TORGY

Challenges in Developing Prismatic Tanks for LNG

Stavanger 03/14

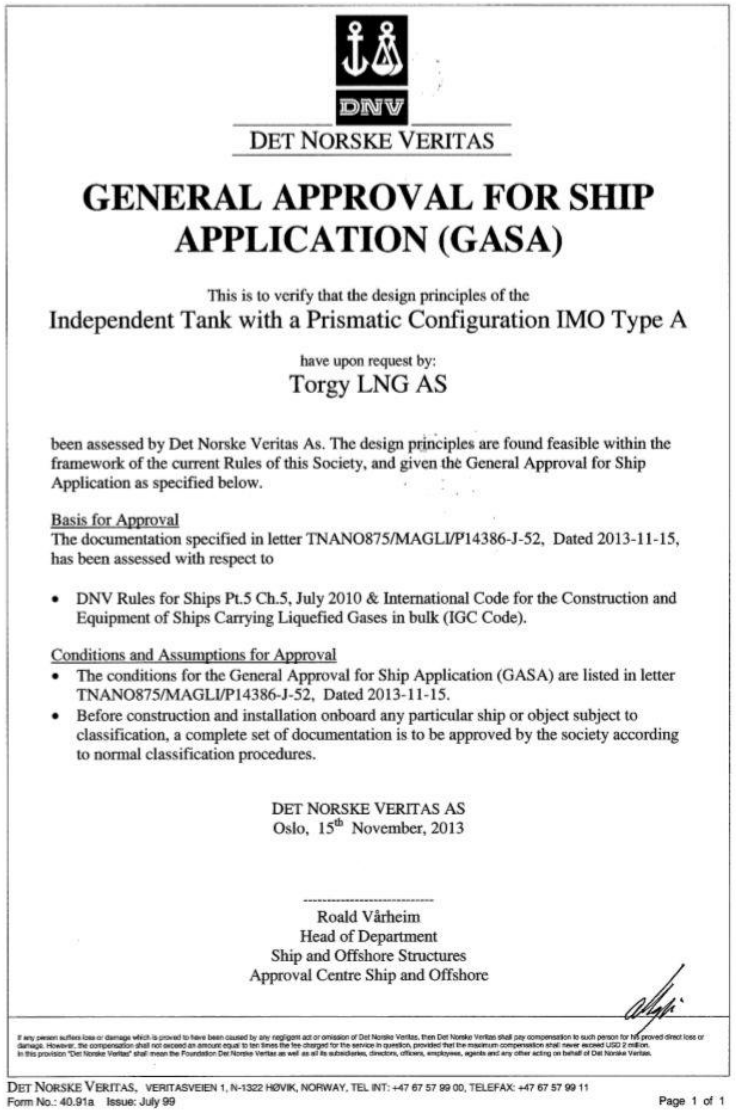
Torgy delivers turnkey solutions including engineering, planning, purchasing, project management and installation of LNG fuel systems for shipping and land based industry.

The IMO A LNG Tank

Fairly new technology

Only one company with General Approval for Ship Applications

(*and that's only just happened!)*



DET NORSKE VERITAS

GENERAL APPROVAL FOR SHIP APPLICATION (GASA)

This is to verify that the design principles of the
Independent Tank with a Prismatic Configuration IMO Type A

have upon request by:
Torgy LNG AS

been assessed by Det Norske Veritas As. The design principles are found feasible within the framework of the current Rules of this Society, and given the General Approval for Ship Application as specified below.

Basis for Approval
The documentation specified in letter TNANO875/MAGLI/P14386-J-52, Dated 2013-11-15, has been assessed with respect to

- DNV Rules for Ships Pt.5 Ch.5, July 2010 & International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in bulk (IGC Code).

Conditions and Assumptions for Approval

- The conditions for the General Approval for Ship Application (GASA) are listed in letter TNANO875/MAGLI/P14386-J-52, Dated 2013-11-15.
- Before construction and installation onboard any particular ship or object subject to classification, a complete set of documentation is to be approved by the society according to normal classification procedures.

