

Dragon LNG

CASE STUDY



Photo courtesy of Dragon LNG Limited

BOG reliquefaction for LNG terminals – flexibility at the end of the LNG value chain

Dragon LNG's terminal in Milford Haven, Wales, has been in operation since 2009 and has two 163,000m³ capacity LNG storage tanks. In times of demand, the liquefied gas is pressurized, regasified and delivered to customers via the National Gas Transmission System (NTS). When gas is not required for delivery, the boil-off gas (BOG) from the storage tanks is utilized for on-site power and steam production.

PROJECT INFO

CUSTOMER

Dragon LNG Limited

TYPE

BOG reliquefaction package

LIQUEFACTION CAPACITY

2.6 to 14.2 tons per hour
3.2 to 17.5 MMSCFD

SCOPE

Engineering & Procurement

DELIVERED

2016/17

To serve the versatile British gas market, Dragon LNG required a flexible BOG handling package to be incorporated into the terminal for reliquefying BOG during zero send-out times.

The benefits of the flexible BOG handling system include its rapid liquefaction response time over a variety of BOG compositions and flow rates. Whilst on cold stand-by when gas is being distributed to the NTS, power consumption for the BOG reliquefaction package (RP) is minimized to save electricity.

Wärtsilä's BOG RP enables Dragon to maintain a zero gas flare policy at the terminal during normal operations. This ensures compliance with the region's environmental requirements.

Wärtsilä's BOG RP also replaces the existing on-site power and steam generating plant, which is currently fueled by boil-off gas from the tanks. This will provide higher yield factors in times of gas send-out to the NTS.

The Wärtsilä BOG RP is scheduled to be in full operation by early 2017.

The delivery of this first LNG terminal reliquefaction package supplied by Wärtsilä includes the refrigerant handling system, the coldbox and the LNG pumps. The refrigerant system is based on Wärtsilä's reversed Brayton cycle with nitrogen as the sole refrigerant.

During the past 15 years, Wärtsilä has delivered 40, and 10 under construction, re(liquefaction) packages and complete turn-key plants to the oil & gas industry.

By taking advantage of Wärtsilä's extensive LNG experience, Dragon is able to operate the BOG RP in the most flexible and energy efficient way to keep the LNG cold – at any given time.

The decision by Dragon LNG to install a BOG RP at its Milford Haven terminal represents a significant milestone in enabling fast response to the demands imposed by an exceptionally versatile gas market.

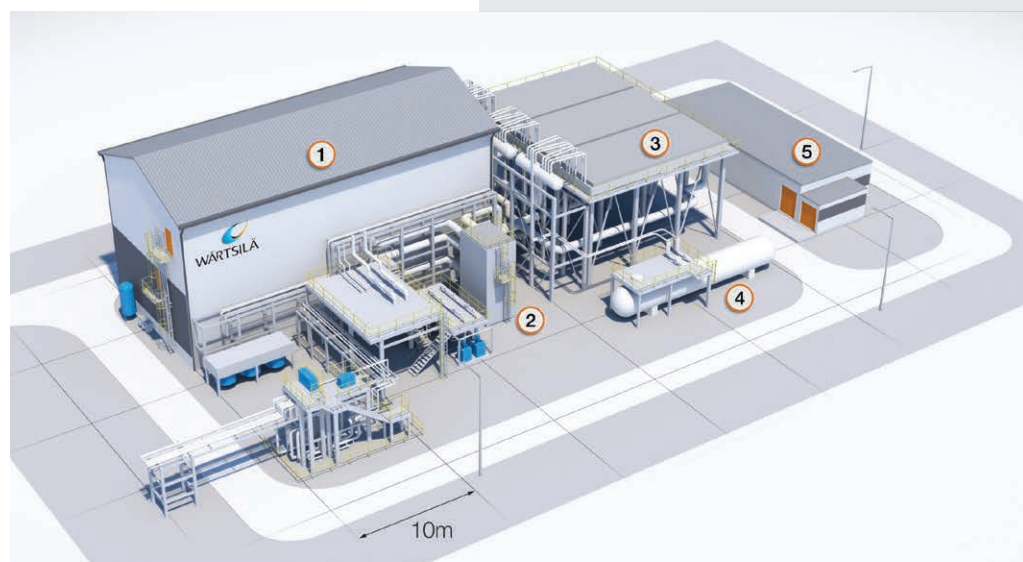
Wärtsilä is renowned for its market-leading gas engine technology and service throughout the entire LNG distribution chain. Wärtsilä's product portfolio includes various gas handling solutions, complete ship designs for LNG carriers, gas-fired marine propulsion systems, land-based gas-fired power plants, liquefaction technologies, LNG loading and unloading facilities and regasification.

In 2015, Wärtsilä was awarded the contract to supply a new LNG terminal in Tornio, Finland, which will be operational in 2019. This installation is indicative of the accelerating LNG demand in Europe's northern regions, which have traditionally been served by pipeline gas.

Future turn-key projects could combine LNG import terminals with BOG reliquefaction packages to maximize flexibility within demanding gas markets in areas covered by strict environmental legislation.

Fig.2 Typical Layout for Wärtsilä BOG Reliquefaction Plant

1. Compressor building
2. Cold box
3. Air coolers
4. Nitrogen tank
5. Electrical and control system



THE CHALLENGE

Brown field site with strict safety regulations

WÄRTSILÄ'S SOLUTION

EP solution

Wärtsilä studies and engineering services

BENEFITS

BOG reliquefaction in the most flexible and energy efficient way

Following strict environmental legislation – zero flare

Replacing onsite co-generation unit to burn BOG, thus allowing higher yield factors in times of gas send-out to the NTS