

# Membership case study: Lloyd's Register



## Lloyd's Register Gas Technology

One of our roles is to qualify technology and provide analysis that helps the industry make, what are often difficult, investment decisions about novel concepts and approaches.

### CONTEXT & OBJECTIVES

Gas Technology is needed more than ever as gas exploration, production and consumption all continue to grow. This activity is creating growing demand for gas infrastructure and expertise to design, build and operate new assets in safety. Gas as a fuel of the future is creating interest as it meets the requirements for stricter environmental and emissions regulations. This is not just an issue for on-board ships as Ports and Terminals must be able to handle gas bunkering in safety.

### SOLUTION

**Our gas technology expertise has emerged out of over 40 years of marine leadership in LNG carrier classification and our offshore energy activities around the world.**

### New Rules and Guidance for natural gas as a marine fuel

Gas as a fuel presents certain risks and hazards which need to be addressed, but operational reality requires that flexibility also needs to be accommodated in the new rules that interface effectively with risk-based approaches to dealing with novel concepts. Lloyd's Register has been working to ensure that shipowners, ship designers, shipbuilders, equipment manufacturers and technology developers can meet safety and performance goals by developing an approach that involves prescriptive and risk-based approaches for when there are no rules. We looked at what's novel in designing gas-fuelled ships and we developed rules that will now evolve as solutions based on a thorough evaluation of risk which eventually can support rule-based solutions. This is an ongoing process of constant improvement following proven performance. The new rules draw on Lloyd's Register industry experience as the market leader in classification of LNG carriers. At any time Lloyd's Register is running dozens of

projects looking at and evaluating new technology, working with yards, owners, containment systems developers, equipment manufacturers and engine makers. The main hazards to be addressed are related to: gas in non gas carrier type ships, gas fuel tank location, vapour management and bunkering.

### Safe, practical location of LNG-as-fuel tanks

LNG tanks need to be located to provide safe operations and also minimise loss of cargo space as well as reducing the impact on cargo operations. The challenge is particularly significant in containerhip designs where operators are looking for designs that minimise cargo space while ensuring safe location and convenience for bunkering operations. In bulk carriers, there is still a challenge to find freedom to accommodate the additional volume required by gas tanks – although ensuring that cargo operation are not compromised.

### LNG Bunkering guidance – for ships, terminals and ports

Lloyd's Register has developed the capability to assist and port operators to help them develop a solid understanding of the steps involved in addressing LNG bunkering risks.



## Fuels of the future – methanol from natural gas and other alternatives

Lloyd's Register is working with Stena, looking at methanol as a fuel for its ferries. Methanol is sulphur-free and is currently 3-4 times cheaper than marine distillate fuel. It can be produced from a variety of sources including biomass/waste, captured CO2 and renewables, if natural gas does increase in abundance and remains competitively priced we have been working to see if this is a practical approach. 'Methanol ticks all the boxes' Dan Sten Ollsen of Stena when talking about its potential at a meeting with the European Commission in late 2012.

## OUTCOMES

- 1) Approval of the first deep sea dry bulk carrier design powered by LNG in a JIP with COSCO and Golden Union. This JIP has moved bulk carrier design far beyond the concept stage for gas-powered ships.
- 2) Worked with the shipyard, shipowner and port and terminal authorities to support the Viking Grace passenger ship, the largest (by far) LNG fuelled project to date. The Viking Grace entered service in January.
- 3) World's first gas-fuelled newbuilding tanker, Argonon.

"We have moved the industry far beyond the concept stage," says Nick Brown, Lloyd's Register's Area General Manager and Marine Manager, Greater China.

"We have addressed the technology issues; at the end of 2012 we issued an approval in principle (AIP) for the product of the project – a new gas-fuelled bulk carrier design christened 'Clean Sky'.

"The best JIPs are ones in which shipyard, designer, owner and class all work together to achieve a mutual goal of developing a "market driven" design, that is future proofed as far as possible, and attractive to owners due to its operational efficiency and flexibility. When new technology is involved as in this case it is also very important that the technology providers, such as engine makers, are involved at the earliest stage," says Nick Brown.

"If all parties work together the owners gain access to a design that meets their expectations and the yard are able to offer a design that suits the market. The technology provider gains early entry into the market and class is able to ensure all parties are aware of rules, regulations and codes that need to be applied to the design at the earliest stage."

## What are the first steps people can take to replicate this idea/initiative?

1. **Understand the risks and benefits**
2. **Engage the right stakeholders and area of expertise**
3. **Take a risk based approach to overcome the challenges**

### More information:

[www.lr.org/sectors/marine](http://www.lr.org/sectors/marine)

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