



Oil & Gas

PROVIDING COMPREHENSIVE OFFERINGS, PROVEN PERFORMANCE
AND CONSISTENT VALUE

BUILDING A WORLD OF DIFFERENCE®
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BLACK & VEATCH

Leadership and Proven Performance

Black & Veatch is a global leader specializing in gas processing, sulfur recovery, gasification and liquefied natural gas (LNG) technologies.

Black & Veatch's comprehensive offerings from conceptual studies to turnkey construction solutions, backed by our proven performance in safety, reliability and environmental considerations, deliver consistent value on every project we undertake.

Our industry leadership includes proprietary technologies for liquefaction of natural gas, extraction of natural gas liquids from LNG, liquefied petroleum gas (LPG) recovery, sulfur degassing, conversion of sulfur to power and LNG vaporization. With more than 3,000 assignments in more than 40 countries, we have a proven performance record in safety, reliability and environment enhancement, while demonstrating our innovative execution capabilities.

GAS PROCESSING

Black & Veatch is a global leader in all aspects of natural gas processing — from sour gas treating and sulfur recovery, to natural gas liquid (NGL) recovery and fractionation. Our world-scale projects have reached 2 billion cubic feet per day. With Black & Veatch you are ensured an optimized process design that enhances every aspect of plant life cycle cost — plant operability and flexibility, minimum operating cost and maximum product revenues — all balanced with capital cost.

Our suite of technologies (PRICO-C2®, PRICO-EX®, PRICO-NGL® and LPG-PLUS®) can be used to efficiently recover high levels of ethane and/or propane from a variety of feed gases including shale gas, natural gas and various refinery off-gas streams.

Our overall gas processing experience includes:

- **Acid Gas Removal.** More than 100 projects including both chemical and physical solvents.
- **Dehydration.** More than 100 projects including both glycol and molecular sieve.
- **NGL Recovery.** More than 75 projects for both ethane and propane recovery.
- **NGL Fractionation.** More than 20 projects with unmatched operating flexibility and energy efficiency.

LNG PRODUCTION

For safe, efficient and economical solutions in LNG production, we bring it all together. In the early 1960s, Black & Veatch was an industry pioneer, involved in one of the world's first LNG facilities in Algeria. Since then, we have helped design and build numerous base load, peak shaver and LNG storage facilities.

With Black & Veatch, you tap into global LNG project experience that ranges from 4 million standard cubic feet per day (MMSCFD) to over 180 MMSCFD. Our PRICO® LNG process is ideal for producing LNG for peak shaving, vehicle fuel, gas distribution systems and offshore application.

Advantages of this process include:

- **Economy.** The lowest capital cost of all competing technologies.
- **Simplicity.** Single refrigeration system needs minimum number of equipment items and has a simplified control system.
- **Flexibility.** Permits variation in feed gas composition and conditions, as well as LNG product.
- **Ease of Operation.** Allows for rapid startup and shutdown with minimal downtime.
- **Reliability.** Proven operation; requires fewer operating personnel.
- **Optimized Costs.** Streamlined process design minimizes equipment and space requirements.

LNG EXPORT/IMPORT TERMINALS

LNG export/import terminals and FLNG are the links between the world's natural gas reserves in one area and the growing need for economical and environmentally friendly energy in another. It is a link that Black & Veatch has been building and strengthening since our involvement in the first LNG terminal built in Korea. Since then, we have helped design and build numerous LNG-related facilities including:

- First terminal integrating LNG vaporization and power generation.
- First offshore LNG terminal design for the U.S. Gulf of Mexico.
- First FLNG Project in the World

Our technical and mechanical design expertise encompasses:

- LNG storage tanks.
- LNG unloading systems.
- Low-temperature equipment and materials.
- Heat exchange equipment.
- Low-temperature instrumentation.
- Low-temperature insulation.
- Cryogenic piping.
- LNG pumping.
- Boil-off gas systems.

With Black & Veatch, you tap into direct experience gained from more than 16 terminal projects, ranging from 200 MMSCFD sendout to more than 2.08 billion SCFD sendout.

Photo: EXMAR FLNG Project



AMMONIA, METHANOL, SYNFUELS AND SYNGAS

Conversion of abundant, low-value carbonaceous resources (biomass, coal, heavy oil, natural gas, oil sands, oil shale and petroleum coke) to high-value chemicals and fuel is an attractive replacement for expensive crude oil. Black & Veatch performs feasibility assessments for the production of ammonia/urea/urea ammonium nitrate, methanol, syngas and synfuels (diesel, jet fuel and gasoline) including selecting the best technology for specific feed and product requirements. Following technology selection, Black & Veatch provides design and EPC services.

We have experience in the design of natural gas reforming and liquid and solid gasification plants to produce hydrogen, ammonia, methanol, synthetic natural gas and transportation fuels.

Our design experience includes complex process configurations, multiple products and multiple technologies. Our expertise in syngas and acid gas processing, sulfur recovery, material handling, power generation, power delivery and water treatment allows Black & Veatch to provide complete feasibility to EPC project services.

Our ammonia process team specializes in revamps to increase capacity and energy efficiency. Black & Veatch will develop the best revamp flow sheet and EPC execution plan to meet your needs.

SULFUR RECOVERY

In sulfur recovery, the goal is always more — broader processing capability, greater unit efficiency, maximum sulfur recovery and maximum on-stream time.

From our people to our processes to our technologies, Black & Veatch brings it all together for performance that delivers at every level:

- Lowest-cost facilities.
- Highest operating reliability.
- Greatest operating flexibility.
- Proven process performance.
- Excellent operating plant references.
- Ongoing technical support.

Black & Veatch is a world leader in the design and construction of sulfur recovery units and related sulfur management facilities, backed by a reputation for delivering long-term value to clients. Our concept-to-construction experience covers the complete range of sulfur recovery applications, including gas/liquid treating systems, sour water strippers and flue gas desulfurization units. Total sulfur production of Black & Veatch-designed units now exceeds 47,000 long tons per day (LTPD). From conceptual process design to optimum selection and configuration, we excel in developing process designs that incorporate the best-fit technology to meet our clients' needs. We also offer full-scope engineering, procurement and construction (EPC) services for the construction of new facilities or the revamp of existing facilities, with a record of on-time, on-budget project delivery.

Let's get started. bv.com/contact-us