AG&P introduces two new standardized modular regasification technologies that allow lower cost, hybrid LNG import terminals to be configured

Will meet needs of wider range of small-, mid-scale customers with greater flexibility, increased efficiencies and improved emissions

Barcelona, September 17, 2018: Atlantic Gulf & Pacific Company (AG&P), a global leader in industrial infrastructure and gas logistics, has added two more proprietary technologies to its suite of LNG import terminal solutions that will meet the needs of a wide range of customers by matching capacity with demand while minimizing upfront capital expenditure.

Speaking at Gastech 2018, Nancy Ballout, Vice President Process Engineering and Operations, AG&P, said that application of the new technologies to regasification modules would help provide commercially compelling solutions and therefore options for customers to access gas.

Water-bath type vaporization (WBV) technology

AG&P has developed a standardized WBV technology that utilizes fire tubes to transfer heat to a bath of water by convective and conductive heat transfer. The combustion gas never directly contacts the water. To minimize emissions and improve efficiency, the design can also include low NOx burner technology and a waste heat recovery economizer providing high efficiency without the complexity associated with other systems.

The benefits of this unique design are:

- Flexible: suitable for offshore and onshore applications where space is limited
- Adaptable: ideal for cold climate and environmentally regulated sites, including sites where an open loop system utilizing seawater is not feasible
- Efficient: comparable to submerged combustion vaporizers (SCVs) normally used onshore in cold climates but designed to be used in offshore/floating applications
- Value-adding: ensures a highly competitive footprint that maximizes space and assets

Fan ambient air vaporization (FAV) technology

AG&P has also developed an advanced and highly cost-efficient FAV technology for sub-tropical and tropical locations with ambient air temperatures greater than 15°C with adequate available space. AG&P's FAV technology offers a significant improvement as it simplifies the design of the regasification train, its operations and maintenance.

The unique benefits are:

- Reduced size: AG&P's FAV regasification trains have been carefully designed to minimize size and complexity, allowing for a faster build and easier installation
- Flexible: the technology enables the module to be split into two or stick-built and installed onsite, making it suitable for sites that cannot be accessed with a single, pre-fabricated module
- Optimized operations: a suite of integrated features that maximize space, improve flow and increase utilization to improve overall operational efficiencies

"These two new technologies complement AG&P's water-glycol shell and tube (STV) standard technology for regasification modules, which was introduced in 2017. All three technologies use the right combination of onshore and offshore assets, that can be scaled to meet current demand with the flexibility to expand to match future growth and investment," said Ms. Ballout.

"Our technologies allow us to configure hybrid terminals which is extremely cost-effective and allows for installation in locations that are currently constrained or inaccessible. Modularization ensures faster fabrication and easier transportation, so facilities are up and running sooner."

The three technologies will be deployed at AG&P's LNG import terminal at Karaikal Port in India and at two facilities currently under development in Latin America.

Table 1: *Comparative benefits of AG&P's three regasification technologies*

Comparison Factor	FAV	STV	WBV
Heating medium	Air	Glycol-water / seawater	Hot waterbath
Regasification technology	Direct vaporization with air	Indirect vaporization with glycol-water as intermediate fluid heated with seawater	Indirect vaporization with waterbath heated with submerged combustion firetube and waste heat economizer
Nominal capacity (standard module)	125 MMSCFD	125 MMSCFD	125 MMSCFD
Vaporizer required utilities	Electrical power	Electrical power, glycol water, seawater	Electrical power, fuel gas
Single train module envelope (L x B x H)	146' x 46' x 53'	54' x 37' x 35'	68' x 70' x 43'
Advantages	• Provide full vaporization duty with no supplemental heating in warmer climates (~20^{0}C and above) • Simple operation and maintenance • Ability to recover chilled water; no seawater required; minimum air emissions	• Provide vaporization duty with use of "available" heat from seawater • Minimum air emissions	• Smaller footprint when plot space is limited • Optimize energy usage with waste heat recovery • No seawater required • Ultra low NOX burners

#

Media contact:

AG&P
Dianne Elaine Ozaeta-Perez
Manager, Marketing & Communications
Phone: +639989665839
dianne.ozaeta@agp.ph

About AG&P

AG&P is a global industrial infrastructure company with world-leading credentials across three lines of business: Gas Logistics (LNG supply chain design, development and marketing); Modular Construction; and FieldCOM (manpower services and site works). Founded in 1900, we have successfully served blue-chip clients on some of the world's most demanding infrastructure projects.

AG&P has global presence, with strong local teams on the ground serving clients in the Philippines and across Southeast Asia, North Asia, Australia, North America, Latin America and GCC markets. Our high standards of health, safety and professional ethics are maintained through a rigorous companywide compliance program and a deeply-rooted HSEQ culture at every level within the organization.