DET NORSKE VERITAS AS
Oslo, 15th November, 2013

Roald Vårheim
Head of Department
Ship and Offshore Structures
Approval Centre Ship and Offshore

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

DET NORSKE VERITAS, VERITASVEIEN 1, N-1322 HØVIK, NORWAY, TEL INT: +47 67 57 99 00, TELEFAX: +47 67 57 99 11
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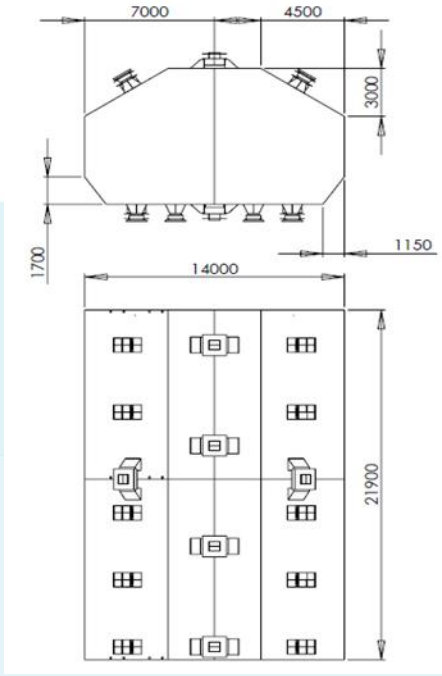
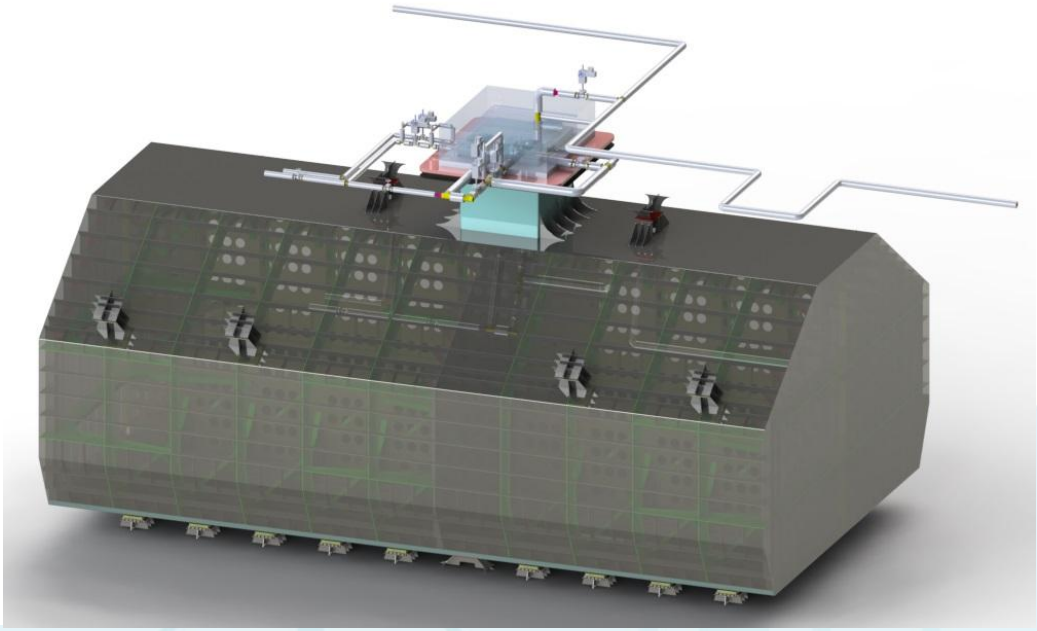
What are the challenges?

