Engineering confidence into LNG projects

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The importance of early engagement with an experienced compressor OEM

As global demand for liquefied natural gas (LNG) continues to grow, so too does the complexity of the infrastructure required to support it. New terminals, plant expansions, floating storage and regasification units (FSRU), as well as carrier fleets are being developed at pace across the world. In Europe particularly, LNG has become a cornerstone of energy security, prompting accelerated investment in import terminals and storage capacity. However, the success of LNG infrastructure depends not only on the technologies selected, but also on the expertise applied during their integration and execution.

Besim Fejzuli, Senior Product Manager with Burckhardt Compression, explains the importance of engaging a compressor manufacturer that also offers support in planning and delivery of a new installation.

Among the most essential systems in any LNG facility are boil-off gas (BOG) compressors. These machines play a crucial role in capturing and reprocessing gas that naturally evaporates from cryogenic storage tanks. Without reliable compression systems, valuable product would be lost, safety margins would narrow and operational efficiency would suffer. BOG compressors therefore operate at the heart of LNG plants, terminals and carriers, continuously managing gas streams under demanding and highly variable conditions.

Lifecycle management

While compressor technology itself is essential, the true factor in determining project success lies in how these systems are engineered, installed, commissioned, and supported over their lifetime. Increasingly, LNG asset owners are recognizing that selecting a compressor model is only a small part of the equation. The capabilities of the original equipment manufacturer (OEM), particularly their ability to engage early in the project lifecycle and manage complex engineering requirements, are equally decisive factors.

For LNG operators seeking reliability and long-term value, engaging an experienced compressor OEM at the earliest stages of a project can significantly reduce risk and improve future benefits. This approach helps ensure that compression systems are designed not merely as standalone machines, but as fully integrated components of a broader process environment.

BOG compressors occupy a unique operational position within LNG facilities. They operate continuously, often under demanding duty cycles, and are responsible for handling gas streams that represent both economic value and process stability. Any disruption to BOG compression can have immediate operational and financial consequences, particularly in facilities where storage and processing systems are closely interconnected.

Process understanding

Unlike many industrial machines that can be selected from standard product lines, LNG BOG compressors are typically engineered to order. Each installation presents its own combination of pressure ratios, gas compositions, ambient conditions and spatial constraints. Factors such as humidity, elevation, temperature extremes, and facility layout can all influence compressor performance. These variables also affect vibration behavior, noise levels, materials selection and long-term mechanical reliability.

As a result, successful compressor deployment requires a holistic engineering approach. Asset owners benefit from working with OEMs that possess a deep

understanding of the entire LNG process chain, including the interfaces between storage tanks, pipelines, process units and downstream systems. Only by considering the compression system as part of the wider facility can engineers ensure stable and efficient operation.

One of the most important differentiators between compressor suppliers is the timing and depth of their involvement in the project. Leading OEMs engage with customers long before a purchase order is placed, contributing application engineering expertise during conceptual design and front-end engineering design (FEED) phases. This early collaboration enables project teams to identify potential challenges while design changes remain relatively simple and cost-effective.

Early design assessments

During these initial stages, experienced compressor specialists can assess layout constraints, piping configurations, foundation requirements and vibration sensitivity near critical structures such as LNG storage tanks. Regulatory requirements and regional standards can also be addressed early in the design process. By identifying these considerations well in advance, project teams are able to resolve issues proactively rather than reacting to complications during construction or commissioning.

This collaborative planning process becomes particularly valuable in Europe, where LNG terminals are often located in densely developed industrial zones or coastal areas with strict environmental and regulatory frameworks. Early involvement by the compressor OEM ensures that design solutions align with local codes, noise limits and safety expectations, helping project developers avoid costly redesigns or delays.

Working closely with engineering, procurement and construction (EPC) contractors as well as asset owners, experienced compressor manufacturers can help ensure that installation strategies are practical and that commissioning timelines are

realistic. Such coordination reduces the risk of schedule disruptions while improving cost efficiencies throughout the project.

Tailored designs

Engineering discipline is at the core of effective LNG compression project management. While certain components of reciprocating compressors can be standardized, critical elements such as compressor cylinders must be tailored to each specific application. Parameters including pipeline pressure, temperature, gas flow requirements and operational flexibility all influence cylinder sizing and configuration.

These technical distinctions are not merely theoretical considerations; they directly affect plant performance. An off-the-shelf compressor may satisfy some operating parameters, but it rarely meets all requirements simultaneously. In contrast, engineered-to-order (ETO) compression systems are designed to meet the precise performance indicators defined by the facility. This includes compliance with vibration limits, noise constraints and operational turndown requirements.

Customization becomes even more important when compressors are installed near LNG storage tanks or other vibration-sensitive equipment. In such situations, system-level engineering is essential. Pulsation analysis, mechanical design and noise control measures must all be carefully evaluated to ensure that plant specifications and regulatory limits are respected. Without this level of integrated engineering expertise, facilities may face unexpected operational challenges after commissioning.

Key expansion projects

The importance of strong project management becomes even more evident when LNG infrastructure is expanded or modernized. Across Europe and other mature markets, many current projects involve the extension of existing terminals rather than entirely new builds. Expansion projects introduce additional layers of

complexity, including restricted installation space, integration with existing systems and the need to maintain uninterrupted plant operations during construction.

