

## Case study

# Specifically developed and patented technology speeds construction of Freeport e-LNG plant

Our electric-system expertise helps customers achieve their targets for security, stability, and control. Our capabilities include new technologies for advanced studies and machine learning analysis, development of tools and methods on grid stability, load-flow analysis for expansion of power systems, and optimization of existing systems.

With more than 30 years of extensive experience in LNG, Baker Hughes was asked to develop a fully electric solution for Freeport LNG's liquefaction and export project in south Texas. Not only does e-LNG minimize emissions and comply with new regulations, but it's also an efficient choice that's simple to operate, with longer maintenance intervals, and significantly lower total cost of ownership.

### Compression trains

We helped expedite construction of main refrigerant trains 2 and 3, which together have nine centrifugal compression shaft-lines, each driven by a 75-MW electric motor. The compressors are fully integrated with the variable-speed motors, and guarantee approximately 14 MTPA LNG production with a record availability of 99.8%.

Our proven compressor technology can be easily integrated with most electric motors on the market—and our unique testing capabilities can ensure reliable train performance with motors up to 100 MW.



We integrated the electrical system through detailed studies of the interaction between inter-harmonic and sub-synchronous torsional vibration, using real-time simulation to validate variable frequency drive (VFD) control.

To optimize plant availability, we developed and patented a torsional vibration control system, and fully tested it to ensure safe performance at any operating point. This system avoids machine trips and costly downtime related to torsional phenomena, thanks to real-time data acquisition and insight on torsional vibration. This resulted in minimized commissioning and start-up time by preventing unexpected events.

### **Continued operational support**

Since then, the specialists and technologies at our iCenters have provided around-the-clock, real-time monitoring and diagnostics, as well as advisory and troubleshooting to keep plant performance at optimal levels.