- Technical
  - Tank Supports (providing stability whilst allowing for movement and preventing Thermal Bridge)
  - Secondary Barrier (ensuring gas tightness)
  - Sloshing (internal baffles)
- Commercial

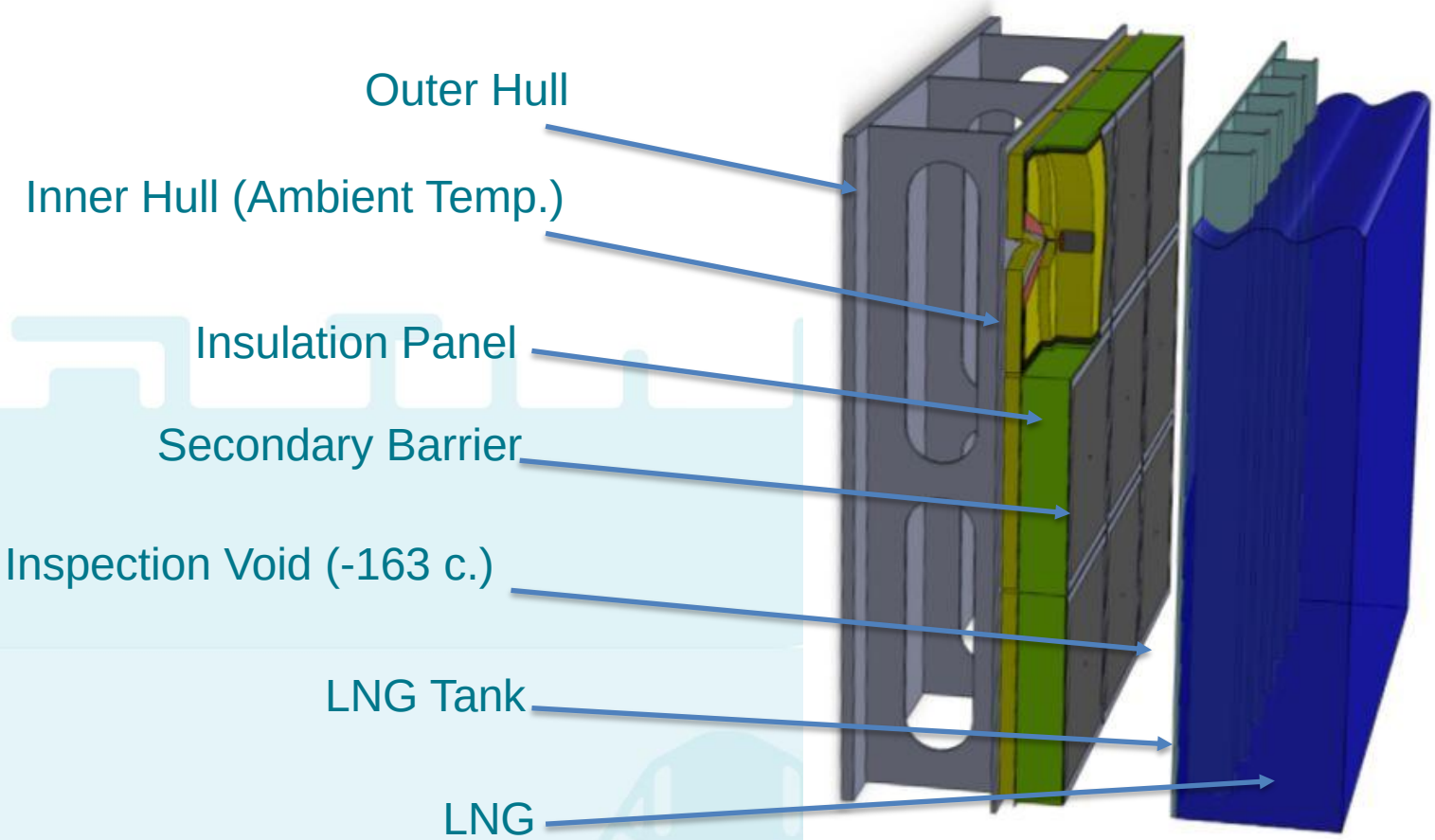
Torgy Tank Support System

- Torgy’s Patented support system ensures a stable and cost effective installation.



