Why electric propulsion?
As cargo capacity of modern LNG carriers has dramatically increased, numerous technological improvements have been implemented throughout the vessel - but unlike practically all other ship segments, steam propulsion has remained the propulsion technology of choice. Until now...

In 2003, electric propulsion from ABB was ordered for the first installation in a large size LNG carrier. This decision came following a long period of extensive research by the LNG transportation industry into alternative propulsion technologies. The main advantages of electric propulsion include:

- **Significantly improved fuel economy** - around 48% higher overall propulsion efficiency compared to steam propulsion
- **Reduced installed power** - the electric power plant is utilized both for propulsion and cargo handling
- **Increased cargo capacity** - through efficient modularization and flexible location of machinery components
- **Enhanced maneuverability and crash stop** - the variable speed drives ensure full flexibility in torque, rpm and power output at the propulsion motor
- **Reliability and availability** - through high propulsion redundancy and standardized, well-proven technology

**Extensive experience, proven performance**
Since the delivery of the world’s first AC propulsion system in 1982, ABB has equipped more than 350 vessels with variable speed electric propulsion systems. Our advanced solutions offer a unique level of safety and reliability, thus well suited for the high availability demands of LNG carriers.

ABB also has extensive experience delivering medium voltage power systems to LNG carriers with conventional propulsion, and has in recent years contracted to around 50 new carriers.

**ABB is the world’s leading supplier of electric power and propulsion solutions to the marine industry. We provide power plants and electric propulsion systems offering unmatched operational reliability and economy to meet the high demands of new generation LNG carriers.**

**As shown in this graph, overall propulsion efficiency - from propeller to fuel consumption - for electric propulsion is around 48% higher compared to steam propulsion, generating significant annual cost savings.**

**In 2003, Chantiers de l’Atlantique awarded ABB a contract for supply of electric propulsion system for a new 153,000 m³ LNG carrier owned by Gaz de France. This will be the world’s first large size LNG carrier with electric propulsion.**
LIFE CYCLE SERVICES

ABB has developed a unique service concept designed specifically to address the high, long-term availability requirements for LNG tankers. The 7-step LNG Maintenance Planning program is a comprehensive 30-year agenda covering preventive Maintenance Planning, Spare Parts Management, On-call Services, Commissioning & Installation, Spare Parts Management, Upgrades/Retrofits and Training. Through worldwide Marine Service Centers, ABB system specialists are available 365 days a year for onboard service calls.

ELECTRIC POWER PLANT AND PROPULSION CONCEPTS

Single Screw Electric Propulsion

Twin Screw Electric Propulsion

Azipod® Propulsion

ABB's Azipod® azimuthing podded propulsion system has proven its unique properties for over a decade, and has enabled numerous improvements in ship building and operation. It is today the industry standard in several demanding vessel segments. Safety through full propulsion redundancy and high maneuverability, as well as great design flexibility and all-around economy are features that distinguish Azipod® as the propulsion of choice for an increasing number of vessels types.

Flexible and configurable solutions

ABB provides electric propulsion system arrangements to meet individual customer requirements and redundancy concepts. The figures above (left) show a typical configuration for a 140,000 m³ single screw carrier with a 2-split, 6.6 kV power plant and two medium-speed electric motors connected to a common gearbox. The figures above (right) represent a configuration for a next generation, large-size 200,000 m³ twin screw carrier with an 11 kV power plant and direct-coupled, slow-speed propulsion motors. Both examples feature 50% redundancy from top down to the propulsion motors, providing a speed capacity of around 75% after any single failure in the redundant system.

Unique drive technology

Variable speed drives are critical for optimal performance of an electric propulsion system. Utilizing ABB's award winning DTC - Direct Torque Control - motor control technology, our ACS 6000 Marine Drives offer the most accurate and smooth speed and torque control of any variable speed drive system available. This means minimum torque ripple at the propeller shaft and low vibration and noise levels. Another major benefit of the ABB 24-pulse drive solution is that the harmonic distortion from the propulsion system is kept within classification limits without use of harmonic filters in the main switchboards.

CRP Azipod® Propulsion

Introduced in 2002, CRP Azipod® is an efficient contra-rotating propulsion system for high-power, high-speed vessels. Combining ABB's well proven Azipod® technology with conventional shaftline propulsion, CRP Azipod® delivers increased efficiency compared to other propulsion solutions. For LNG carriers, the CRP Azipod® concept provides redundancy and improved maneuverability in a single skeg design, utilizing the existing electrical power plant.