

A turbo boost for LNG

ABB Turbocharging actively supports the gas and dual-fuel engine development trends through the introduction of high pressure, high efficiency two-stage turbo-charging Power2® and Valve Control Management (VCM®)



Demand for liquefied natural gas (LNG) is on the increase – in the power generation industry as well as, more recently, the marine sector. ABB Turbocharging is strongly committed to continuously developing technologies and maintenance solutions that support this market.

Natural gas, cooled to -162°C and, liquefied, is arguably the most discussed fossil fuel today, and it is likely to remain so in the coming years. Industry in general continues to favor it as an environmentally attractive alternative to other hydrocarbon fuels. In fact, ABB Turbocharging has delivered over 1,700 TPL and TPS turbo-chargers on over 1,100 engines powered with LNG so far.

Natural gas is the preferred choice for electric power generation and industrial sectors because of its low greenhouse emissions – a result of its lower carbon intensity in comparison with coal and oil. And for new power generation plants it is especially attractive because of the relatively low capital investment needed. Also, abundant natural gas resources and stable production contribute to the strong competitive position of natural gas among all the available energy sources.

This trend is clearly visible in the medium and large bore power generation market, where the volume of newly produced diesel fueled engines has dropped significantly since the introduction of the new spark ignited lean burn gas engines and multi-fuel engines.

Another clear trend in the global energy market, and especially in electricity generation, is the need for high flexibility, reliability and fuel efficiency to be available over a wide load range. These requirements can no longer be met by traditional “inflexible” gas turbines, and it is here that the highly efficient gas engines have a key advantage.

A multiple engine setup easily outperforms the traditional gas turbines by enabling an existing power system to operate at maximum efficiency. It does this by effectively absorbing system load variations, allowing a significant saving at the system level, and therefore for consumers. A 2012 study of the California power system by the energy consultancy DNV KEMA showed that adding highly efficient gas engines, instead of traditional, high-start-cost, inflexible gas turbines, enables up to twelve percent of the annual system costs to be saved.

Environmentally relevant

This increasing importance of natural gas is not only evident in the power generation industry; the marine sector, too, has taken note of its environmentally and commercially attractive benefits compared with other fossil fuel solutions. With natural gas as fuel, NO_x emissions are reduced by 85% and SO_x and particulates are practically non-existent compared with traditional diesel engines. The key commercial benefit is that no additional expensive aftertreatment systems are required to meet the new regulations coming into force. Looking at the total cost of ownership, natural gas is potentially a more attractive solution for meeting new emission regulations than any kind of diesel configuration.

While dual-fuel engines are already widely used in the LNG carrier market, pure spark ignited gas engines still tend to be rare in the marine sector. Although operators of ferries, cruise vessels, offshore support vessels and others are showing a growing interest in this technology, the LNG boom in the marine sector for non-LNG carriers is progressing more slowly than was anticipated. This is mainly due to the IMO Marine Environment Protection Committee’s decision to enforce new regulations for ships’ NO_x emissions in 2016 for already designated NO_x Emission Control Areas (NECA) only. Another reason is the lack of a global LNG infrastructure, which is currently limited to specific regions.

Increased engine output

ABB Turbocharging actively supports the gas and dual-fuel engine development trends through the introduction of technologies that include high pressure, high efficiency two-stage turbocharging (Power2) as well as Valve Control Management (VCM). These technologies offer

the possibility of increasing engine output and operational flexibility, enable fixed pitch propeller (FPP) operation and allow an increase in engine efficiency.

ABB turbochargers are used right across the medium-speed gas and dual-fuel engine market, and cover a broad range of marine and power plant applications. ABB Turbocharging also has well-established maintenance management agreement packages, such as the Operation Performance Package (OPAC), that fully support these markets. OPAC enables customers to maintain highest plant efficiency, flexibility and uptime, through monitoring, planning and completion of turbocharger maintenance at a fixed price per running hour – a key factor in today's market environment.

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