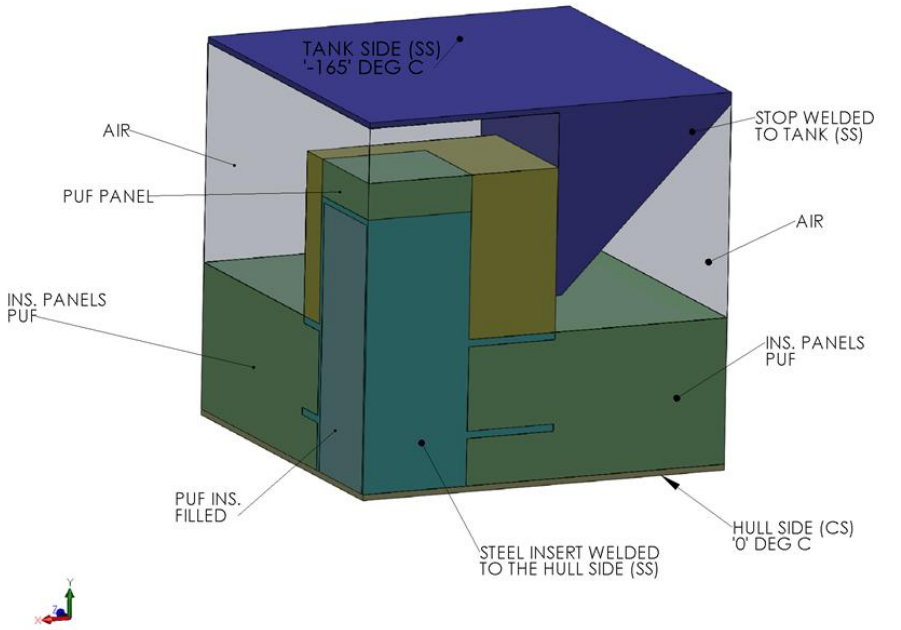


Torgy's Secondary Barrier Solution



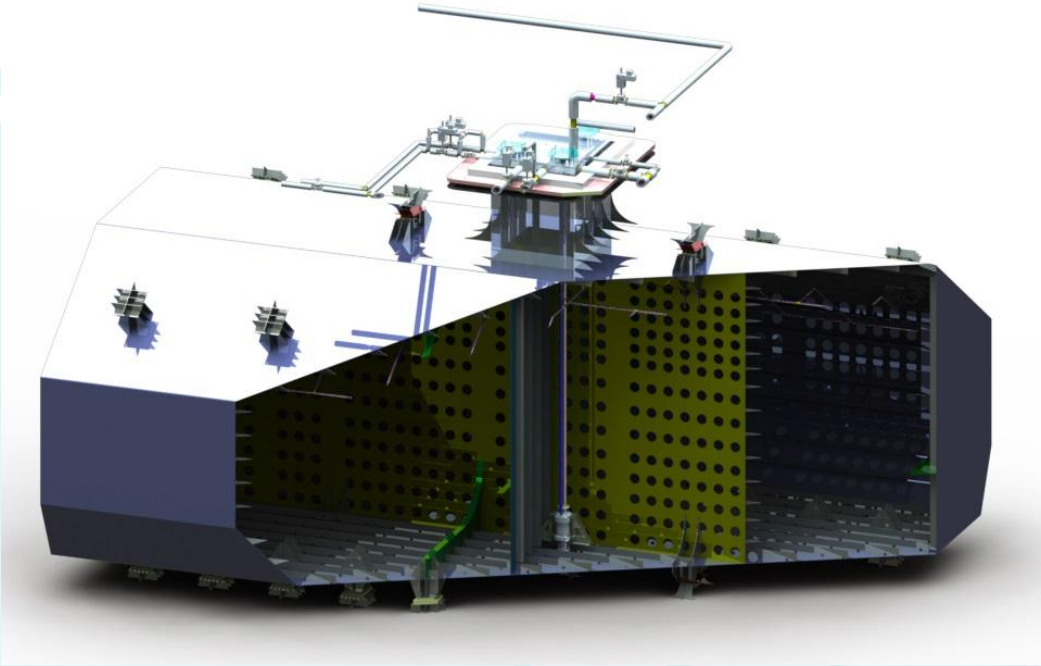
Torgy Insulation and Tank Support Solution