For operators, the stakes are high. Shutting down an LNG terminal or reducing its throughput during upgrades can carry significant economic consequences. This is why asset owners increasingly rely on compressor OEMs that possess not only technical knowledge, but also the operational experience necessary to plan installations that minimize disruption.

Early consultation allows project teams to align construction sequencing with existing plant operations. Temporary tie-ins, vibration considerations and noise mitigation strategies can all be planned in advance. In many cases, careful engineering enables compressor installations to proceed without requiring extended shutdowns, allowing facilities to maintain full capacity throughout the upgrade process.

Global reach with a local presence

Another critical factor in modern LNG projects is the combination of global expertise with strong regional support. LNG infrastructure operates within diverse regulatory environments and compliance with local standards is essential. At the same time, operators expect reliable access to spare parts, technical expertise and maintenance services throughout the lifetime of the equipment.

Compressor OEMs that combine global manufacturing capabilities with local service networks are therefore particularly valuable partners. Local teams can respond quickly to operational needs, while global engineering resources ensure consistent quality and adherence to internationally recognized standards.

Clear and consistent communication is equally vital to project success. LNG facilities involve multiple stakeholders, including asset owners, EPC contractors, regulatory authorities and equipment suppliers. Effective project managers maintain open

channels of communication across these groups, addressing issues early and ensuring that all parties remain aligned with project objectives.

Transparent communications

Modern digital tools are increasingly supporting this product development process. Advanced planning and reporting platforms allow project teams to monitor engineering progress, manufacturing milestones, testing schedules and supplier performance in real time. Shared dashboards provide transparency, helping customers understand the status of their equipment throughout production and delivery.

However, technology does not replace human accountability. Reliable OEM partners combine digital transparency with direct communication, ensuring that customers receive clear information and rapid responses to emerging challenges. Trust is built not only through data access but also through the consistent engagement of experienced project managers who remain responsible for delivering results.

In many LNG developments, asset owners choose to rely on their compressor OEM as a single-source partner. In these arrangements, the operator defines performance targets and commissioning deadlines while entrusting the detailed execution of the compression system to the supplier. Such partnerships demand strong governance structures and proactive project leadership.

Experience and long-term reliability

Not all compressor manufacturers possess the depth of expertise required to manage complex LNG projects at this level. Those that do draw on decades of engineering experience, combining standards-driven design practices with field-proven operational insights. Expertise in areas such as materials selection, vibration management and emissions performance plays a crucial role in ensuring reliable, long-term operation.

Within this context, the value of a compressor OEM with extensive LNG experience becomes clear. Companies such as Burckhardt Compression bring more than a century of compressor manufacturing expertise and decades of dedicated LNG application knowledge to every project. This depth of experience allows engineering teams to anticipate operational challenges, optimize system design and minimize product losses throughout the facility's lifecycle.

In addition to project delivery, long-term reliability depends on structured maintenance and service strategies. Planned maintenance programs, spare-parts availability and technical support ensure that compressors continue to operate efficiently over many years of service. For LNG operators, lifecycle support from the OEM provides confidence that performance standards can be maintained even as operating conditions evolve.

Effective and enduring solutions

Industry leadership also extends beyond individual projects. Experienced compressor OEMs often contribute actively to the development of international standards that shape best practices across the sector. Participation in technical committees and regulatory initiatives helps ensure that equipment design continues to meet emerging safety, environmental and efficiency requirements.

Ultimately, effective compression in LNG applications cannot be separated from effective project management. The complexity of LNG facilities, the value of the gas being handled and the operational consequences of downtime all demand a comprehensive approach. Asset owners require partners capable of delivering not only advanced machinery but also the engineering expertise, project governance and lifecycle support necessary to ensure dependable performance.

Early engagement, rigorous customization, transparent communication, global capability, and long-term service commitment define the qualities LNG operators should expect from compressor suppliers. When these elements come together,

compression systems become not simply pieces of equipment, but integral components of a resilient and efficient energy infrastructure.

For LNG developers and operators across Europe and around the world, partnering with an experienced compressor OEM from the earliest stages of a project can transform risk into confidence and complexity into operational success. Through disciplined engineering and comprehensive lifecycle support, companies such as Burckhardt Compression continue to help shape the reliable LNG infrastructure on which modern energy systems increasingly depend.

Image captions:

Image 1: Operators increasingly rely on compressor OEMs that possess technical knowledge as well as operational experience to deliver new installations.

About Burckhardt Compression

Burckhardt Compression delivers leading compression solutions that enable a sustainable energy future and support the long-term success of its customers. The Group's business is driven by three global megatrends: a growing global population, increasing demand for energy security, and the ongoing energy transition. With its highly engineered reciprocating compressor systems and services, Burckhardt Compression plays a vital role across applications such as hydrogen, gas infrastructure, chemical processing, and industrial gases.

Through its brands Burckhardt Compression, PROGNOST, SAMR Métal Rouge, Shenyang Yuanda Compressor, and Fornovo Gas, the Group offers a comprehensive portfolio of reciprocating compressor technologies, digital monitoring solutions, and lifecycle services.

Founded in 1844, Burckhardt Compression has continuously evolved alongside its markets, from early engineering innovations to today's advanced compressor solutions. Headquartered in Winterthur, Switzerland, the company operates globally with 35 subsidiaries, as well as three manufacturing and five assembly sites.

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