



**TOTAL MIDSTREAM
SOLUTIONS IN GAS
PROCESSING/TREATING AND
CRUDE OIL HANDLING**



COMPLETE ENGINEERED SOLUTIONS

BCCK ENGINEERING COMPLETE ENGINEERED SOLUTIONS

BCCK Engineering, Inc. is an internationally recognized natural gas engineering company specializing in nitrogen rejection, NGL recovery, CO₂ removal, helium recovery and oxygen removal. As a leader in natural gas processing and treating and oil handling, BCCK Engineering helps gas producers generate revenue from previously by-passed or contaminated reserves. Serving the energy industry worldwide, BCCK helps gas producers significantly enhance their bottom line by providing engineering capability and project management expertise – electrical, civil, mechanical, automation, and chemical – fitting the right technology to the right application to efficiently optimize gas processing solutions.

BCCK
ENGINEERING
HELPS
GENERATE
REVENUE



BCCK has delivered some of the most unique gas processing/treating solutions in the world, including processing of fire flood associated gas, coal mine methane, and CO₂ flood associated gas. BCCK's patented gas processing and proprietary technologies have a history of providing the best overall economic and technical solutions for clients.



FULL EPC PROJECTS

BCCK Engineering has a successful history of providing full EPC (engineering, procurement and construction) projects. Our success is due to our ability to offer, through BCCK's three divisions, a full array of services including engineering, design, fabrication and on-site construction. In addition, we can install your "off-the-shelf" processing and treating equipment and provide the balance of plant implementation with our full EPC capability.

Our full EPC project experience includes the following services:

- Process Engineering (Design and modeling)
- Electrical Engineering, including:
 - o Power system modeling and design
 - o Short circuit, load flow and arc flash studies
 - o Distribution gear (transformers, switchgear, motor controls) specification and procurement
 - o Power distribution center specification and procurement
 - o Facility lighting
- Control system design (PLC or DCS) and programming (including HMI)
- Instrumentation, analyzers and metering specification and procurement
- Gas and fire detection
- Full FEED studies up to FEL 3
- P&ID development and integration
- Mechanical Engineering, including:
 - o Rotating equipment specification and procurement
 - o Valve sizing and specification
 - o Pipe stress analysis
 - o Line sizing and specification
- Civil engineering (site grading, structural steel and concrete design)
- Project Management: including procurement, expediting, and project tracking
- Document control
- Inventory control
- Civil and mechanical design (3D)
- Site layout (including plot plans and area classification) per recognized industry codes and standards
- PHA participation
- Commissioning and startup assistance
- Relief system sizing and design per recognized industry standards
- ASME code vessels, piping and skid fabrication (via NG Resources)
- On-site civil, mechanical and I&E construction services (via NGF Construction)



FULL
ENGINEERING,
PROCUREMENT
&
CONSTRUCTION

TURBO EXPANDER PLANTS

BCKK provides high efficiency turbo expander plants utilizing the latest proven technology to improve project economics over typical off-the-shelf designs. Our designs include high-ethane recovery for the richest inlet gas streams, as well as maintaining high propane recovery in ethane rejection mode at a competitive price with respect to other standard designs. With our experience, BCKK can offer a competitive option while providing a facility that meets your specific product requirements with optimized efficiency.

Our turbo expander plants help improve project economics by delivering a facility that does not require you to compromise on throughput or recoveries for your specific conditions. BCKK can draw from our resume of turbo expander plant projects and designs or provide custom engineered solutions with competitive pricing (from contract to start-up). BCKK's solutions and proven process designs will meet a wide range of conditions and can be tailored for your specific project. As a result, our processes will result in higher efficiencies, greater recoveries, and

more operating flexibility across a wider range of inlet gas flow rates and concentrations. With these facilities we can offer the highest ethane recovery (99%+) technologies on the market. In addition, our facilities are designed to maintain high propane recoveries (98%+) during ethane rejection.

This maximizes revenue in both operating modes and provides operational flexibility that does not exist with the typical off-the-shelf designs available in the market.