- Torgy's tank support system is unique and based upon decades of experience in cryogenic insulation and support systems for the oil and gas sectors.



Torgy IMO A Tank is ideal for Bunkering

- Torgy tank baffles are effective at all levels of filling



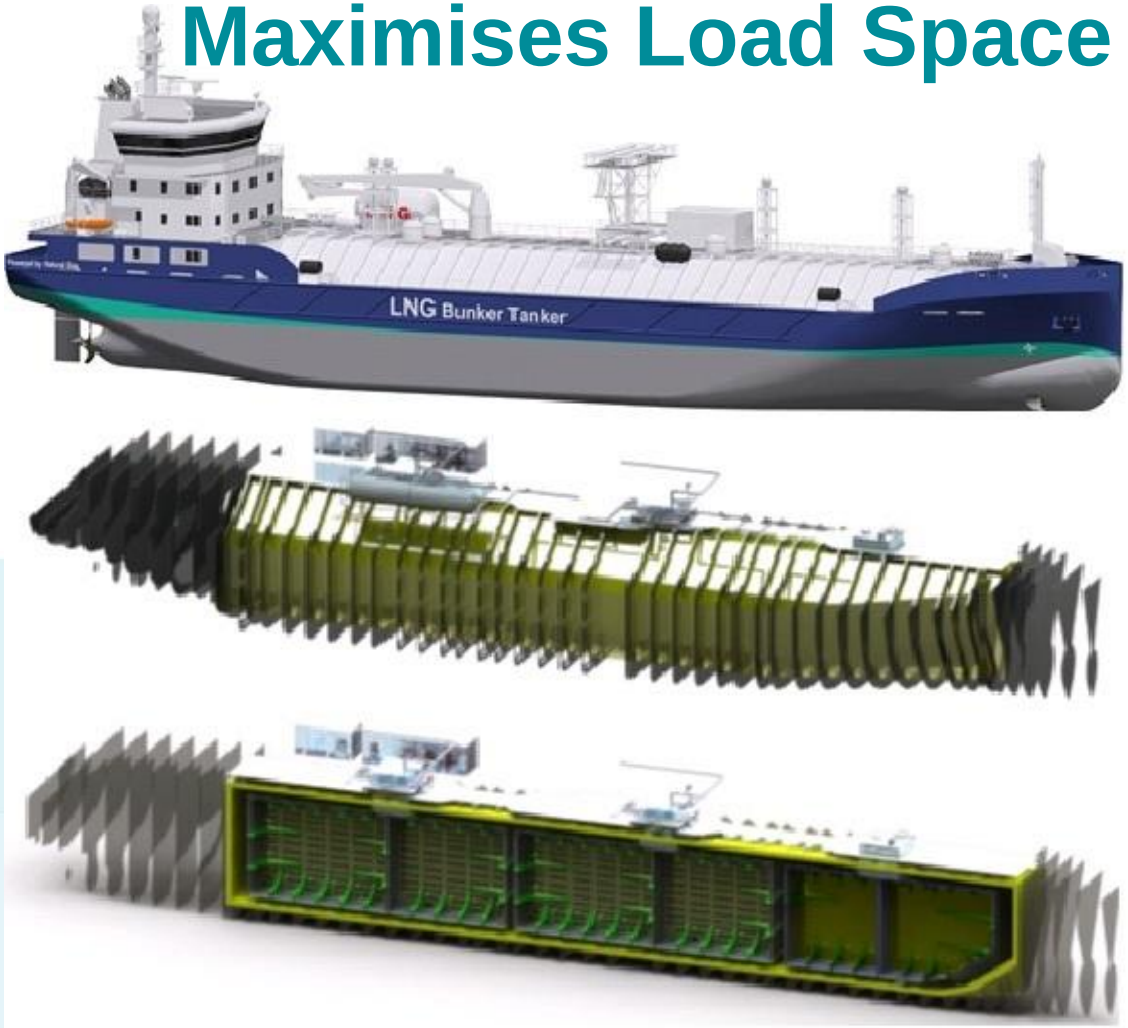
Commercialising

Rolls Royce Marine have offered huge amounts of support and added credibility

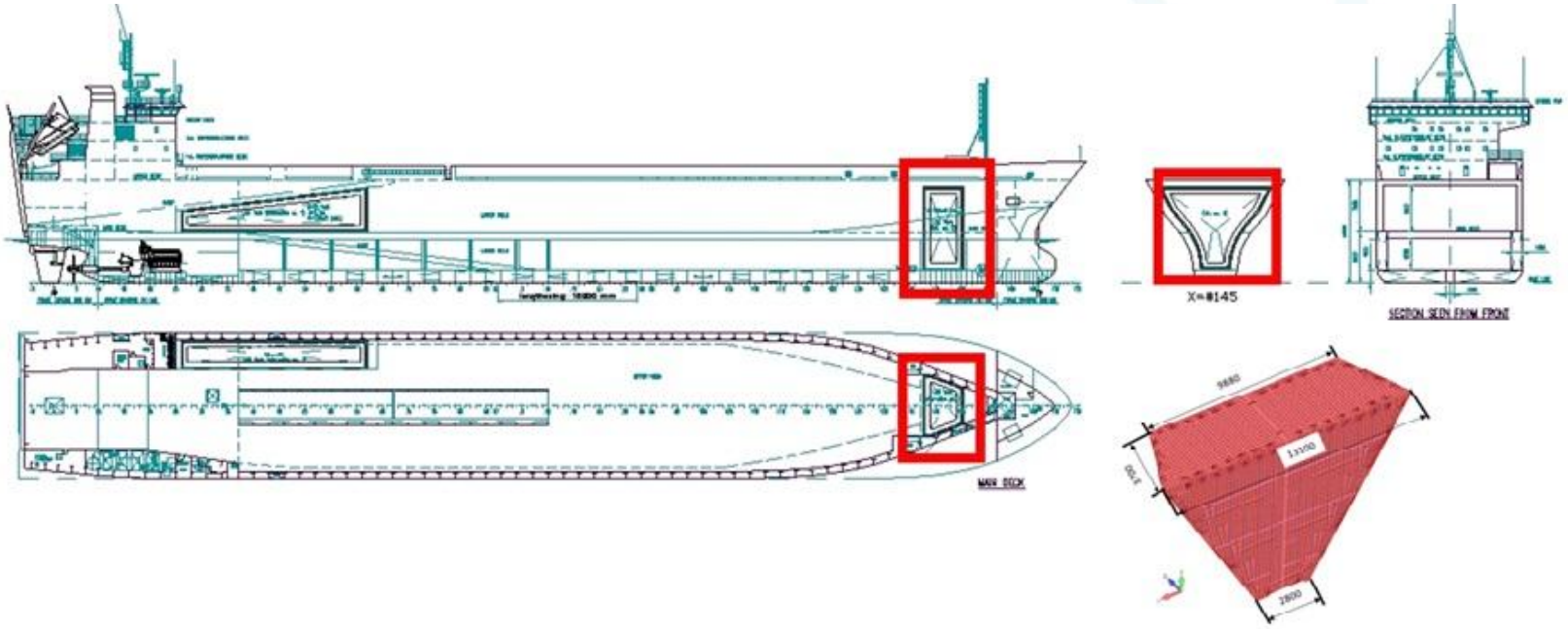
6,200m3 Shuttle Tanker

