LNG Development in Świnoujście

Marcin Przywarty
Maritime University of Szczecin, Poland
Institute of Marine Traffic Engineering
Introduction Szczecin – Świnoujście

The port of Świnoujście is situated on the western part of Polish coast. It has capacity to receive vessels of up to 13,2m in draught and 270m in length. Largest Polish bulk terminal, largest ferry terminal.

The port of Szczecin is situated 68km inland from the open sea - about 4 hours sailing. It can accept vessels of up to 9,15m in draught and 215m in length.
Project

1. Development of the assumptions of the LNG terminal construction
2. Determination of the alternative LNG terminal locations and the estimation of cost of their construction
3. Selection of the optimal variant of the LNG terminal using the criterion of minimizing of the navigational risk
4. Selection of the optimal variant of the LNG terminal using the criterion of minimizing of the economical risk
5. Determination of the optimal parameters of the LNG terminal
Assumptions of the LNG terminal construction

The basic parameters of the planned LNG terminal include:
• size of the planned LNG terminal handling
• size of the supported LNG carriers

It was assumed that in the first stage of operation, the LNG terminal should enable the re-gasification of 2.5 bn m$^3$ of natural gas annually. In the next stages, depending on the increase of demand for gas, it will be possible to increase the dispatch capacity up to 5, and even up to 7.5 bn m$^3$ of gas.

LNG unloading installation adjusted for LNG carriers assumed to be from 75.000 m$^3$ to 216.000 m$^3$ (Q-flex)
Q-Flex LNG carrier
Alternative LNG terminal locations

Gdańsk – Northern Port
Świnoujście – External Port
Alternative LNG terminal locations

Pursuant to conducted analyses, it was decided to locate the LNG terminal in Świnoujście.

The following factors influenced the decision:
- regulated legal situation of the land designated for construction of the terminal (the land is owned by the port, communes and the Forest Divisions and is free from any third party rights)
- lower costs
- shorter LNG transport route (navigational safety)
- greater demand for gas in the north-western region of Poland.
Navigational safety analysis
Stochastic simulation model

**Probability of accident on given ships routes with consideration for grounding, fire and collision**

<table>
<thead>
<tr>
<th>LNG route</th>
<th>No. of groundings</th>
<th>P_g/year</th>
<th>No. of fires</th>
<th>P_f/year</th>
<th>No. of collision s</th>
<th>P_c/year</th>
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</tbody>
</table>
Optimal parameters of the LNG terminal

Research stages:
1. Initial definitions of port layout
2. Simulation research
3. Wave analyses (CFD models)
4. Research verification (new layout)
5. Simulations with wave estimation
6. Corrects and changes
7. Iterations 2-6

Final
Optimal parameters of the LNG terminal
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- **one full mission navigation bridge simulator** with 270° visual projection, equipped with live and screen-simulated marine ship equipment including ARPA, ECDIS and DP class 2 consoles (**accredited for DP training**),
- **two multi task navigation bridges** with 120° visual projection, equipped with mix of real and screen-simulated ship-like equipment including Voith-Schneider tug console,
- **two desktop PC simulators** with one monitor visual projection and one monitor screen simulated ship-like equipment,
- and a dedicated staff of more than 20 teachers and scientists
Marine Traffic Engineering Centre
Optimal parameters of the LNG terminal
Optimal parameters of the LNG terminal

- Planned outer port
- Land part of development areas – about 60 ha
Technical parameters of terminal

Send-Out Characteristics:

- Nominal Capacity: 570,000 m³/h
- Maximum Capacity (115%): 656,000 m³/h
- Expansion Nom. Capacity: 856,000 m³/h
- Expansion Max. Capacity: 984,000 m³/h
- Minimum Capacity: 75,000 m³/h holding mode, 150,000 m³/h unloading mode

Gas pressure: 6.3 – 8.4 MPa
Minimum temperature: 1°C

Storage: 2 x 160,000 m³ (gross capacity) ‘full-containment’ tanks, LNG re-gasification installation, including 2 systems providing heat to the process:
- SCV – submerged combustion vaporizer (base heating source)
- ORV – open-rack vaporizer (additional heating source, under environmental permission procedure now)
LNG Terminal in Świnoujście responsibilities

• Polish LNG (PLNG) overall project, terminal operator, shore regasification terminal, LNG tanks construction
• Szczecin-Świnoujście Seaport Authority (quay owner, mooring infrastructure, LNG tech. platform, trestle bridge, water intake)
• Maritime Office in Szczecin (Polish Maritime Authority) outside breakwater, fairway, navigational rules, VTS assist, nav. marking, traffic navigational safety.
• Gaz System SA – gas pipeline construction, coordination of the project
• Maritime University of Szczecin (MUS) – knowledge provider in navigational and safety aspects, training of ship, and shore personnel.
Realization of plans

- On 23 March 2011 a ceremony of laying the cornerstone of the LNG Terminal was held in Świnoujście.
- On 30 November 2011 construction of concrete walls of the second LNG tank in Świnoujście Terminal was completed.
- On 10 August 2012 the roof on the second liquefied natural gas storage tank was erected.
- According to plans LNG Terminal in Świnoujście will be handed over to operation on 30 June 2014.
Realization of plans
Realization of plans

The LNG terminal in Świnoujście building online view:

Roof raising operation
The LNG terminal in Świnoujście - a view to the future
THANK YOU FOR YOUR ATTENTION
19 August 2008 - the Council of Ministers adopted a resolution in which the construction of the LNG terminal was acknowledged as a strategic investment for the interests of Poland, compliant with the plans for diversification of sources and roads of supply of natural gas and guaranteeing the energy security of the country.