

Design concept for 60,000 m³ floating LNG storage and regasification unit (LNG-FSRU) for Mediterranean Islands



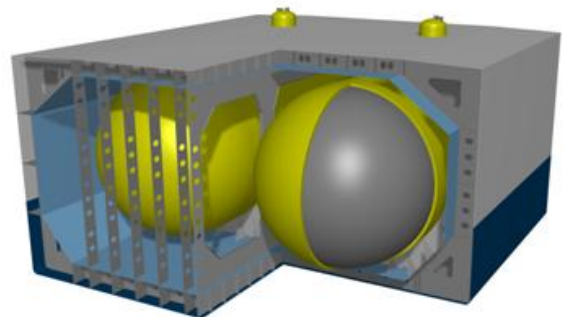
Due to the enormous demand for clean energy in the world and strong price increase for natural gas, LNG has become a strong competitor for pipeline gas. Administrative constraints and safety concerns against shore-based installations may call for an offshore storage and regasification unit as a suitable alternative.

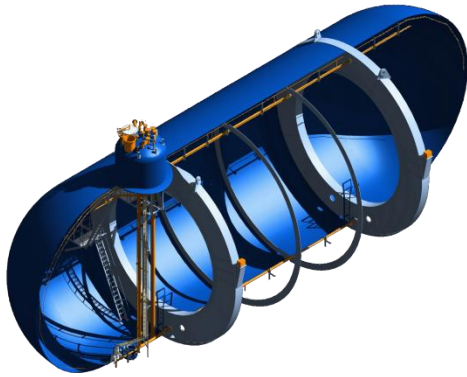
This alternative future business application would request a technically sound, economical and fast to implement technology for storage, processing and offloading.

State-of-the-art tank containment systems for large LNG ships, namely membrane systems and spherical tank systems are called into question by the industry as they may have disadvantages for offshore floating storage. Membrane systems are questioned to be vulnerable to sloshing loads and the spherical

tank design leaves very limited space for any process plant on the main deck.

Based on its vast experience with IMO type C cargo tanks (i. e. pressure vessels) for ethylene carriers, TGE has upgraded its in-house design for LNG service. This pressure vessel design





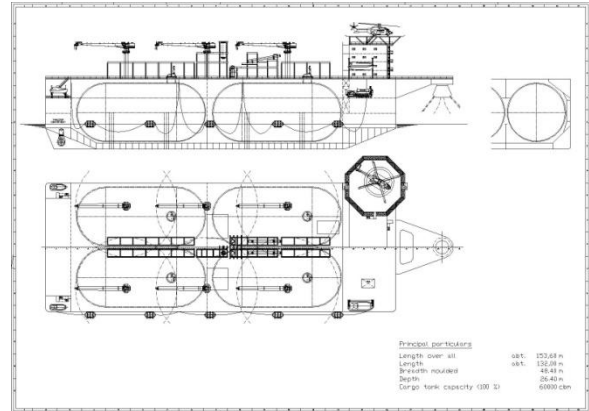
approach has significant advantages for LNG floating offshore applications, both FSRUs and FPSOs:



- Design pressure of approx. 4 bar g allows a pressure build up in the 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, which reduces the total LNG-FSRU/FPSO construction time

TGE has developed modular LNG-barge concepts for up to 100,000 m³ capacity with cylindrical LNG tanks up to 15,000 m³ capacity each, which may serve either as FSRU ("Floating storage and regasification unit") or FPSO ("Floating production [i. e. liquefaction] storage and offloading unit"). Specific tank

weights are comparable to prismatic IMO type B tanks, making the design cost efficient.



The main characteristics of the TGE LNG-barge are (example):

- Length over all: 153,60 m
- Breadth moulded: 48,40 m
- Depth: 26,40 m
- Cargo tank capacity (100%) 60,000 m³
- Barge net steel weight: 15,500 tons

Topside designs have been developed for different capacities and projects:

Example for FSRU application:

- Gas send-out rate: 50 - 200 mmscfd
- Send-out pressure: 60 to 80 bar
- LNG vaporizers: vertical shell & tube water-glycol heated



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