

Liquefaction of natural gas (LNG)

COSTAIN

Industry-leading cryogenic experience, delivering customised engineered solutions across the LNG value chain.

Challenges

Natural gas plays an increasingly important role in meeting today's energy demands. Whilst the majority of natural gas is delivered in its gaseous form, increasing global demand for natural gas has given rise to the use of gas in its liquefied form, leading to investments in cost effective onshore/offshore liquefaction facilities and receiving terminals.



“ Our design solutions and consultancy services provide low overall project cost, improved performance, simplicity of operation and increased safety and reliability. ”

Grant Johnson Front End Solutions Manager



✉ Grant.Johnson@costain.com
☎ +44 (0)1619103898

Grant has over 20 years' experience in the delivery of projects in international gas processing for onshore and offshore installations.

Our approach

Our capability covers a wide range of LNG solutions including baseload, small/mid-scale FLNG, bunkering, truck loading and vehicle fuel.

Our rich heritage in cryogenic gas processing enables us to offer a wide range of solutions for gas liquefaction, including nitrogen removal, upstream treatment processes (incorporating water, CO₂ and heavy hydrocarbon removal), and LPG recovery in LNG plants.

We have a portfolio of patented technologies which is continually extended to offer innovative solutions to our clients' needs.

We have developed a simple, reliable, low capital cost process for removing nitrogen from LNG to <1 mol%, enabling management of nitrogen in LNG flash gas streams and producing a pure nitrogen stream suitable for atmospheric venting.

Our services

- Feasibility studies, concept development and technology selection based on the most appropriate solutions and equipment.
- Specialist capability for front end design and detailed engineering.
- Comprehensive engineering assessments encompassing all aspects of plant design, performance and optimisation.
- We offer all types of liquefaction technology, including expander cycles, multi-stage mixed refrigerant cycles and cascade processes.

Benefits:

- Management of minor modifications on live plant, as well as major brownfield upgrades and complex greenfield developments.
- Design solutions with easy integration into new/existing plant, and low complexity, cost and footprint.
- Well proven liquefaction technology offering inherent safety and ease of start-up/shutdown operations.
- Our design solutions cater for varying feed gas conditions, high turndown rate and low energy consumption.

Example project experience

Flex LNG – Floating LNG production

Design of LNG facilities to produce in excess of 1.7 million tonnes per annum LNG, for the world's first FLNG FEED project, in conjunction with Aragon, specialist in FPSO topside solutions.

Solution

Conceptual studies, front end engineering and detailed design of specialist cryogenic plant and equipment using nitrogen expander liquefaction cycle technology.

Outcome

- Robust and flexible design with high liquefaction efficiency.
- Design solutions offering simplicity of operation, reliability and cost savings.

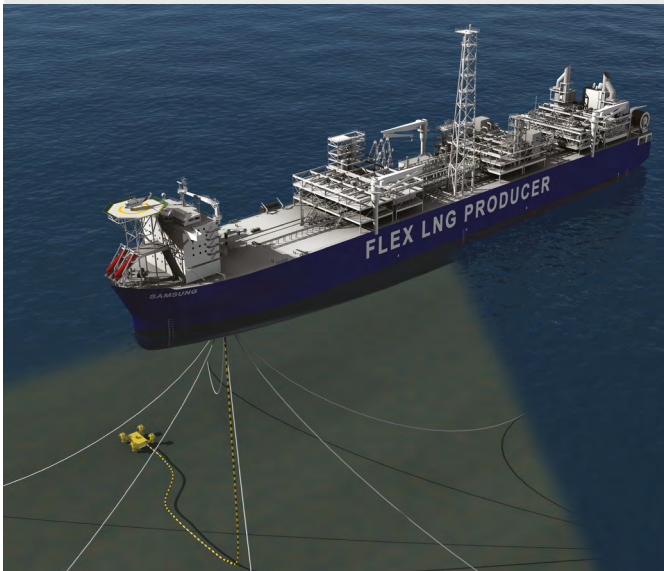


Image courtesy of FLEX LNG and Samsung Heavy Industry

RWE DEA, Egypt – Baseload LNG facilities

Techno-commercial evaluation of liquefaction technologies to identify improved options for future LNG trains at base-load Idku and Damietta LNG plants in Egypt.

Solution

Conceptual engineering, performance studies and due diligence assessments for the 7.2 million tonnes per annum Idku plant, and the 5 million tonnes per annum Damietta plant.

Outcome

- Independent review of third party technology for gas conditioning facilities upstream of the proposed LNG plant.
- Conventional proven design modified to meet high capacity at competitive cost.

Isle of Grain, UK – LNG import terminal

Conditioning of imported LNG to meet UK gas specification and design of process scheme identified from earlier conceptual study.

Solution

Engineering services encompassing front end engineering design, detailed design, procurement, installation, construction management and commissioning support.

Outcome

- Design of recondenser, integrated with nitrogen injection at the 3.3 million tonnes per annum gas processing terminal.
- Gas quality upgraded to meet National Grid's requirements and specifications.



GPA Midstream Association, Tulsa USA – Heavy hydrocarbon removal in LNG facilities

Removal of small amounts of heavy hydrocarbons upstream of LNG plant, including evaluation of hydrocarbon removal technologies.

Solution

Technical evaluation and conceptual studies, including identification of leading technologies for removal of gas lean in C3+ components, and for small to mid-scale LNG production facilities (*GPA midstream research report 234*).

Outcome

- Established design principles with robust, reliable performance and high liquefaction efficiency.
- Assessment provides technical guidance to designers and plant operators on optimal treatment of gas for liquefaction.