Design and building of LNG vessels

LNG Bunkering Seminar
Klaipeda, October 17th. 2014

CEO Rolf Fiskerstrand
Fiskerstrand Verft AS
Fiskerstrandens Slip & Motorverksted
Indehaver Peder Fiskerstrand pr Aalesund.

Fiskerstrand Verft AS - rich on traditions
PART OF THE MØRE MARITIME CLUSTER

18 SHIP OWNERS
14 SHIP DESIGN COMPANIES
14 SHIP YARDS
172 EQUIPMENT SUPPLIERS

22 500 SKILLFUL EMPLOYEES
55 000 000 000 NOK TURNOVER IN 2013
(6.800 000 000 EURO)

A world class maritime cluster-advanced marine operations
**Main Dimensions:**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length, over all</td>
<td>129.90 m</td>
</tr>
<tr>
<td>Breadth, moulded</td>
<td>18.80 m</td>
</tr>
<tr>
<td>Depth, moulded main deck</td>
<td>6.45 m</td>
</tr>
<tr>
<td>Depth, moulded shelter deck</td>
<td>9.50 m</td>
</tr>
<tr>
<td>Car Units (PCU)</td>
<td>242</td>
</tr>
<tr>
<td>Passengers</td>
<td>600 Persons</td>
</tr>
<tr>
<td>Gross Tonnage</td>
<td>7538 GRT</td>
</tr>
<tr>
<td>Service speed</td>
<td>20.5 knots</td>
</tr>
<tr>
<td>Max speed</td>
<td>23.0 knots</td>
</tr>
<tr>
<td>LNG tank cap.</td>
<td>2 x 125 m³</td>
</tr>
</tbody>
</table>

**Class:** DnV 1A1, CAR FERRY A, GAS FUELLED, CLEAN, RP, E0, R3 (NOR)

- Gas Electric Propulsion Systems
- Diesel Electric back-up system
- Fuel efficient and environmental friendly
- High redundancy; 2 x LNG tanks, 3 separate LNG engine rooms.
“Selbjørnsfjord” - Delivered 2010

Design – MM 105 FE LNG

Main Dimensions:

- Length, over all: 109.00 m
- Breadth, moulded: 16.80 m
- Depth, moulded: 5.50 m
- Car Units (PCU): 120
- Passengers: 249 Persons
- Gross Tonnage: 2990 GRT
- Service speed: 12 knots
- LNG tank cap.: 125 m³

Class: DnV 1A1, R4, Gas Fuelled, Car Ferry B, E0

- Gas Electric Propulsion Systems
- Diesel Electric back-up system
- Fuel efficient and environmental friendly
- Low turn-around time
“Two ferries delivery to Boreal Transport Nord AS” - Delivery 2015

Design – MM 55 FC LNG

Main Dimensions:

- Length, over all: 62.50 m
- Breadth, moulded: 13.20 m
- Depth, moulded main deck: 5.50 m
- Car Units (PCU): 40
- Passengers: 100 Persons

Class: DnV 1A1, CAR FERRY A, GAS FUELLED, CLEAN, RP, E0, R3 (NOR)

Name: TBN

Owner: Boreal Transport Nord AS

Yard: Fiskerstrand Verft AS

Current status: Production has started.

- Gas Electric Main Propulsion
- Diesel back-up Propulsion
- Highly efficient hull shapes, low drag, low power consumption
“With Harvest” and “With Marine” - Delivered 2014

Design – MM 70 CC LNG

Main Dimensions:

- Length, over all: 69.90 m
- Breadth, moulded: 17.20 m
- Depth, moulded: 8.60 m
- Gross Tonnage: 3,250 GRT
- Cargo hold capacity: 5,000 m³

**Class:** DnV +1A1 General Cargo Carrier, Gas fuelled, Clean, TMON, E0

- LNG Powered Main Propulsion
- St.by Diesel Electric Propulsion
Design – MM 66 TP LNG

Main Dimensions:
- Length Over All: 60.60 m
- Breadth Moulded: 12.00 m
- Draught: 5.00 m
- Tank capacities:
  - LNG (90%): 880 m³
  - Oil products: 500 m³

CLASS: DnV (or similar) + 1A1, “Tanker for Liquefied Gas”, “Tanker for Oil products”, ICE 1B, E0, R3

IGC code: IMO type 2G (-165°C/ 6 bar) for carrying Liquifies Natural Gas

IBC code: IMO type II and III for carrying light petroleum products.

Medium: LNG (CH4)
Temperature: -196 / +50°C
Design pressure: 9 bar
Max. cargo density: 500 kg/m³
Net volume –cold: 800 m³
Volumetric filling: 0.95
Cargo pumps: 2 x 400 m³/h (5 bar)
Design – MM 66 TP LNG

Main dimensions and capacities:
- Length Over All: ~69.90 m
- Breadth Moulded: ~13.40 m
- Draught scantling: 4.00 m
- Medium: LNG (CH4)
- Temperature: -196 / +50°C
- Design pressure: 5 bar
- Max. cargo density: 500 kg/m³
- Net volume –cold: 2 x 1000 m³
- Volumetric filling: 0.95
- Cargo pumps: 1 x 200 m³/h (5 bar)

CLASS: DnV +1A1 Barge for Liquified Gas
M/F FJALIR-1974 → SEAGAS-2013

- from ferry to a LNG bunker vessel

- Pilot project / prototype
- Conversion to the world’s first dedicated LNG bunker vessel
- Hull and engine/propulsion system kept
- Not need shore gas terminal for the operating vessel
- Short turnaround in terminal

L = 49m
Speed 12 knots
Gas tank 170m³
THANK YOU FOR YOUR ATTENTION!