (NGLs). The solution: Honeywell UOP modular equipment.

Modular Equipment –The Solution for Gas Processing

UOP provides solutions for your gas processing project, including shop fabrication, construction management, startup, and operations. We offer a range of solutions to best meet your gas processing needs – from straightforward dew pointing operations, to maximum NGL recovery.

Modular Design for Reduced Costs and Predictable Timelines

Our modular gas processing plants are factory-built using a unique design and construction approach that allows for quick fabrication and superior quality control. Due to pre-fabricated construction, your plant can be shipped by truck – even to remote locations. Upon delivery to a prepared worksite, the equipment is ready to install. Modules are designed to fit together rapidly, significantly reducing site construction time, expense and associated delays.



Helping Customers Increase Profits:

- Proven, best-in-class UOP modular gas processing plants
- Quickly achieve maximum processing capacity and recover valuable NGLs
- Designed to get you on-stream months faster and at a lower installed cost than stick built solutions, resulting in faster cash flows and better returns
- UOP is your single source for natural gas processing plants, helping you reduce handoffs and increase efficiency at every step

Benefits of the UOP Modular Approach:

- Reduce time to startup
- Improve project execution
- Predictable schedules and costs
- Reliable and proven operations
- Simplified maintenance and training
- Ongoing technical support

Gas Processing Solutions

Since the 1950s, UOP has provided technologies to condition, treat and upgrade natural gas, enabling customers around the globe to monetize their resources. UOP has completed more than 515 new modular gas units with a combined capacity of more than 40 BCFD of natural gas per day. These companies chose the benefit of reduced installation time, lower capital costs, superior performance, and a faster return on investment. The following modular gas processing plant components are available from UOP.

Acid Gas Treatment

UOP's flexible solutions help remove harmful acid gas from natural gas streams and improve overall performance. These solutions include UOP amine process plants, adsorbent technologies and UOP Separex™ membrane systems – available with enhanced membranes to increase hydrocarbon recovery and capacity.

Dehydration

Effective dehydration is critical to avoid unplanned shutdowns, costly equipment repairs and hazardous working conditions. Industry leading UOP MOLSIV™ adsorbents combine to simultaneously remove water and contaminants from the gas stream, protecting downstream equipment and reducing operating costs.

Mercury Removal

Even at low levels, mercury in natural gas poses a threat to the structural integrity of your equipment. UOP offers HgSIV™ regenerable molecular sieve adsorbents and non-regenerable metal oxide adsorbents to remove mercury from natural gas, LPG and other light hydrocarbon streams.

NGL Recovery

UOP's cryogenic turboexpander, mechanical refrigeration, and adsorption plants are designed to maximize the recovery of valuable NGLs from the gas stream, and remove heavy hydrocarbons according to the project objectives.

Dew Pointing

Honeywell UOP offers mechanical refrigeration systems and UOP SeparSIV™ system for heavy hydrocarbon removal. Dew pointing helps avoid downstream equipment operability issues associated with condensation and liquid slugging, and controls gas heating value.

NGL Fractionation

UOP fractionation systems provide further separate ethane, propane, butane, isobutane and natural gasoline products from mixed natural gas and liquid streams.

Sulfur Recovery

Downstream product specifications often require the processor to remove sulfur from the natural gas and liquid streams. UOP provides sulfur recovery systems based on Claus technology with tail gas recovery as well as Merox process technology for extraction of mercaptan from LPG streams.

The Honeywell Advantage

The Honeywell Advantage can deliver more sustainable value to our clients throughout the facility life cycle. Smart process technology and equipment from Honeywell UOP combined with advanced automation from Honeywell Process Solutions delivers faster, more sustainable value throughout the facility lifecycle. Your modular gas plant can benefit from comprehensive industrial security, fire and gas safety solutions and total metering solutions for gas and liquids. The benefits of the Honeywell Advantage include:

Starting Up Your Facility Sooner

- Pre-engineering completes automation by 30-40% before project starts
- Fully integrated UOP critical control applications
- Startup competency programs
- Eliminate delays with single-technology platform