In addition to specializing in full EPC projects and turbo expander plants, BCKK also provides additional services including:

- Nitech™ nitrogen rejection
- Helium recovery
- CO₂ removal
- Acid gas removal
- TEG dehydration
- Mole sieve dehydration
- Propane refrigeration
- Inlet gas chilling or dew point suppression
- Condensate separation/stabilization
- Flare systems
- Product storage
- Inlet separation and metering
- Compression
- NGL product fractionation
- PDCs, MCCs and electrical power distribution
- PLC and DCS control systems

HELP
IMPROVE
PROJECT
ECONOMICS



BALANCE OF PLANT/FULL EPC

BCKK, along with our sister companies, can provide the balance of plant with full engineering and construction support to install equipment you own. Whether that be a new standard cryo plant, crude oil stabilization, condensate stabilization, dehydration, compression, etc., we will be glad to work with you to provide the balance of equipment, along with installation, so that you can ensure that you have a fully integrated and well-engineered solution that meets your needs. BCKK, along with NG Resources and NGF Construction, have extensive experience installing facilities that include standard equipment supplied by others or owned by our clients.



BCKK,
NG
RESOURCES
& NGF
CONSTRUCTION
PROVIDE
BALANCE

NITROGEN REJECTION

BCCK's nitrogen rejection experience and success utilizing the Nitech™ Nitrogen Rejection process is unmatched in the gas processing industry. Over the past 25+ years, this experience includes nitrogen floods, fire floods, coal mine methane projects, and naturally occurring low-BTU gas streams including low nitrogen applications (< 10.0 mole %). BCCK's patented Nitech™ technology enables producers to profitably recover once by-passed reserves to create new revenue streams and reduce negative environmental impact. Regardless of the nitrogen content, Nitech™ NRU can also increase project profitability by incorporating our proven NGL extraction and helium recovery with the Nitech™ process.

The Nitech™ NRU technology is an economical, effective, environmentally friendly and highly efficient process to remove nitrogen from inlet flow rates as low as 5 MMSCFD to rates in excess of 275 MMSCFD. With a minimal number of components and no requirements for cryogenic rotating equipment, the Nitech™ NRU delivers

the efficiency of traditional cryogenic process, typically in excess of 99%, with a less complex, more reliable and lower cost design.

RECOVER
ONCE BY-
PASSED
RESERVES



LOW N₂ APPLICATIONS (< 10.0 MOLE %)

With pipelines clamping down on nitrogen specifications, there is a growing need to remove nitrogen from previously marketable gas streams that contain relatively low nitrogen content but greater than the pipeline thresholds of 2.0 to 3.0 mole %. Because of the proven flexibility of the Nitech™ process, these low N₂ applications are a great fit for the Nitech™ process. The Nitech process is more competitive for Low N₂ scenarios since nitrogen is not a required refrigerant and the operating cost of recycle is not required to meet a minimum inlet nitrogen content.



NITECH™ BENEFITS

- Proven over a wide range of conditions
- Low capital cost – minimal process equipment and no cryogenic rotating equipment
- Flexible design allowing a wide range of inlet conditions
- Low power consumption
- Non complex process design requiring minimal operator attention
- Small footprint due to minimal equipment
- Low compression requirements
- CO₂ tolerant – no processing required beyond the capability of readily available amines
- Nitrogen contents from 3 to 90% reduced to as low as 1%
- High efficiency – hydrocarbon recovery typically in excess of 99%
- Environmentally friendly – emits no non-methane VOCs
- Quick restart after short shutdowns (Power outage, compression shutdown, etc.) Comes on-line and on-spec
- Integrated NGL extraction with high NGL recovery options
- Integrated helium recovery



MOST
NATURAL GAS
FACILITIES
NEED SOME
TYPE OF NGL
EXTRACTION



NATURAL GAS LIQUIDS (NGL)

There is a great opportunity for nitrogen rejection with multiple integrated NGL extraction options, and specifically high NGL recovery. Since the Nitech™ process is a cryogenic process that operates much colder than typical cryogenic NGL extraction plants, integrating NGL extraction can be done to meet even the most stringent recovery requirements. Today, with higher liquid product values, it is more important than ever to integrate NGL extraction that has high NGL recoveries.



