

## Mid-Scale Floating LNG Storage Systems (FSRU/FPSO)



Natural gas is currently becoming the primary source of energy for various applications because it is highly efficient and environmentally-friendly, making it the fuel of choice not only for domestic and industrial applications but also for power generation.

The development of gas pipeline networks and LNG infrastructures is growing steadily. However, these infrastructures are designed for high-volume consumers and are not practicable for small and isolated energy markets that cannot be linked to a primary network. As a result, until the supply of gas becomes economically viable, islands and isolated communities continue to base their energy needs on more expensive diesel oil or more pollutant heavy fuel oil.

TGE Marine Gas Engineering GmbH has developed small and medium scale LNG import solutions to make the supply of gas attractive to mid-size energy centres with output ranging from 100 MW to 500 MW or even smaller centres or groups of centres. Floating LNG storage systems can be used for monetizing “stranded” gases on production

barges (FPSO) as well as for import barges with regasification equipment (FSRU).

A modular design with IMO type C tanks (i.e. pressure vessels) covers the range from 10,000 m<sup>3</sup> to 100,000 m<sup>3</sup> storage capacity.

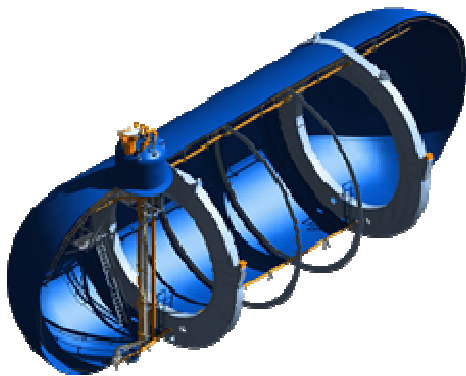


**A 25,000 m<sup>3</sup> FSRU with a 20,000 m<sup>3</sup> shuttle tanker**

Shuttle tankers with up to 40,000 m<sup>3</sup> and IMO type C tanks are an economic shipping solution for the mid-scale LNG market.

State-of-the-art LNG containment systems for large LNG ships such as membrane systems and spherical tank systems, have been developed for very large tank volumes but have an adverse effect on the mid-scale LNG supply chain.

Based on its considerable experience with IMO type C cargo tanks for ethylene carriers, TGE Marine Gas Engineering has upgraded its in-house tank design to cope with the LNG service. This pressure vessel design approach offers significant advantages for

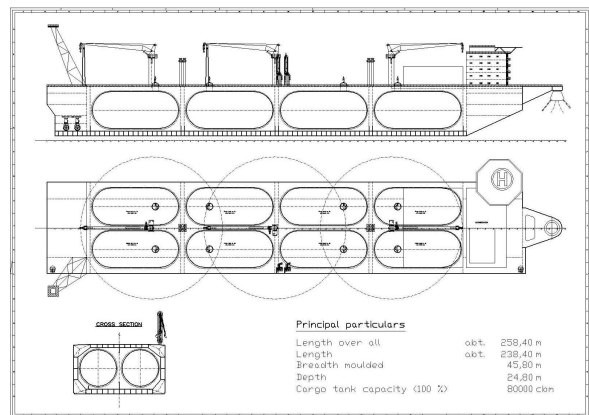


LNG floating applications, both for FSRUs and FPSOs as well as for mid-scale shuttle tankers:



- Design pressure of approx. 4 bar g allows pressure build-up in tanks
- Tanks have no problems with sloshing loads
- Type C cargo tanks do not require a secondary barrier
- Tanks can be fabricated in workshops outside the shipyard, reducing overall barge and vessel construction time

By utilising these modular LNG barge concepts, TGE Marine Gas Engineering has developed topsides for FSRUs (floating storage and regasification units) and FPSOs (floating production [i.e. liquefaction] storage and offloading units) based on references and experience with shore-based projects consisting of a 0.5 mtpa liquefaction plant and receiving terminals on various international locations.



The key specifications of the **FPSO** are (example):

Length o.a.: ..... 172.0 m  
 Breadth moulded:..... 50.4 m  
 Depth:..... 21.5 m  
 Cargo tank capacity (100%):..... 40,000 m<sup>3</sup>  
 Liquefaction capacity: ..... 0.5 mtpa

The key specifications of the **FSRU** are (example):

Length o.a.: ..... 106.4 m  
 Breadth moulded:..... 38.8 m  
 Depth:..... 20.0 m  
 Cargo tank capacity (100%):..... 25,000 m<sup>3</sup>  
 Gas send-out rate: ..... 50 t/h  
 Send-out pressure: ..... 16 bar

For further information, please e-mail to [sales@tge-marine.com](mailto:sales@tge-marine.com)