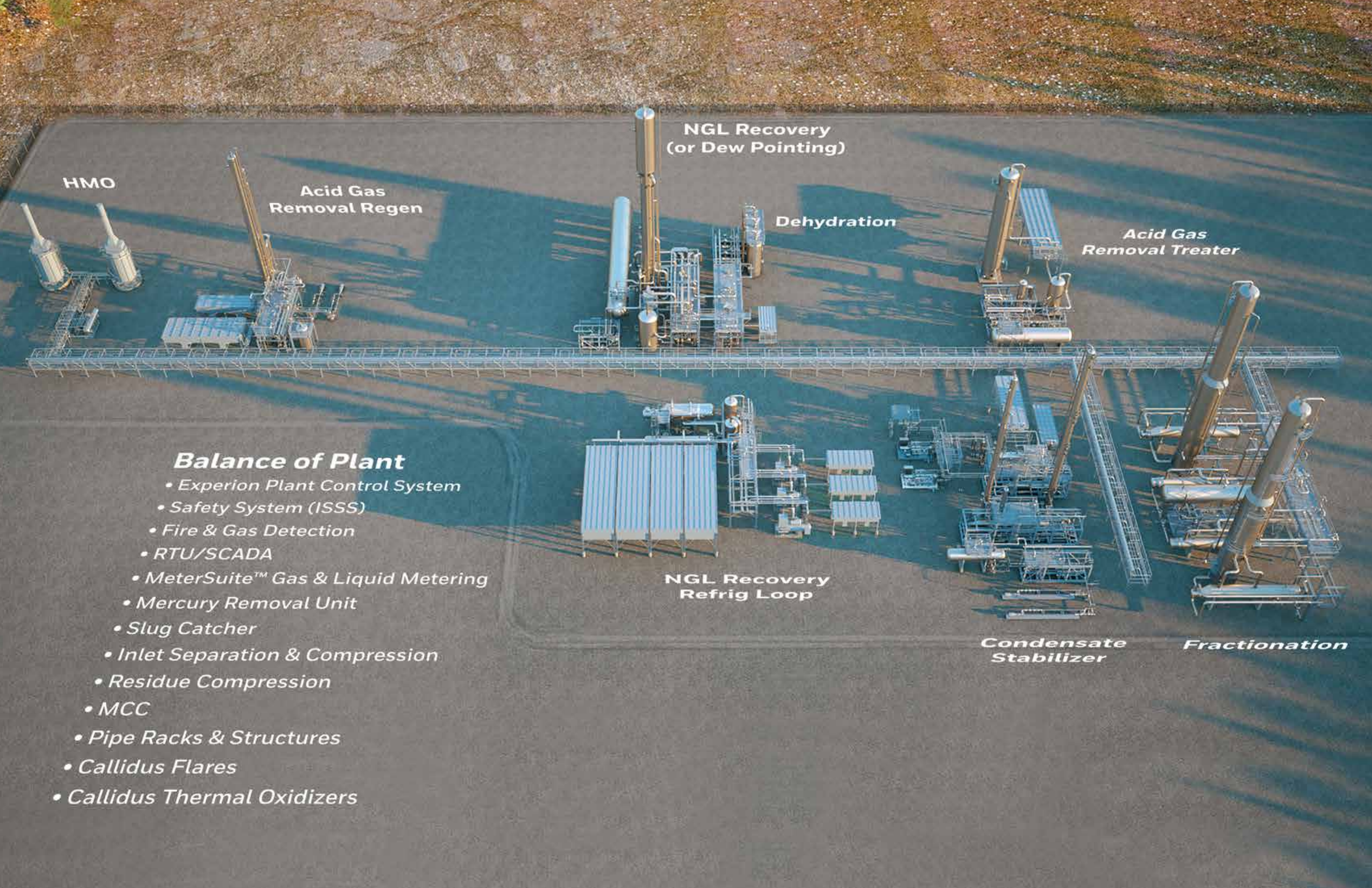
Reaching Target Production Faster

- UOP's design and operational expertise captured in HPS Platforms
- UOP process captured in ASM-compliant graphics
- Pre-configured alarm help
- UOP best practices included

Operating at Peak Performance

- Embedded process knowledge in APC for optimized production
- Locally delivered global excellence
- Long-term customer support
- Apps to enhance safety, productivity, and reliability





HMO

**Acid Gas
Removal Regen**

**NGL Recovery
(or Dew Pointing)**

Dehydration

**Acid Gas
Removal Treater**

Balance of Plant

- Experion Plant Control System
- Safety System (ISSS)
- Fire & Gas Detection
- RTU/SCADA
- MeterSuite™ Gas & Liquid Metering
- Mercury Removal Unit
- Slug Catcher
- Inlet Separation & Compression
- Residue Compression
- MCC
- Pipe Racks & Structures
- Callidus Flares
- Callidus Thermal Oxidizers

**NGL Recovery
Refrig Loop**

**Condensate
Stabilizer**

Fractionation

Modular Plant Case Studies

Situation: A natural gas provider needed to expand capacity quickly to meet growing supply needs. As explained by the customer, a single train, stick-built design would have taken months longer and first gas would have been delayed until enough capacity was available to commission a larger plant. The natural gas provider risked losing the opportunity to use short term cash flow to pay for future growth.

Solution: Honeywell UOP delivered a multi-train, pre-engineered modular gas processing plant, which enabled the customer to complete construction and expand capacity in less time than with a stick-built design.

Results: The project was completed on time and within budget due to the fast and reliable modular, pre-engineered gas processing plant. The UOP modular plant allowed for the rapid capture of additional business opportunities by expanding to multiple trains for processing and fractionation. The customer improved their returns by an estimated \$2-5 million USD for every additional day that each train of their plant was up and running.

Situation: A customer with natural gas containing high levels of valuable natural gas liquids (NGLs) was seeking the most economical way of recovering the liquids while producing pipeline quality residue gas. The customer sought to minimize project risk through a proven high recovery cycle provided by an experienced supplier.