Most natural gas facilities need some type of NGL extraction in order to meet pipeline specifications. Many of BCCK's installed Nitech™ NRUs utilize some form of integrated NGL extraction. By integrating NGL extraction with the Nitech process, capital costs can be minimized without sacrificing recoveries.

CO₂ REMOVAL

In today's emerging market there is an increasing need for economically viable processing of high CO₂ streams, whether from naturally occurring streams or from CO₂ flood projects. BCCK's technology and experience in processing high CO₂ meets those needs.

BCCK incorporates a variety of processes for the extraction of CO₂ from natural gas streams and has developed technologies to economically process high CO₂ streams where it is important to sequester CO₂. With BCCK, clients can minimize capital expenditures and operating costs with our ultra-high CO₂ sequestration and CO₂ removal processes.

BCCK Engineering's CO₂ technologies provide the most efficient and cost-effective means of handling high CO₂ gas. Our experience includes using membrane-based CO₂ removal, CO₂ removal by fractionation and the use of refrigerated MeOH to provide a stream with very low CO₂ concentrations to allow further cryogenic processing or for feed to an LNG facility without the concern for CO₂ freezing.



BCCK can help operators increase revenue from CO₂ rich reserves by:

- Purifying natural gas into a sellable product
- Creating a high-quality CO₂ product for resale or reuse
- Separating NGLs for sale



HELIUM RECOVERY

Operators with higher concentrations of contamination in gas feed streams have discovered BCCK's economical, reliable solution to purify their gas while generating additional revenue from the separated and processed by-products.

Helium is a rare and premium priced commodity that is in high demand. BCCK's proven helium recovery units (HeRU) are generating significant revenue for operators in today's market that are far greater than that of similar volumes of natural gas. Integrated with the patented Nitech™ system, with minimal additional equipment, BCCK's proven Helium recovery system provides a crude-grade helium product with a 99 percent plus helium recovery rate.



A VARIETY OF
PROCESSES
FOR THE
EXTRACTION
OF CO₂

A RARE AND
PREMIUM
PRICED
COMMODITY

OXYGEN REMOVAL

After developing the Nitech™ process, BCCK began to secure projects utilizing the Nitech™ NRU technology. One area of application was the processing/treating of coal mine methane (CMM). CMM presented a unique challenge to BCCK in that it contained appreciable amounts of oxygen, which had to be removed for safety reasons and to meet pipeline specifications. BCCK successfully developed a proprietary oxygen removal process with our first CMM project and has continued to have success with the technology today.

BCCK's oxygen removal process has been employed at CMM facilities as well as with more traditional gas processing projects. While oxygen is not typically found in natural gas, the presence of oxygen can be found due to low pressure gathering. In this case, it may not be feasible to prevent the introduction of oxygen so BCCK's oxygen removal can be used to reduce the oxygen to acceptable levels.



Benefits of BCCK's Proprietary Oxygen Removal:

- Proven technology
- Removes oxygen to less than 10 ppmv meeting the most stringent pipeline specifications
- Can be integrated with other systems in the plant to improve overall efficiency

ENGINEERING IS OUR PASSION; SAFETY IS OUR LIFE

As our experts monitor every aspect of a project to ensure cost expectations and deadlines are met, safety is always a priority. Our staff receives frequent training to stay current on the latest safety and quality standards required in the natural gas industry.

Additionally, BCCK makes safety a priority with all staff members and requires unsafe behavior to be reported immediately to the on-site manager. It is BCCK's goal to provide cost-effective, safe and high-quality solutions to complex industry challenges.



**NITECH™
CONVERTS
WASTE INTO
A SELLABLE
COMMODITY**

**BCCK
MAKES
SAFETY A
PRIORITY**