- Vessel to be delivered Q3 2015 from AVIC Ding Heng Shipyard, China

Torgy LNG Containment System Maximises Load Space

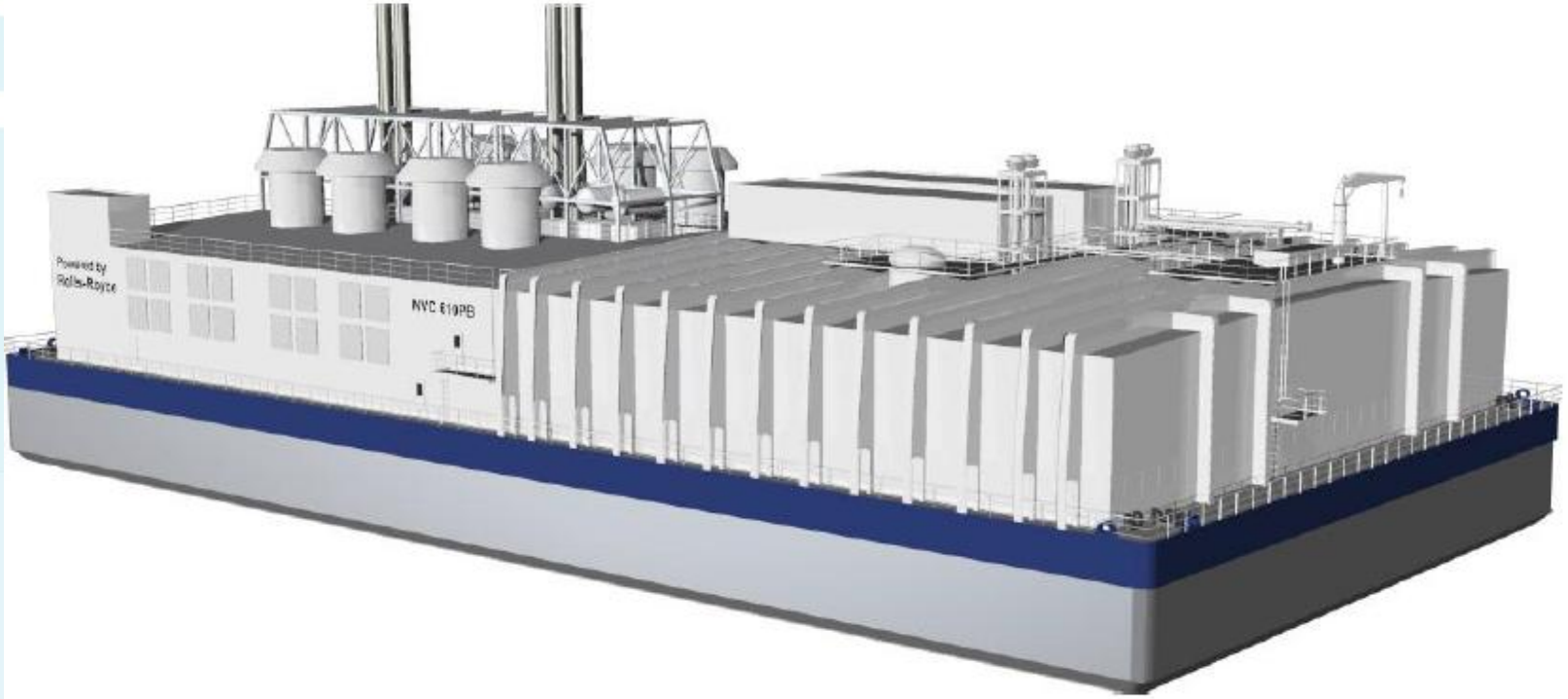


Fuel Tanks for Shipping



Creating New Markets

- Power Barge designed by Rolls Royce



KEEPING IT ALL TOGETHER