Solution: Honeywell UOP delivered an integrated modular solution including its Slug Catcher, Stabilizer, Inlet Compression, Amine Gas Pretreatment, Cryogenic NGL Recovery Plant and NGL Storage Tanks.

Results: Honeywell UOP delivered the full modular equipment scope on time and within budget, enabling fast startup, low delivered capital costs, high up-time and low maintenance costs.



Dedicated aftermarket support

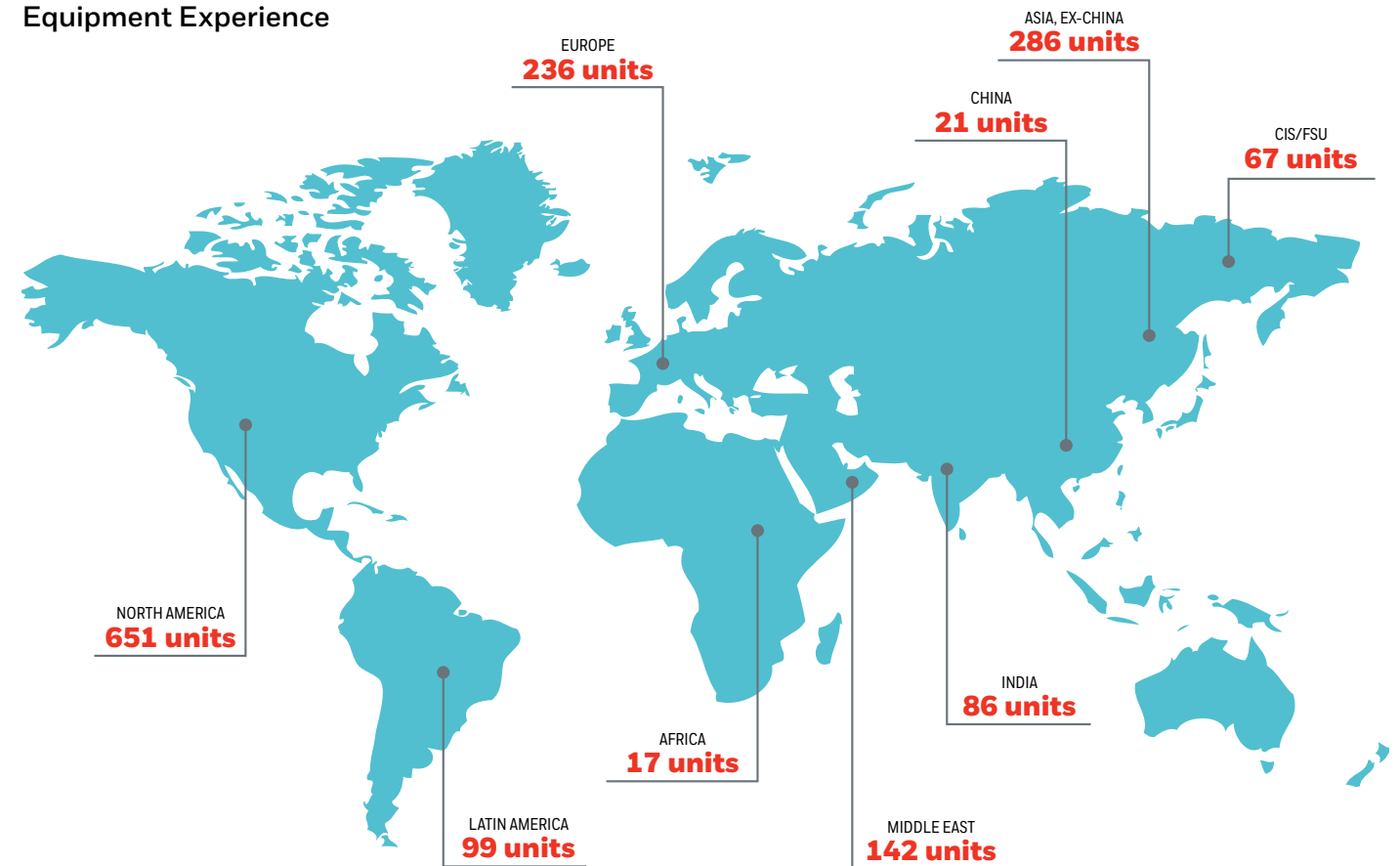
From start to finish, our global sales, engineering, service and support staff is there to understand your goals and ensure your needs are met with proven products and technology. Our dedicated customer support organization addresses your aftermarket needs, including debottlenecking and capacity increases, process performance improvement, hardware upgrades, operations training and field support supervision. Our extensive service offerings, coupled with our unmatched technical knowledge and experience, can help you focus on profitability.

With extensive installations around the world, UOP has the field experience and technical expertise to service plants that are dependable, safe and easy to maintain – for all your gas processing needs.

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. UOP has a global modular equipment base of more than 1,600 units installed, including over 515 modular gas units, and provides a full range of technical services and support.

Global Modular Equipment Experience





For more information

If you are interested in learning more about UOP modular systems, please contact your UOP representative or visit us online at www.uoprussell.com

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