LNG BUNKERING - KLAIPEDA CASE

Habil. Dr., Captain, Prof. Vytautas Paulauskas
Klaipeda Shipping Research Centre
OIL TERMINALS ON EAST COAST OF THE BALTIC SEA
PLANNING AND FUNCTIONING GAS TERMINALS IN EAST BALTIC SEA PORTS
LNG INFRASTRUCTURE FOR SHIP FUELLING IS BEING DEVELOPED (DNV)
REGULAR FERRY ROUTES IN THE SOUTH BALTIC SEA AREA
SHIPS IN SOUTH-WEST BALTIC
PRE-CONDITIONS USE LNG FUEL

- New SOx regulations for the Baltic Sea
- Ships fuel prices
- Environmental impact by the traditional ships fuel
- Limit of the traditional fuel
REGION SITUATION

• LNG import terminals in Baltic Sea
  – Swininoustje
  – Klaipeda

• Possible spread LNG supply chains
  – East part of the Baltic Sea
  – West part of the Baltic Sea
KLAIPEDA PORT
KLAIPEDA PÖRT NAVIGATION MAP
LNG TERMINAL LOCATION
PLANNING KLAIPĖDA LNG TERMINAL
LNG TERMINAL LOCATION
PLANNING LNG FUEL FOR THE RO-RO SHIPS QUANTITIES IN KLAIPEDA PORT

- 8 – 10 Ro-Ro ships constantly work on Ro-Ro lines link Klaipeda port with other ports
- Ro-Ro ship in average should use per day up to 40 – 60 m³ LNG
- Planning LNG fuel per week for the Ro-Ro ships (weekly bunkering) 3000 – 4000 m³ LNG
PLANNING LNG FUEL FOR THE RO-RO SHIPS QUANTITIES IN EAST BALTIC

- Number of the ships in Baltic Sea (every day) – 2200 – 2600
- Ships, which has length up to 100 m – about 35 %, that means about 770 – 910 (did not oriented to LNG)
- Number of the Ro-Ro vessels visit East Baltic ports – about 30 – 40 (from Kaliningrad up to Tallinn) (object to LNG fuel)
- Weekly request of the LNG fuel for the Ro-Ro vessels – 10000 – 15000 m²
COMBI VESSEL WITH LNG ENGINE (Example) (DNV)
LNG FUEL POTENTIAL

USERS

• Ships (mainly Ro-Ro vessels on first stage)
• Cities small boiler stations
• Cities public transport
REQUEST FACILITIES

• LNG supply ships (delivery LNG from LNG terminals to LNG supply stations and directly to the ships)
• LNG supply stations (could be in many ports)
• Road transport units delivery LNG from LNG supply stations to users
• Inland waterways LNG supply barges
RO-RO SHIP BUNKERING BY LNG SUPPLY VESSEL
(SWEDISH MARINE TECHNOLOGY FORUM)
LNG FUEL SUPPLY RÖ-RO SHIP BY ROAD TRANSPORT (DNV)
POSSIBLE LNG SUPPLY STATION LOCATION IN KLAIPEDA PORT
POSSIBLE SUPPLY STATION LOCATION (Quay wall “0”)
PLANNING LOCATION LNG SUPPLY STATION
PLANNING LOCATION LNG SUPPLY STATION AND TERRITORY
LNG FUEL SUPPLY IN KLAIPEDA PORT MAIN CONDITIONS

• LNG fuel quantity on LNG supply vessel should be at least for the 2 Ro-Ro vessels
• LNG supply vessel must have possibility fulfill at least 2 times per week on LNG terminal
• LNG supply vessel could provide LNG supply operations near Ro-Ro quay walls or in port waters
• LNG supply vessel should be able supply LNG shore facilities
PORT LNG SUPPLY SHIPS MAIN PARAMETERS

- Length up to 40 – 50 m
- Width up to 10 – 12 m
- Draft up to 3,5 – 5,0 m
- Capacity (LNG) not less as 800 – 1200 m³
- Speed up to 10 kn
LNG FUEL SUPPLY IN EAST BALTIC PORTS MAIN CONDITIONS

• LNG fuel quantity on LNG supply vessel should be at least for the 1 – 2 ports (at least for 4 - 6 Ro-Ro vessels in one port)
• LNG supply vessel must have possibility fulfill at least 1 time per week on LNG terminal
• LNG supply vessel could provide LNG supply operations near quay walls or in port waters
• LNG supply vessel should be able supply LNG shore facilities
DISTANCES BETWEEN KLAIPEDA AND OTHER PORTS

• Klaipeda – Baltjsk – 110 n.m. – 8 h
• Klaipeda - Liepaja – 55 n.m. – 5 h
• Klaipeda – Ventspils – 120 n.m. – 12 h
• Klaipeda – Riga – 236 n.m. – 18 h
• Klaipeda – Paldisky – 285 n.m. – 22 h
• Klaipeda – Tallinn – 320 n.m. – 24 h
LNG SUPPLY VESSEL
ROUND TRIP

- To Liepaja – 1,5 days
- To Baltjisk - 1,8 days
- To Ventspils – 2 days
- To Riga – 2,5 days
- To Paldisky – 2,8 days
- To Tallinn – 3 days
LNG SUPPLY SHIPS FOR THE EAST BALTIC SEA MAIN PARAMETERS

• Length up to 100 - 115 m
• Width up to 12 – 16 m
• Draft up to 5.5 – 6.5 m
• Capacity (LNG) up to 5000 – 7000 m³
• Speed up to 14 – 16 kn
POSSIBLE LNG SUPPLY SHIP, \( L = 97 \) m, \( B = 14.4 \) m, \( T = 5.3 \) m, \( \text{DWT} = 2800 \) m\(^3\)
POSSIBLE LNG SUPPLY SHIP, $L = 111$ m, $B = 15.5$ m, $T = 6.3$ m, $DWT = 4300$ m$^3$
POSSIBLE LNG SUPPLY SHIP,
L = 120 m, B = 18.6 m, T = 6.8 m,
DWT = 7550 m³
• Ro-Ro vessels are main LNG fuel object in East Baltic ports (on first stage)
• For the LNG supply in port should be facilities for the LNG operations
• In general should be in port small (600 - 1000 m³) supply vessel
• At least 1 LNG supply vessel (4000 – 7000 m³) should be in East Baltic (in case port LNG supply vessels will be able in main Ro-Ro ports)
THANK YOU FOR YOUR ATTENTION: QUESTIONS?